



**Conceptualisation and development of the admin-avatar  
taxonomy: Antecedents, attitudinal and behavioural  
consequences**

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# **Volume One**

## **Abstract**

Academics and practitioners have increasingly acknowledged the significance of the consumer–brand relationship in both traditional and online contexts. However, the impersonal nature of the online environment is considered to be a hindrance in the development of the brand–consumer relationship. The literature suggests that strong relationship outcomes depend on successful relationship marketing tactics. Admin-avatar concept is a new concept -firstly emerged in this research- which can be used as a technological and marketing tactic. Admin-avatar can embody consumer-facing employees and mimic their real-life roles on companies’ websites, thereby playing a key role in enhancing the relationships between consumers and brands in the online environment. Despite the importance of this technology, very little attention has been paid to the investigation of the admin-avatar concept from a marketing perspective. Following a systematic review of the literature found in 10 major electronic databases and published between 1993 and 2013, significant gaps in literature were identified. Specifically, this research examines the nature of the admin-avatar concept, including its main characteristics, dimensions, and conditions as well as the attitudinal and behavioural consequences of admin-avatar users.

Adopting the mixed methods design, a taxonomy was developed from interviews (qualitative phase) which laid the foundation for the development of the admin-avatar framework. Spiggle’s (1994) framework was adopted for the qualitative data analysis. A conceptual framework was developed and built on the theoretical foundations of reasoned action theory (Fishbein & Ajzen, 1975). The admin-avatar framework was empirically tested through a series of lab-based experiments (quantitative phase). Following a confirmatory factor analysis (CFA) was carried out to purify the scales, determine the dimensionality of the constructs and support their convergent and discriminant validity. The

context used for this study was the university admissions admin-avatar. propositions were tested using repeated measures (first experimental design study), factorial design (second experimental design study) and serial mediation techniques for both experimental studies. The results mostly support the taxonomy developed from the qualitative phase.

This thesis contributes to the new technology in marketing and practice, specifically by: (1) providing a clear and comprehensive definition of the admin-avatar concept, (2) developing a comprehensive taxonomy of admin-avatar that enriches the area of new technology in marketing by the further investigations by applying the taxonomy to other contexts (e.g., schools, banks, retailers and other commercial companies), and (3) confirming the notion that the addition of an admin-avatar will transform the consumer attitude towards the website and the brand. Furthermore, the addition of an admin-avatar will prompt consumers to engage in voluntary behaviours such as saying positive things about the organisation/brand (word of mouth) and recommending the brand and its products to other potential consumers (recommendation). In other words, adding the admin-avatar on the brand website will significantly change the attitudes of brand's consumers. These positive attitudes will encourage consumers to do voluntary behaviours for the brand. From a practical perspective, these findings offer practitioners a clearer and richer understanding of the admin-avatar, facilitating appropriate designs for admin-avatar(s). The findings of this research also give practitioners clear insights into the main advantages of the admin-avatar, such as the degree of its convenience (e.g., quickness and effortless), hedonism (excitement) and attractiveness.

‘In the name of Allaah, the Entirely Merciful, the Especially Merciful (1). [All] praise is [due] to Allaah, Lord of the worlds (2), The Entirely Merciful, the Especially Merciful (3), Sovereign of the Day of Recompense (4), It is You we worship and You we ask for help (5). Guide us to the straight path – (6) The path of those upon whom You have bestowed favor, not of those who have evoked [Your] anger or of those who are astray (7).

(Qur’an 1:1-7)

## **Dedication**

This thesis is dedicated to

My father: Hamed Safwat Elsharnouby

Who has inspired me to study hard and given me freedom to take critical decisions regarding my future life since I was young.

Dad you were the best dad ever

May Allah grant you the paradise

My mother: Samia

There are no words that can thank you enough. God bless you!

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Thank you for always being there for me through thick and thin. God bless you all!

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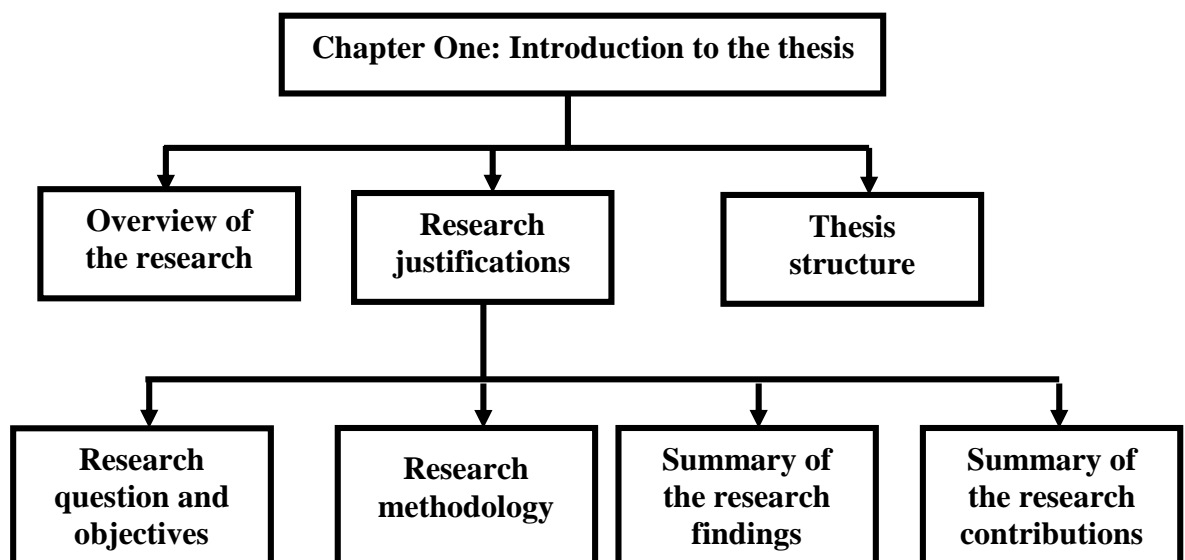
**Chapter One:****Introduction to the thesis****1.1 Introduction**

It has long been believed that human beings love novelty and unique experiences.

(Pearson, 2000)

This thesis explores the admin-avatar concept, including its characteristics, dimensions and consequences. Using the exploratory sequential design, a taxonomy of admin-avatar is developed and the relationships between its constructs are empirically examined.

This chapter aims to set the foundations and pave the way for subsequent chapters. It presents an overview of the research. Following that, the research justifications are provided, showing the formulation of the research question and objectives that reinforce this research, the research methodology, findings and contributions. The final section of this chapter outlines the structure of the thesis, providing a brief overview of each subsequent chapter. Figure 1.1 depicts the Chapter One map.



**Figure 1. 1 Chapter One map**

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**1.2 A personal reflection**

Before I started my PhD journey, I wanted to examine an academically interesting and personally stimulating topic in depth. The main reason behind this search is my belief that the PhD journey is long and includes numerous obstacles. Therefore, choosing an interesting topic would help me overcome the feeling of boredom resulting from the length of the PhD programme while dealing with the expected obstacles to reach the desired goal. In addition, I was looking for a topic which reflected a problem in practice.

At that time, I was observing messages on websites such as Yahoo Messenger and game websites that motivated users to choose their avatars. It started me thinking about the avatar topic and how to link it with business/market issues. When I talked to some of my colleagues about avatars, they were impressed with my ideas; that motivated me to continue my exploration. At the beginning of my PhD programme, I wrote two papers for two prestigious marketing conferences and received very positive feedback about my topic. Since then and even today, I remain enthusiastic about this topic, thinking and working hard to develop it and determine how organisations/brands can benefit from it.

***1.2.1 Overview of the research strands***

This subsection addresses the main strands of research that underpin this study. It begins with the relationships between consumers and brands in the traditional and online environments. Following that, it presents the connective technologies that aim to overcome the barriers of the online relationships. The concept of an avatar as a connective tool is raised for discussion. The final strand discusses a specific type of the avatar concept: the admin-avatar. These strands help to show the importance of the consumer-brand relationships and the changes that have occurred in the relationships nature based on the new technology. This, in turn, shows how the brands think in adopting new tactics/ newest technologies to improve the relationships with their consumers.

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**Consumer–brand relationship.** Consumer–brand relationships have been extensively examined in the literature (e.g., Blackston, & Lebar, 2015; Cheng, White, & Chaplin, 2012; Fournier, 2003; Fournier & Yao, 1997). The significance of consumer–brand relationships has also been acknowledged by practitioners (Sreejesh & Mohapatra, 2013). The deep-rooted relationships between consumers and brands can contribute to achieving strong market shares and profits and facilitating better marketing decisions in relation to the product’s positioning and advertising as well as by underpinning the attitudes and behaviours related to purchases and repeated purchases of the product (Sreejesh & Mohapatra, 2013).

**Consumer–brand relationship in the online environment.** As a result of technological advancements, some interactions between consumers and brands have migrated to online or web-based environments. However, the impersonal nature of the online context is considered one of the main barriers to completing transactions or delivering the product information to consumers, especially where the product in question is complex. Consumers believe that online corporations are impersonal because they feel helpless when engaging in online shopping in unfamiliar or multifaceted product categories. They often want the same consumer assistance found in a traditional shopping environment (Holzwarth, Janiszewski, & Neumann, 2006). Therefore, there is an urgent need to overcome the barriers to creating strong relationships between consumers and their favourite brands.

**Connective technologies.** Recently, scholars and practitioners have investigated how to overcome barriers to online relationships by developing applications, programmes and/or software such as social media and mobile applications for creating connections between brands and consumers. Avatars can be a solution to strengthen online relationships. Computer interfaces can either be embodied — meaning the individual interacts with an animated avatar, sending para-linguistic cues such as gestures and facial expressions to complement or enhance the interface’s message — or disembodied — meaning the human

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interacts through speech or text entered via the keyboard (Breazeal, 2003). The use of avatars in the online context is accelerating greatly and even becoming dominant in the market (Hershfield et al., 2011). This growth is due in part to efforts to provide users with stunning visuals, animations and social communities (Mennecke et al., 2008). Avatars mimic physical human characteristics and actions; for example, the avatar's gaze indicates the direction of looking (Montoya, Massey, & Lockwood, 2011). Avatars are one way that visual information can be added to online communication. For example, Yahoo's avatars demonstrate virtual community members' identities and preferences, along with their postings (Jin et al., 2007; Lee, Kim, & Peng, 2013). Avatars can anthropomorphise the interaction and make the shopping experience more interpersonal (Holzwarth et al., 2006).

**Research on avatars.** Following a systematic literature review in 10 major electronic databases, focusing on texts published between 1993 and 2013, significant gaps in literature were identified. The review explored the lack of research on avatars in general. For instance, the examination of avatars (whether representing consumers or companies) in consumer behaviour and marketing, particularly in commercial contexts, is still in its infancy (Garnier & Poncin, 2013; Poncin & Garnier, 2012). Consumers' increasing demand to create avatars underscores the need for a better understanding of the owners or those behind these avatars (Bélisle & Bodur, 2010). Furthermore, the scope of avatars as online assistants on transactional websites is still limited (McGoldrick, Keeling, & Beatty, 2008). Addressing these gaps led to the current research. Specifically, this research examines the nature of the admin-avatar concept, its main characteristics and aspects, and the attitudinal and behavioural consequences of admin-avatar users.

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**Admin-avatar concept<sup>1</sup>.** The administrative person or employee who does the administrative work in an organisation plays a crucial role in ensuring a smooth workflow. S/he usually deals with different groups of brand/organisation stakeholders, such as consumers, shareholders, government, and managers. Admin-avatars, as a new technology, can embody consumer-facing employees and fulfil their real-life roles on companies' websites. Despite the importance of this technology, very little attention has been paid to the investigation of the admin-avatar concept from a marketing perspective.

Academic research has increasingly considered the degree of connectedness between consumers and brands as a key issue of investigation, particularly in terms of examining the nature and strength of the relationship that consumers develop with brands (Veloutsou & Moutinho, 2009). Recent research on the brand–consumer relationship has emphasised that relationships are highly vibrant entities and can emerge in various forms, in turn yielding concrete benefits —particularly financial gain for the brand in question — for the relationship partners (e.g., Huber, Vollhardt, Matthes, & Vogel, 2010). The literature suggests that strong relationship outcomes depend upon successful relationship marketing tactics (Wulf, Odekerken-Schröder, & Iacobucci, 2001). Thus, it is postulated that the admin-avatar could play a key role in enhancing relationships between consumers and brands in the online environment. The results of serial multiple mediator model showed the influence of each antecedent on word of mouth, recommendation and feedback mediated by the consequences related to the website and brand. Based on these results, the addition of the admin-avatar positively influences all three outcomes.

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<sup>1</sup> The admin-avatar is defined as a three-dimensional animated graphical web interface that represents and imitates the organisation's administrators by providing information and responding to users'/visitors' queries orally and visually.

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### **1.3 Research justification**

#### ***1.3.1 Research question and objectives***

Limited studies have examined the avatar concept in business, particularly in the marketing field. Specifically, the lack of a clear definition and conceptualisation of the admin-avatar concept has been recognised in the literature. Exploring a clear definition of the admin-avatar and investigating its conceptualisation within the consumer research grounded on a theoretical basis are important for providing insights into the admin-avatar concept and opening new avenues for exploring and understanding the consequences of adding an admin-avatar to the brand website. Such research would improve the understanding of the admin-avatar's influence on the consumer's attitudes and behaviours towards the brand. Therefore, the research question investigated in the thesis is: How do consumers interact with the admin-avatar concept?

To answer this research question, four main research objectives were developed, as follows:

1. To introduce the admin-avatar concept and its characteristics.
2. To illustrate the main dimensions of the admin-avatar concept and the main conditions related to the admin-avatar and its users.
3. To explore consumers' main attitudinal and behavioural consequences resulting from adding the admin-avatar to the brand website.
4. To examine the influence of admin-avatar dimensions and conditions on the attitudinal and behavioural consequences of the users.

#### ***1.3.2 Research methodology***

A mixed method approach was adopted to fulfil the research objectives. Specifically, the exploratory sequential model was used; it included two main phases. The steps of this model, as defined by Creswell and Clark (2011), were followed. The first phase was the qualitative phase. In-depth interviews were used in this phase to collect qualitative data



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which were analysed using Spiggle's (1994) framework. Based on the results of the qualitative phase, the second phase, the quantitative phase, was conducted. During this phase, laboratory experiments were used to collect quantitative data. Two experimental design studies were conducted to examine parts of the taxonomy which emerged in the first phase. Each study had its own framework to examine different conditions of the admin-avatar (manipulated variables) and the influence of the admin-avatar dimensions on consumers' behaviours mediated by consequences related to the website and to the brand.

Both phases of the research involved using cross-sectional research design to examine the effects of the admin-avatar on consumers' attitudes and behaviours. The qualitative phase included 42 interviews (30 exploratory and 12 in-depth interviews), and the resulting data were analysed using Spiggle's (1994) framework. Phase two included two independent experimental studies. In the first experimental study, using a within-subject design (repeated measures), 111 completed responses from 37 participants (3 responses per participant) were collected and analysed using confirmatory factor analysis, a comprehensive confirmatory factor analysis marker variable technique, repeated measures and the serial multiple mediator model. Confirmatory factor analysis was utilised showing the measurement model's fit and assessing the composite reliability as well as convergent and discriminant validity of each construct. The comprehensive confirmatory factor analysis marker variable technique (Williams et al., 2010) was adopted to demonstrate whether the common method bias is a likely contaminant of both loading and correlation estimates results or not. Repeated measures analysis was used to show whether significant differences existed among the manipulated variables exposed to the participants or not. Finally, the serial multiple mediator model was used to show the causal effects among mediators in antecedents' influence on the outcomes. In the second experimental study, using a between-group design (factorial design), 135 completed responses from participants in the four conditions (2 (admin-avatar vs. admin-avatar based on text) X 2 (language: English vs. own language))

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were collected and analysed using confirmatory factor analysis, a comprehensive confirmatory factor analysis marker variable technique, factorial analysis, the serial multiple mediator model and the simple moderator model.

### ***1.3.3 Summary of the research findings***

The research explored and examined the admin-avatar concept. By integrating the research findings based on a series of qualitative and quantitative analyses, a comprehensive definition of admin-avatar emerged: ‘a three-dimensional animated graphical web interface that represents and imitates the organisation administrator by providing information and responding to queries through websites both orally and visually’. A taxonomy of the admin-avatar concept was also determined, including the four main admin-avatar dimensions (anthropomorphism, ease of use, admin-avatar efficacy, communication), conditions (conditions related to the admin-avatar itself and conditions related to the user), consequences related to the website (e.g., hedonic characteristics, social presence, usefulness, ease of using the website and attitudes towards the website) and consequences related to the brand (e.g., pride, attitudes towards brand, potential to join and word of mouth). Two experimental studies were conducted, leading to some important results. For example, the results of first experimental study, with respect to the admin-avatar dimensions, showed that the degree of clarity, control, competence, assistance and convenience was not significantly affected by the conditions of providing information (admin-avatar, admin-avatar based on text or written information). However, the communication construct was significantly affected by the conditions of providing information. The written information style was significantly higher regarding communication compared to the presence of admin-avatar. In terms of the consequences related to the website, the results showed that the student’s perception of hedonic characteristics, recall information, usefulness and attitude towards the website was significantly affected by the conditions of providing information. In addition, the three

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constructs of attitude towards the website were significantly affected by the provided information condition type. However, the students' perception of ease-of-use construct was not significantly affected by the conditions of providing information. For the consequences related to the brand, the results showed that only students' perception for attitude towards brand was significantly affected by the conditions of providing information. In addition, the three first constructs of the attitude towards brand were significantly affected by the provided information conditions. However, the students' pride, potential to join and propensity to leave constructs were not significantly affected by the conditions of providing information. The serial multiple mediator model showed that the consequences related to the website and brand mediated the relationships between the admin-avatar dimensions (clarity, control, assistance, convenience, competence and communication) and outcome (potential to join brand).

The results of the second experimental study showed that there was a significant main effect of the admin-avatar condition on the anthropomorphism of the admin-avatar. In addition, there was a significant main effect of the admin-avatar language on the familiarity with the admin-avatar. A significant interaction effect was identified between the admin-avatar condition and the admin-avatar's language on the convenience construct, indicating that the admin-avatar condition was affected differently by the language used. For the consequences related to the website, there was a significant main effect of the admin-avatar condition on the recall information. In addition, there was a significant main effect of the admin-avatar condition on the attitude towards the website — in particular, the likeability construct. A significant main effect was found for the language used on the ease of using the website. For the consequences related to the brand, there was a significant main effect of the admin-avatar condition on the attitude towards brand construct. In addition, there was a significant main effect of the admin-avatar condition on the recommendation construct. There was a

significant interaction effect between the admin-avatar condition and the admin-avatar's language on the word of mouth, recommendation and feedback constructs.

### *1.3.4 Summary of the research contributions*

The research contributions are twofold. The research contributes on the theoretical and practical levels, as follows.

#### **Theoretical contributions**

According to Corley and Gioia (2011), the contributions of research can be determined through two main dimensions: originality and utility. The originality can be categorised into two groups or levels: (1) advancing the understanding incrementally and (2) advancing understanding by providing some types of revelation. Furthermore, utility is divided into (1) practically useful and (2) scientifically useful. This classification can produce the following matrix (Figure 1.2):

	Revelatory	4	1
Originality			
	Incremental	3	2
		Practically useful	Scientifically useful
		Utility	

**Figure 1. 2 Current dimension for theoretical contribution (Corley & Gioia, 2011)**

Based on Corley and Gioia's (2011) conclusions, the current study offers original revelatory insights to brand literature by providing a new comprehensive definition of the admin-avatar that shows its meaning, characteristics and role it can play on the website. To the best of the

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author's knowledge, this research is the first to explore the admin-avatar concept comprehensively. Following the exploratory phase, a taxonomy of the admin-avatar, called the admin-avatar tower, was developed to show how to build strong relationships between students/consumers and the brand by adopting new advanced technology such as the admin-avatar. The taxonomy defines different stages, beginning with how to create a successful admin-avatar to increase the chance of consumers joining the brand and engaging in voluntary behaviours to favour the brand in the end. The taxonomy can be considered a first step in building an admin-avatar theory that further studies can empirically examine and/or use to qualitatively and quantitatively investigate the admin-avatar concept in other contexts in order to reach the final boundaries or frame of the theory. This research also advances extant research on the admin-avatar concept in the marketing literature by providing a clearer picture of the admin-avatar construct and defining its dimensions and theoretical foundation of conceptualisation. Therefore, based on Corley and Gioia's (2011) study, this research provides original incremental insights to existing research on the avatar, particularly the brand admin-avatar. A part of the conceptualisation is empirically confirmed through the experiments showing the influence of the admin-avatar dimensions of the attitudinal and behavioural consequences. Finally, in line with Corley and Gioia (2011), this research presents its scientific usefulness by developing a comprehensive taxonomy of the admin-avatar guided by theories (e.g., reasoned action theory) suitable for the brand context which will motivate scholars to test the theory in the future. The experimental studies in this research confirmed the influence of admin-avatar dimensions on consumers' behaviours, such as the potential to join the brand through mediators, whether related to the website or the brands.

### **Practical contributions**

According to Corley and Gioia (2011), research has practical utility when it can be directly applied to the problems that executives, managers and/or other employees face. Given that

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building strong relationships with consumers is one of the key marketing priorities for most brands, managers and practitioners have benefitted or received value from the new knowledge of developing relationships based on the admin-avatar concept. The current research offers managers with a deeper understanding of the admin-avatar concept as well as its characteristics (e.g visual, auditory and human characteristics), roles and dimensions. A clear understanding of the admin-avatar concept helps managers develop correct plans for appropriate designs of the admin-avatar on their websites. It enables them to identify unique characteristics clearly, such as incorporating the main human characteristics. Taking such characteristics into consideration helps the managers and their employees to understand the philosophy behind creating the admin-avatar as a ‘real-life imitation’. The qualitative results supported by the quantitative results identify the main dimensions of the admin-avatar; these can be compared other styles and tools, such as written information and video. These dimensions can guide managers and give them deep insights into the main advantages of the admin-avatar that they should focus on and highlight to their users. In addition, they also guide the managers in determining the main defects of the admin-avatar so they can work hard to find appropriate solutions. Furthermore, the results give managers more insights about the roles that the admin-avatar can play on a website such as guidance, instructor and respondent to any inquiries. Finally, the results of the admin-avatar research can help managers adopt effective strategies for effective communication, particularly with respect to the type of information and length of the messages. The brand should also develop its admin-avatar continually to remain informative on all topics it presents. This action requires the practitioners to be continuously aware about the consumers’ opinions with respect to the messages of admin-avatar and their extra needs for the required information.

#### **1.4 Organisation and structure of the thesis**

The organisation of this thesis is in line with the adopted mixed method exploratory sequential design developed by Creswell and Clark (2011), as shown in Figure 1.2. The

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thesis comprises 11 chapters. The first chapter, the current chapter, introduces the thesis. It presents an overview of the research and shows the justifications of choosing this research by pointing out the gaps in extant studies and presenting potential contributions. Following this chapter, three literature review chapters are presented: Visualising the avatar concept in the business and marketing disciplines: An author co-citation analysis (1993–2013) (Chapter Two), Theoretical foundations of the avatar concept (Chapter Three), and Variables linked by avatars (Chapter Four). Chapter Two provides a comprehensive review by adopting systematic literature review techniques to (1) compare the application of the avatar concept in different academic disciplines, (2) take a closer look at current studies in the business (excluding marketing) and marketing disciplines, and (3) help identify the important studies and the influential scholars as well as the linkages among them by using author co-citation analysis (ACA). Chapter Three provides a review of concepts similar to the avatar and analyses the selected studies to show the definitions, similarities, differences and characteristics in order to build the theoretical background of the avatar concept. Chapter Four examines the selected studies identified in Chapter Two and Three to highlight the variables linked with avatars and determine the research gap(s). Chapter Five, Research methodology and data collection, presents the philosophical position of the research design. Thus, the research follows an exploratory sequential design including two main phases: qualitative (data are collected through in-depth interviews) and quantitative (laboratory experiments). The analysis methods employed include qualitative data analysis based on Spiggle's (1994) framework, and the quantitative data analysis based on confirmatory factor analysis (CFA), convergent validity, reliability, discriminant validity and common method bias (CMB or CMV), repeated measures, factorial design ANOVA, the serial multiple mediator model and the simple moderation model.

The thesis includes four data analysis chapters: Chapters Six and Seven provide the qualitative data analysis and Chapters Eight and Nine present the quantitative data analysis.

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Chapter Six presents the analysis and results of the first part of the qualitative phase. It aims to provide (1) an appropriate definition of the admin-avatar concept and its main characteristics, (2) the main dimensions of the admin-avatar, and (3) the main conditions related to the admin-avatar as a tool on websites and its users. Chapter Seven presents the second part of the qualitative data analysis and results. It aims to show the main consequences of using the admin-avatar, including attitudinal and behavioural consequences. It also shows the taxonomy emerged from the qualitative data analysis and identifies the conceptual frameworks to be empirically examined in Chapters Eight and Nine (parts of the taxonomy; the rest will be examined in future research).

Chapter Eight aims to show the experimental design for the first study and its objectives. The main objective of this study is to compare three conditions of providing information to the website visitors (e.g., students): written information style (as a control condition or variable), admin-avatar, and admin-avatar based on text (manipulated variables). It further aims to examine the impact of different dimensions of each condition on consequences related to the website and the brand.

In addition, Chapter Eight analyses the collected data and the main results using a preliminary data analysis, CFA, convergent validity, composite reliability, and CMB. In addition, the propositions are tested using two main techniques: repeated measure ANOVA and the serial multiple mediator model. Chapter Nine presents the objective and design of the second experimental study which aims to examine whether the effect of the admin-avatar condition (based on text or not) and its language significantly differ on the different dimensions as well as users' attitudes and behaviours. It also aims to examine the impact of the different dimensions on the consumers' behaviours mediated by consequences related to the website and the brand. Finally, it examines whether familiarity with the admin-avatar moderates the relationships between the different dimensions and consequences related to



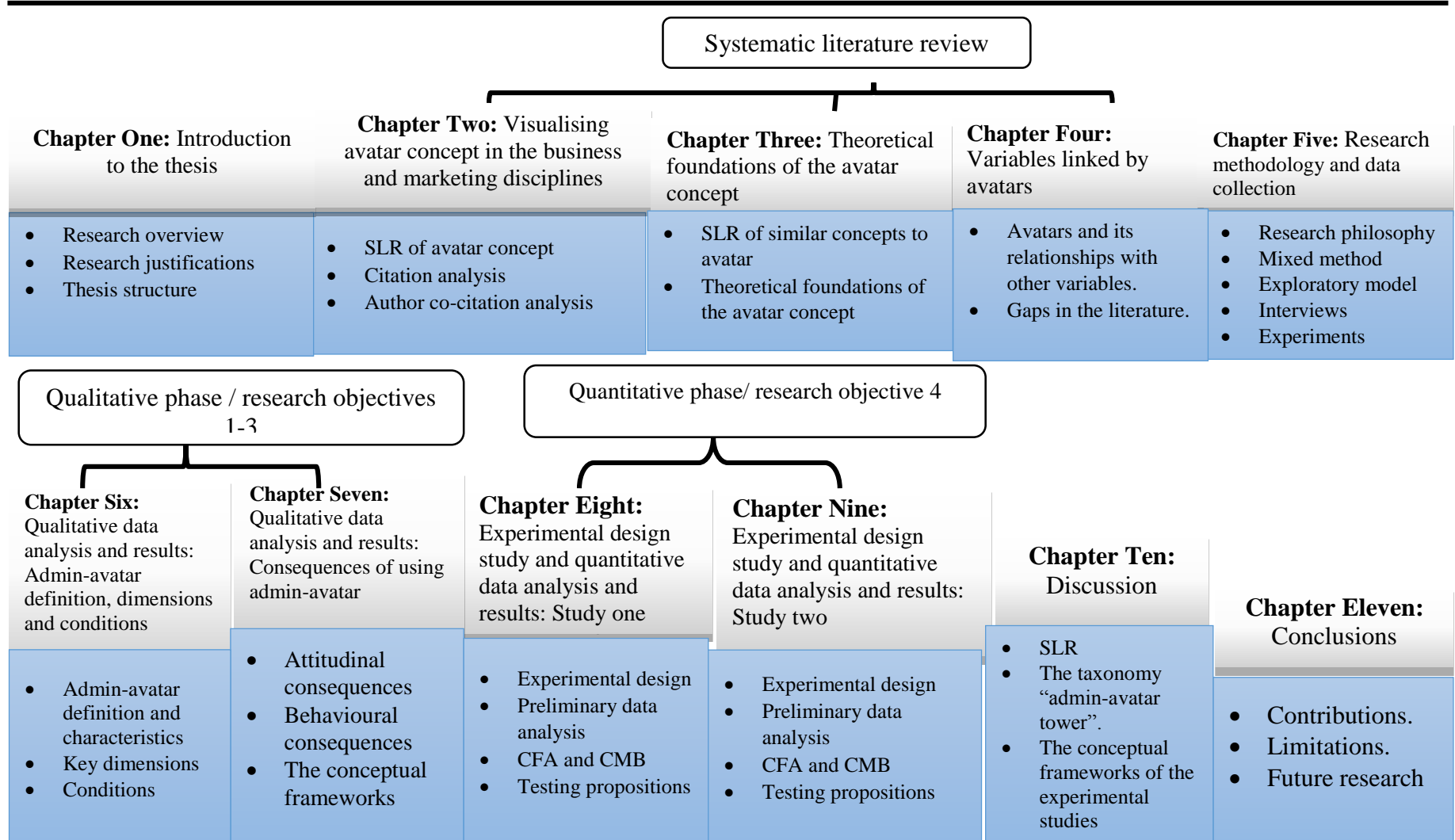


Figure 1. 3 Thesis structure

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website. The chapter presents the analysis of data collected from these experiments and the main results.

Chapter Ten, Discussion, discusses the main findings of the systematic literature review with respect to the current studies addressing the avatar concept, particularly its current definitions, and compares them with the comprehensive definition of the admin-avatar concept. It then offers a discussion on the taxonomy of the admin-avatar tower developed from the qualitative phase in light with the current conceptualisations of avatar in the literature. With the conceptual frameworks taken from the emerged taxonomy, the final section focuses on the outcomes of the two experimental studies in relation to the qualitative results. Finally, Chapter Eleven, Conclusion, summarises the research by highlighting the different levels of contributions, including the theoretical and practical contributions. It also presents the limitations of the research and offers directions for future research.

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## **Chapter Two: Visualising the avatar concept in the business and marketing disciplines: An author co-citation analysis (1993–2013)**

### **2.1 Introduction**

The purpose of the first three chapters of the thesis is to review the pertinent literature relating to the concept of avatar, predominantly from business and marketing perspectives. This chapter takes a comprehensive review on the avatar concept studies as a new connective tool to develop the relationships between brands and their consumers. This systematic review of literature published between 1993 and 2013<sup>2</sup>, specifically aims to (1) compare the application of the avatar concept in different academic disciplines, (2) take a closer look at current studies in the business (excluded marketing) and marketing disciplines, and (3) help identify the important studies and influential scholars as well as the linkages among them by using author co-citation analysis (ACA). To achieve these objectives, this chapter is divided into four main sections (see Figure 2.1): comparisons among different disciplines, detailed bibliometric investigations in business and marketing disciplines, developing the intellectual structure of avatar concept, and discussion.

### **2.2 Comparisons of avatar between different disciplines**

This section compares different academic disciplines to show the application of the avatar concept studies across these disciplines. The comparison adopts the systematic literature review approach because it attempts to overcome the deficiencies in the traditional review methods by applying the same standards to secondary research which should be applied to primary research (Davies & Crombie, 1998). It uses rigorous scientific investigations and procedures that limit

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<sup>2</sup> The reasons for this are twofold. First, this was initially written as a journal submission in 2014. Second, at the time of submission of the thesis in 2015, the author was allowed an extension of only one month; as such, updating the entire systematic review to take into account 2014 publications was not feasible.

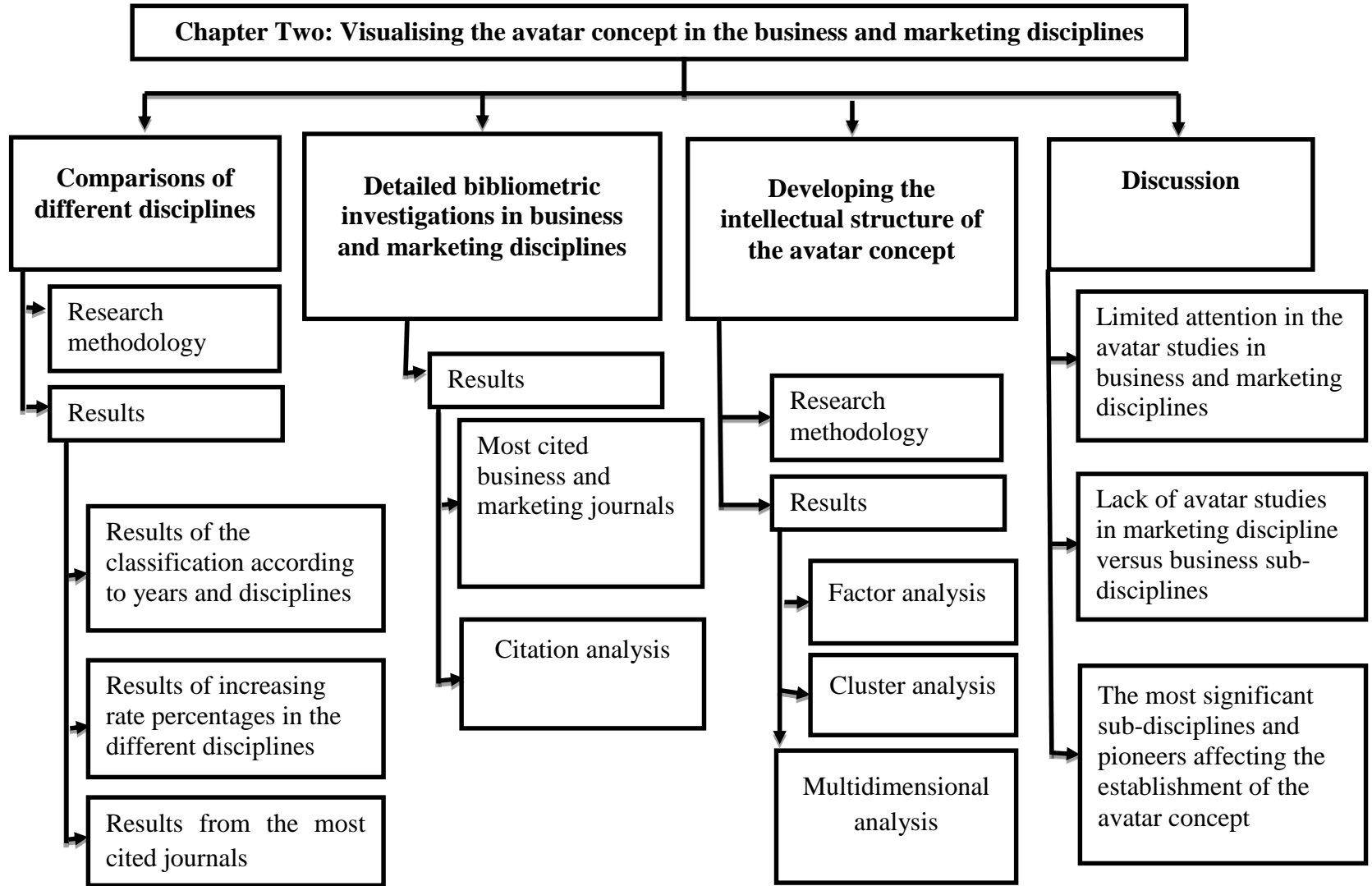


Figure 2. 1 Chapter Two map

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bias and random error (Cook, Greengold, Ellrodt, & Weingarten, 1997; Denyer & Neely, 2004). In addition, the findings of the systematic literature reviews are motivated by the prospect of showing to what extent the avatar concept is prevalent in the business and marketing literature.

### ***2.1.1 Research methodology***

It is important to highlight the methodology adopted in systematic literature reviews. The review strategy adopted here includes a number of steps designed to provide a systematic and explicit review (Pittaway, Robertson, Munir, Denyer, & Neely, 2004). It is important to state that the search was conducted between January and February 2014. The following steps were taken into consideration in the search strategy of this study:

- (1) The keywords on the topic of avatar focused on avatar conceptualisation. These keywords included ‘avatar definition’, ‘avatar refers’, ‘avatars refer’, ‘avatar is’, ‘avatars are’ and ‘avatar concept’.
- (2) These keywords were constructed using a root search string. For instance, this type of search (avatar is AND avatars are OR avatar defin\* OR avatar refer\* OR avatar concept\*) was used as a secondary method for developing a comprehensive picture on the avatar concept.
- (3) Ten bibliographical databases were used in the search in order to have the greatest coverage of the avatar topic: Web of Knowledge/Web of Science, Emerald, ProQuest, Academic Search Premier (EBSCO), Sage Online Journals, JSTOR, IEEEExplore, Scopus, Science Direct and Taylor and Francis (see Appendix A.3).

(4) The review was limited to a range of years (1993–2013) and published journal articles/peer-reviewed citations.<sup>3</sup>

(5) The articles were selected according to the inclusion and exclusion criteria shown in Appendix A.1 and A.2. The databases results — after eliminating duplicates by using Endnote software — identified 2361 published articles, as shown in Table 2.1.

(6) The years were divided into four periods, with first period being included 14 years, the second period includes 4 years, third period 2 years and last period included one year. This classification was used for two reasons. First, as expected, the first years did not have as many articles as later years. Second, this classification makes the explanation of results easier as second period is half the length of time of the first one. The years were divided to show the trends/directions of the number of articles per period. The results of the classification are shown in Table 2.1.

(7) Only articles in business (excluded marketing), psychology, social science and economics ranked in the Association of Business School (ABS, 2010) were chosen. However, all marketing articles were taken into consideration regardless their rank. In the computer science field, the CORE Journals ranking was used to identify the citations chosen for the present study (Nixon, 2014). Finally, SCImago journal and country rank were used (González-Pereira, Guerrero-Bote & Moya-Anegón, 2010) to identify the articles in the communications and arts and humanities fields. In the communications field, only articles graded 3 and 4 were taken into consideration, and only grade 4 was used in the arts and humanities field as these fields used

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<sup>3</sup> This is because the first generation of graphical Web browsers, capable of displaying a document as a page containing elements such as text, pictures, sound, movies and links to other documents or files became available in 1992 (Sotudeh-Gharebagh, 2003).

comparisons with the marketing field and limited the number of citations. This step limited the articles for inclusion to 1327. The results of the elimination process are shown in Table 2.1.

Period	1993-2006	2007-2013	2011-2012	2013	Total
No. of articles	751	771	572	265	2361
No. of articles after taking the rank into consideration	428	429	322	148	1327

**Table 2. 1 Classification of search results according to years**

### 2.1.2 Results

The main results of this section are divided into three subsections: the classification results according to years and disciplines, the increasing rate percentages in the different disciplines and the results of the most cited journals.

#### 2.1.2.1 Classification according to years and disciplines

To simplify the results, the articles were categorised into five discipline categories. As shown in Table 2.2, approximately 54% (715) of the articles were published in computer science journals whereas only 16.65% (221) and 8.14% (108) of articles were published in business and marketing journals, respectively. These percentages show the limited attention focused on the avatar concept in both business and marketing disciplines. In addition, the low rate of articles in both disciplines can be recognised from a number of points. The business discipline includes 14 subfields (see Appendix A.1). All marketing articles in the literature were taken into consideration regardless of their rankings. Although only communications articles graded as 3 or 4 were chosen, they represented 9% (120) of the articles.

Period	1993-2006	2007-2010	2011-2012	2013	Total
Business	66	71	61	23	221
Marketing	18	43	33	14	108
Communication	26	49	31	14	120
Computer science	267	217	147	84	715
Others (social science, psychology, economics, arts and humanities)	51	49	50	13	163
Total	428	429	322	148	1327

**Table 2. 2 Classification of search results according to years and fields**

### 2.1.2.2 Heightened publication rates across disciplines

Table 2.3 indicates that the number of published articles has been increasing across the business, marketing and computer science disciplines. The equation here is as follows: increasing rate (times) = (current average – base average)/base average. All data in Table 2.2 were transformed into averages by dividing each number of articles by the number of years in the period. For instance, 66 articles were published in the business discipline in the first period which included 14 years. Therefore, the average of this period is 66/14 (4.71 articles). Thus, 4.71 articles related to the avatar concept were published per year between 1993 and 2006. Meanwhile, the average in that same discipline was 23 articles (23/1) during the last period (2013). After determining the averages, the first period (1993–2006) was used as the base period for all disciplines. Table 2.3 shows the final results using the previously defined equation. For example, the increasing rate of business discipline in the last period (2013) = (23-4.71)/4.71 = 3.88 times. This means that the number of published articles related to the avatar concept increased in the last period by 3.88 times compared to the first period (base period). Using this mathematical approach can accurately help clarify the positive direction of scholars' attention towards the avatar concept. Business, marketing, computer science, communications and other disciplines observed an increase in the attention rate compared to the first period as a



base period. Although the rate in 2013 decreased in these four categories (compared to the 2011–2012 period), it was still positive. Thus, scholars in these disciplines were interested in examining the avatar concept till 2013 and expected to publish other issues related to this concept in the future (i.e., 2014).

	Period			
	1993-2006	2007- 2010	2011- 2012	2013
Business	-----	2.77	5.48	3.88
Marketing	-----	7.33	11.79	9.85
Computer science	-----	5.59	7.33	6.53
Communication	-----	1.84	2.85	3.4
Others	-----	2.37	5.87	2.57

**Table 2. 3 Increasing rate percentages in three different disciplines**

#### 2.1.2.3 Citation by journals

As in most previous systematic studies, it is important to illustrate the most cited journals publishing articles on the avatar concept. Table 2.4 shows the 25 most often-cited journals, their ranks and disciplines, numbers of articles cited in each journal and the journal's relative frequency. The results revealed 1327 published interdisciplinary articles between 1993 and 2013. The top 25 journals published 778 articles of the total shown in the table. These articles represent approximately 58.63% of the total. The first four most cited journals are *Computer Graphics and Applications* (IEEE), *Visualization and Computer Graphics* (IEEE), *Transactions, digital creativity* and *International Journal of Human-Computer Interaction* which are classified as computer science journals by the CORE journal rankings (2010). These journals accounted for 8.5%, 5.35%, 4.6% and 4.52% of all citations, respectively. *Communications of the ACM*, *MIS Quarterly* and *Journal of Management Information Systems* which were classified as business journals were ranked as the tenth, fourteenth and sixteenth most cited journals, respectively, for the avatar concept. Only one marketing journal — *Journal*

*of Consumer Research* — was ranked within the top 25 journals; it ranked as the eighteenth most influential journal regarding the avatar concept, with 12 published articles.

No	Rank	Cited journal	Discipline	No. of articles	Relative frequency %
1.	1.	Computer Graphics and Applications, IEEE	Computer science	113	8.5
2.	2.	Visualization and Computer Graphics, IEEE Transactions	Computer science	71	5.35
3.	3.	Digital Creativity	Computer science	61	4.6
4.	4.	International Journal of Human-Computer Interaction	Computer science	60	4.52
5.	5.	Information, Communication & Society	Social science	53	4
6.	6.	Computer	Computer science	47	3.54
7.	7.	Computer Graphics Forum	Computer science	45	3.39
8.	8.	Computers in Human Behavior	Computer science	43	3.24
9.	9.	Behaviour & Information Technology	Computer science	34	2.56
10.	10.	Communications of the ACM	Business	33	2.49
11.	11.	Media Psychology	Communication	30	2.26
12.	12.	Computers & Graphics	Computer science	19	1.44
13.	13.	CyberPsychology, Behavior & Social Networking	Psychology	18	1.36
14.	14.	Journal of the Association for Information Systems	Computer science	15	1.13
15.	14.	MIS Quarterly	Business	15	1.13
16.	14.	International Journal of Human Computer Studies	Business	15	1.13
17.	15.	Feminist Media Studies	Communication	14	1.06
18.	16.	Journal of Management Information Systems	Business	13	0.98
19.	17.	Interacting with Computers	Computer science	12	0.90
20.	17.	Cyberpsychology & Behavior	Psychology (other)	12	0.90
21.	18.	Journal of Consumer Research	Marketing	11	0.83
22.	18.	Ergonomics	Psychology	11	0.83

23.	18.	Convergence: The International Journal of Research into New Media Technologies	Communication	11	0.83
24.	18.	Advanced Robotics	Computer science	11	0.83
25.	18.	International Journal of Image & Graphics	Computer science	11	0.83
				778	58.63
26-365		Total		1327	100

**Table 2. 4 Most cited journals**

### **2.3 Detailed bibliometric investigations in business and marketing disciplines**

The second objective in this chapter is to take a closer look at current studies in the business (excluded marketing) and marketing disciplines. In order to achieve this aim, further investigations are needed. These investigations provide more details about the contributions of business and marketing disciplines regarding the avatar concept. In addition, further investigations also display the study (ies) with the most impact on the investigated concept.

#### **2.3.1 Results**

The main results of this section are divided into two subsections focused on the most cited business and marketing journals and the results of the citation analysis.

##### *2.3.1.1 Most cited business and marketing journals*

The results can be used to provide a closer look at published studies in the business and marketing disciplines. The most frequently cited business and marketing journals are presented in Table 2.5. The top 25 journals represent only 15.45% (205) of all the articles. Marketing journals contributed only 4.44% of the total number of avatar concept studies, whereas business journals accounted for 11% of the total. These results show the weak contribution of the marketing field to the avatar concept.

No	Rank	Business and marketing cited journals	Discipline	No. of articles	Relative frequency %
1.	1	Communications of the ACM	Business	33	2.49
2.	2	Information Systems Management	Business	16	1.21
3.	3	MIS Quarterly	Business	15	1.13
4.	3	International Journal of Human Computer Studies	Business	15	1.13
5.	4	Journal of Management Information Systems	Business	13	0.98
6.	5	Journal of Consumer Research	Marketing	11	0.83
7.	6	Advances in Consumer Research	Marketing	8	0.60
8.	6.	Expert Systems with Applications	Business	8	0.60
9.	7.	Journal of Advertising	Marketing	7	0.53
10.	7.	Communications of the Association for Information Systems	Business	7	0.53
11.	8	International Journal of Market Research	Marketing	6	0.45
12.	8.	Journal of Marketing Management	Marketing	6	0.45
13.	8.	Information Systems Research	Business	6	0.45
14.	8.	International Journal of Electronic Commerce	Business	6	0.45
15.	8.	British Journal of Guidance & Counselling	Business	6	0.45
16.	9.	Journal of Research in Interactive Marketing	Marketing	5	0.38
17.	9.	foresight	Business	5	0.38
18.	10.	Journal of Brand Management	Marketing	4	0.30
19.	10.	Journal of Marketing	Marketing	4	0.30
20.	10.	Journal of Interactive Advertising	Marketing	4	0.30
21.	10.	Journal of Consumer Marketing	Marketing	4	0.30
22.	10.	Decision Sciences	Business	4	0.30
23.	10.	Journal of Computer Information Systems	Business	4	0.30
24.	10.	Journal of Service Management	Business	4	0.30
25.	10.	Management Decision	Business	4	0.30
				205	15.44
26-103		Total		1327	100

**Table 2. 5 Most cited business and marketing journals**

### 2.3.1.2 Citation analysis

A citation analysis is an important indicator for identifying the research that made the greatest impact on the topic/concept being examined (Coombes & Nicholson, 2013). Table 2.6 shows that 1327 articles published between 1993 and 2013 mentioned the concept of avatar. The time

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frame was divided into four periods to achieve the longitudinal study of the evolution of concept literature (Coombes & Nicholson, 2013). The first period (between 1993 and 2006) included 14 years (66.67% of total years studied) but only 428 published articles (32.25% of all articles). However, the second three periods (between 2007 and 2010, between 2011 and 2012, and 2013) included only 7 years (22.6) but 899 published articles (67.75% of all articles). The second part of Table 2.6 shows the number of articles in three categories per period. The number of analysed articles refers to all business and marketing categories. This process resulted in 329 articles for analysis. Based on the criteria mentioned in Appendix A.4., the analysed articles were categorised into three groups (highly relevant, less relevant and not relevant). It should be noted that this process was not adopted from the beginning of study as it was difficult to categorise all these article due to time constraints. However, this approach did not influence the findings in a detrimental manner. The third part of the table shows the results of this process: 130 articles were highly related, 137 articles were less related and 62 articles were not related.

The investigations of cited in process (intellectual structure in the next section) and cited out process (parts four and five in Table 2.6) were conducted based on the highly relevant articles. The fourth part in the table depicts the total number of articles citing these highly relevant articles. For instance, the first period (1993–2006) included 711 references that cited out the 34 highly relevant articles in the same period. In addition, between 2007 and 2010, only 273 references were cited out of the 41 journal articles. A declining trend was observed in the citations among the four periods. This reduction can be explained by the fact that recently published articles have had less time to be cited by other authors (Coombes & Nicholson, 2013). All references were investigated and categorised into three groups: marketing journals, business journals and other journals. The investigation found that 28.75% of the references cited out of

journal articles by other scholars during the four periods appeared in business journals, compared to 14.29% in marketing journals.

	1993- 2006	2007- 2010	2011- 2012	2013	Total	%
Number of avatar articles published	428	429	322	148	1327	100
Articles in database						
Marketing articles	18	43	33	14	108	8.14
Business articles	66	71	61	23	221	16.65
Other articles	344	315	228	111	998	75.21
Number of analysed articles	84	114	94	37	329	
Relevance of analysed articles						
High relevant	34	41	41	14	130	39.51
Less relevant	36	53	36	12	137	41.64
Not relevant	14	20	17	11	62	18.85
Cited out						
Number of analysed references cited out of journals (high relevant business and marketing)	711	273	98	17	1099	100
References in database						
Marketing journals	89	46	19	3	157	14.29
Business journals	138	122	52	4	316	28.75
Other journals	484	105	27	10	626	56.96

**Table 2. 6 Data set**

#### **2.4 Developing the intellectual structure of avatar concept**

The last objective in this chapter is to identify the important studies of the avatar concept and the influential scholars as well as the links among them. According to Eom (2009), author citation analysis (ACA) is often used to determine most influential scholars, publications, in a particular discipline over a period of time from a particular set of documents. It is also the principal bibliometric tools in establishing relationships among scholars writing on a particular topic. It can thus identify subspecialties and how closely each subgroup is related to each of the other subgroups. By establishing relationships among scholars, ACA provides a basis for

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understanding the intellectual structure of literature and defining the principal subject (major area of subspecialties and their contributing disciplines) through the empirical consensus of numerous authors. Therefore, the appropriate approach for achieving the last objective of this chapter is to use the ACA. This approach is also beneficial to the current research as it will be able to identify the influential scholars and their disciplines/ subspecialties supporting the claim that there is a gap in the marketing literature investigating avatars.

Bibliometric approaches have been used in the business and marketing research (e.g., Tseng, Tung, & Duan, 2010). For instance, Culnan (1987) mapped the intellectual structure of management information systems (1980–1985). Ramos-Rodriguez and Ruiz-Navarro (2004) and Nerur, Rasheed, and Natarajan (2008) investigated the intellectual structure of the strategic management field by conducting co-citation analysis. Tseng et al. (2010) explored and mapped the intellectual structure of leadership research whereas Shiau and Dwivedi (2013) identified the core and emerging knowledge in electronic commerce research. However, limited research bibliometric approaches — the ACA approach in particular — has been published in the marketing discipline. For example, Galvagno (2011) reviewed the literature to explore the structure of the anti-consumption and consumer resistance topic.

#### ***2.4.1 Research methodology***

As previously mentioned, only business articles ranked in the Association of Business School (ABS, 2010) were targeted. In contrast, all marketing articles which mentioned the avatar concept were selected. The number of selected articles in business and marketing categories was 221 and 108, respectively. Of the remaining 329 articles, a further set of exclusion criteria were applied to capture the most influential work. These articles were divided into three categories (i.e., highly relevant, less relevant and not relevant) based upon the relevancy of analysed articles to the objectives of the current study (shown in Appendix A.4). This process

limited the number of articles to 130. These articles were used to develop the intellectual structure of the avatar topic in next section.

Developing the intellectual structure of the avatar concept in order to identify the important studies and influential scholars as well as the links among them requires different procedures. The ACA is a bibliometric technique that has found widespread applicability for investigating different concepts (Nerur et al., 2008). It includes ‘the assembling and interpretation of bibliographical statistics taken from the cited references which are taken from the selected citing articles’ (Eom, 2009, p. 144). According to this thought, six different steps of the ACA can be adapted as follows:

Step1: Selection of authors (Subjective approach or objective approach — an initial list of authors — finalising the author set).

Step2: Generation/compilation of co-citation frequencies among the scholars selected in Step 1.

Step3: Input data (co-citation matrix) preparation: this step includes developing an initial co-citation matrix, then transforming it into the transposed co-citation matrix. The later matrix is considered an SPSS input file for the factor analysis, cluster analysis and multi-dimensional scaling analysis.

Step 4: Multivariate analysis of correlation matrix: the transposed co-citation matrix is analysed to result in a correlation matrix as an initial stage of multivariate analysis: factor analysis (factor structure analysis and factor correlation analysis), cluster analysis and multidimensional scaling (two-dimensional MDS and three-dimensional MDS).



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Step 5: Output preparation: important outputs of the multivariate analysis are rotated factor pattern tables, factor structure correlation tables, inter-factor correlation tables, dendrogram, two-dimensional MDS graph and three-dimensional MDS graph.

Step 6: Validation and interpretation: this final step includes statistical validation, consultation with field specialists and interpretation based on the researcher's judgment.

**Author selection:** According to Eom (2009), two main approaches are used to identify the selected authors: the subjective approach and the objective approach. In the subjective approach, a predefined list of authors can be collected in different ways, such as personal knowledge, surveys, organisational membership, and lists of awards. Although widely used in previous studies, the main weakness of this approach is that it may often fail to identify emerging authors in the given academic disciplines. In contrast, the objective approach does not need a predetermined list of scholars at all. However, it is very difficult to apply this approach to commercial databases, such as the Social Sciences Citation Index, because of the size of the databases and high costs. Selecting a list of authors for further analysis through a completely custom-built database can avoid these problems; in addition, emerging scholars are more likely to be included in the selection process.

The objective approach was adopted as there is no predetermined list of scholars. Based on the selected articles (130 highly relevant articles), a list of authors was prepared for further analysis. Table 2.7 summarises all the cited articles (130 highly relevant articles in this study) and citing articles (references included in the cited articles) according to the five periods. Ultimately, 6771 citing articles (references) were counted to examine them in order to identify the list of authors. It is important recognise that the term *author* in the co-citation analysis refers to a body of writings by a person (Eom, 2009).

	1993- 2006	2007- 2010	2011- 2012	2013	Total
Number of cited articles	34	41	41	14	130
Number of citing articles	861	2271	2617	1022	6771

**Table 2. 7 Numbers of cited and citing articles**

**Author list:** The researcher manually examined all 6771 references to generate the author list. Two main things were taken into consideration: the author should have at least two works on the avatar concept, and self-citations were eliminated (e.g., Eom, 2009). The results of this step are shown in Appendix A.5. 37 authors, 68 authors, 48 authors and 50 authors were identified in the four periods, respectively. These four lists were used to create the co-citation matrices as an input of the multivariate analysis.

**Co-citation matrix:** Having identified the list of authors, a co-citation matrix per period was developed. Two types of values were identified: diagonal cell values and off-diagonal cell values. The diagonal cell values refer to ‘the co-citation frequency counts between the author himself/herself excluding self-citation’, whereas ‘the off-diagonal cell value is the total number of the co-citation count between these two authors’ (Eom, 2009, pp. 151–152). First, the diagonal cell values were counted. According to Eom (2009), counting the diagonal values of the author manually is the best way to examine the references of each citing article. However, examining all the citing articles’ references one by one would be an extremely time-consuming procedure and virtually impossible when using ISI databases. It is applicable in the case of using custom databases, but still an extremely time-consuming task. Furthermore, as this approach is considered complicated, ACA researchers can use one of six alternative approaches to fill the diagonal cells when a co-citation counts matrix is missing values: the mean co-citation count for each author approach, zero approach, highest off-diagonal co-citation counts approach, three highest off-diagonal values divided by two approach, and raw co-citation

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approach. The first approach was adapted as the four matrices were generated manually to provide accurate data for and an appropriate picture of the analysis. In addition, the cited articles are not very large and could capture all the citing articles. Second, after all diagonal cell values were counted, all the off-diagonal cell values were manually counted as well. Appendix A.6 shows a sample of generating a co-citation matrix after filling both diagonal and off-diagonal cell values. This matrix belongs to the second period (1993–2006). The subsequent three matrices were also generated using the same approach.

**Transposed co-citation matrix:** As SPSS was used to analyse the data (multivariate statistical techniques), the co-citation matrix was converted into a transposed co-citation matrix because SPSS does not recognise triangle-shaped data. Appendix A.7 shows a sample of converting a co-citation matrix into a transposed co-citation matrix. This matrix belongs to the second period (1993–2006). These matrices, generated in Excel, were imported into the SPSS programme to analyse the data.

**Multivariate analysis procedures:** Three multivariate statistical procedures (factor analysis, cluster and multidimensional scaling techniques) were used in this study as these are common in the ACA research (e.g., Eom, 2009; McCain, 1990). The three techniques in the ACA were used to classify all variables (authors) into several subgroups with common underlying hidden structures and/or characteristics. The terms of these characteristics differ based upon the technique used. For example, they are called factors in factor analysis, clusters in cluster analysis, and dimensions in the multidimensional scaling technique. Although all three techniques seek to simplify a large number of variables, each technique has different outputs which are explained in detail below (Eom, 2009). The transposed co-citation matrix is considered one of the necessary inputs to carry out these procedures.

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**Factor procedures (principal component analysis):** Component analysis is used to condense the most variables (authors) to a minimum number of factors as the primary concern of this technique is to reduce the data/variables (Hair, Black, Babin, & Anderson, 2010; Tabachnick & Fidell, 1996). Each variable is viewed as a dependent variable which is a function of a set of underlying factors (Eom, 2009). Factor loadings represent the correlations between the original variables and the latent factors and are important for understanding the nature of a specific factor, whereas an eigenvalue/latent root represents the amount of variance accounted for by a factor (Eom, 2009; Hair et al., 2010). The total variation is used to determine the relationships between the variables in each factor; a high percentage variance refers to a high degree of relationships among the variables with significant loadings (Eom, 2009). The factors are ordered so that the first factor extracts the most variance and the last factor has the least variance (Tabachnick & Fidell, 1996).

Factor procedures generate three main outputs/derived solutions — namely, a rotated factor pattern, factor structure correlation, and inter-factor correlation — to make the solution more interpretable (Eom, 2009). To generate these outputs, the Promax rotation was specified as an oblique method in the SPSS. In contrast to the orthogonal rotation method, oblique rotation is applied when there are high degrees of correlation among the factors (Eom, 2009). In other words, as factors in the ACA are highly correlated to one another, most ACA researchers prefer to use the oblique rotation method to produce factor structure correlations. In addition, the factor analysis also reveals which scholars have a pervasive influence on the field as those authors would appear in more than one subfield (Nerur et al., 2008).

**Cluster procedures:** Cluster analysis aims to discover groups in data-using methods that construct rules for classifying new individuals into one or another of the known groups (Everitt, Landau, Leese, & Stahl, 2011). In ACA, the main purpose of this technique is to create an

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empirical map of authors in an academic discipline by combining all individual authors into one final cluster (Eom, 2009). Two different clustering algorithms are used: hierarchical and nonhierarchical (Eom, 2009). Hierarchical clustering techniques are divided into agglomerative and divisive methods. Agglomerative methods proceed with a set of successive fusions of the  $n$  individuals into groups whereas divisive methods separate the  $n$  individuals successively into finer groupings (Everitt et al., 2011). ACA researchers commonly use the agglomerative hierarchical clustering procedure (Eom, 2009). It is a suitable method when a correlation matrix, as a proximity measure, is used as an input to the cluster analysis (e.g., Eom, 2009; Everitt et al., 2011; McCain, 1990). Using agglomerative hierarchical techniques ultimately reduces the data to a single cluster containing all the variables (Everitt et al., 2011).

Cluster procedures produce a cluster history and dendrogram (tree graph) to assess how the intellectual structure of the academic discipline has been developed or how each author contributed in the development and evolution of this discipline (Eom, 2009; Eom & Farris, 1996). The dendrogram is defined as a two-dimensional and mathematical representation of the complete clustering procedure (Everitt et al., 2011). Most researchers using agglomerative clustering display their results by means of dendrograms. There are two main types of dendrograms. The first type is most familiar and is read from left to right, and the labels are listed only once in the column on the left. The second type is very similar, but the vertical line specifying each cluster extends through all its objects (Kaufman & Rousseeuw, 2005).

**Multidimensional scaling procedures:** Multidimensional scaling (MDS) techniques are used for four purposes: They (1) represent similarity/dissimilarity data as distances in a low-dimensional space in order to make these data accessible to visual inspection and exploration; (2) allow researchers to test whether and how certain criteria can distinguish among different objects of interest mirrored in the corresponding empirical differences of these objects; (3)

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allow one to discover the dimensions that underlie judgments of (dis)similarity; and (4) explain judgments of dissimilarity in terms of a rule that mimics a particular type of distance function (Borg & Groenen, 2005). The most appropriate aim of MDS in our study is to construct a geometric representation of data or applications for displaying clusters in a Euclidian space (Eom, 2009; Everitt et al., 2011). In ACA, it is a class of multivariate statistical techniques that creates an empirical map of authors in an academic discipline. MDS procedures result in two-dimensional plots and annotated three-dimensional scatter diagrams/maps. On a MDS map, authors whose works are co-cited together are frequently mapped closely, and the higher co-citation frequency is translated into a shorter distance between the co-cited authors (Eom, 2009).

### **2.4.2 Results**

The results of this section help achieve the third objective. These results are shown based on the three statistical techniques used: factor analysis, cluster analysis and multidimensional scaling. The results of each technique are divided according to four periods.

#### *2.4.2.1 Factor analysis*

The results of the factor analyses help yield many insights into the evolution of the intellectual structure of the avatar concept. The results are discussed based on the classification of the periods.

##### *2.4.2.1.1 1993–2006*

**Factor structure correlation.** The factor structure matrix shows the correlations of the variables or authors with the factors (Eom, 2009). Using principal components analysis, 11 factors (only those with a minimum eigenvalue of 1) were extracted in this period (see Table 2.8). In addition, author factor loadings were chosen at .40 or higher. If the loading is greater

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than 0.7, then the author is greatly impacted in that factor. Factor 1, dominated by authors such as Hara, Scassellati, Schaal, Atkeson, Velasquez, Cassell, and Vilhjalmsson, shows the strong influence of the artificial intelligence and robotics subfields (as computer science subfields) on the avatar concept in business and marketing disciplines. Factor 2 shows the interactivity and human factors in the computing systems subfields, dominated by Nass, Isbister, Ishida, Nishimura, and Yoshida. Factor 3 is dominated by the collaborative/networked virtual environment. Factor 4, which includes scholars such as Lange, Guttman, Moukas, and Maes, is dominated by electronic markets/commerce. Factor 5 shows the virtual environment defined by Schroeder, Taylor and Smith. Factor 6 is dominated by computer and human behaviours. Factor 7 is dominated by psychophysiology thought. Factor 8 is dominated by the asynchronous systems subfield. Factor 9 is characterised by the psychology of cyberspace. Factor 10 is represented by animation in virtual environment. Finally, factor 11 is dominated by animation and presence thoughts. The eigenvalue of a factor refers to the column sum of the squared factor loadings of all variables on that factor (Eom, 2009). The variance explained by each factor is calculated by the eigenvalue of each factor divided by the number of authors (37 in this period). The 11 factors explained 94.6% of the variance. The first three factors are the most related to the computer science discipline, together explaining approximately 50% of the total variance.

**Inter-factor correlation.** The inter-factor correlation matrix shows the correlations between the variables/authors and the factors when the variance attributable to all other factors has been removed (Eom, 2009). Table 2.9 shows the correlations between the factors. The results show a high correlation coefficient between factor 1 (artificial intelligence and robotics) and factor 5 (virtual environment). This indicates that the authors in both factors are highly co-cited. In addition, the correlations among factor 2 (the interactivity and human factors in the computing

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systems subfield), factor 6 (computer and human behaviours) and factor 8 (asynchronous systems) are high. This also indicates that the authors in factors 2, 6 and 8 are highly co-cited.

#### 2.4.2.1.2 2007–2010

**Factor structure correlation.** Moving to the second period (2007–2010) in the study, 13 factors were extracted, manifesting different subspecialties. Factor 1 seems to appear in both consumer research from marketing, management and psychology perspectives and electronic commerce subfields, in works by scholars such as Vaidyanathan, Johnson, Lynch, Riedl, Konstan, Haubl, Lam, Murray, Punj, Bellman, Qiu, Aggarwal, Ariely, Maes, Schafer and Spiekermann (see Table 2.10). Factor 2 appears to reflect the human factors from the human–computer perspective in works by scholars such as Lester, Isbister, Bickmore, Stone, Baylor, De Rosis, Lee, Van Mulken, Biocca, Cassell, Lee, Walker and Sproull, whereas factor 3 seems to represent the computer-supported cooperative from the human–computer perspective in works by scholars such as Waters, Kiesler, Garau, Sasse and Sproull. Factor 4 is dominated by the human behaviours from the human–computer perspective and includes scholars such as Webster, Trevino, Reeves and Fogg. Factor 5 is dominated by computer-mediated communication. Factor 6 represents collaborative and online games in the virtual environment subfield. Factor 7 is dominated by the computer communication subfield. Factor 8 seems to reflect the presence from the human–computer interaction perspective. Factor 9 represents scholars who focused on the advertising subfield from the marketing perspective. Factor 10 represents the virtual world subfield, whereas factor 11 seems to show new trends from the marketing perspective. Finally, the online exchange relationships from management information systems is represented by factor 12 and presence in the shared environment is represented by factor 13. The 13 factors explained 94.61% of the variance. Factors 1, 9, 11 and



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12 are the most clearly related to business and marketing disciplines, together explaining approximately 46% of the total variance.

**Inter-factor correlation.** As the inter-factor correlation matrix shows the correlations between factors, the results show a high correlations coefficient (0.402) in Table 2.11 among factor 10 (virtual world subfield), factor 11 (new trends from marketing perspective), factor 12 (online exchange relationships from management information systems perspective) and factor 13 (presence in the shared virtual environment). This indicates that the authors in these are highly are co-cited. Similarly, the results also show a high correlations coefficient (0.391) between factor 1 (consumer research from marketing, management and psychology perspectives and electronic commerce subfields) and factor 2 (the human factors from human-computer perspective), while the correlation coefficient between factor 7 (computer communication subfield) and factor 8 (the presence from human-computer interaction perspective) is 0.332.

#### 2.4.2.1.3 2011–2012

**Factor structure correlation.** Moving to the third period (2011–2012) in the study, 13 factors were extracted, reflecting different subspecialties. Factor 1 covers the personality and self-congruity area and includes scholars such as Merle, Kim, Sherry, Senecal, Tisseron, St-Onge, Cova, Bailenson and Carù, as shown in Table 2.12. Factor 2 reflects works in advertising and electronic commerce by scholars such as Mennecke, Li, Lang, Arakji and Daugherty, whereas factor 3 represents the social and educational perspectives of technology in works produced by scholars such as Moon, Nass, Bickmore, Cassell, Baylor and Stone. Factor 4 is dominated by virtual world project management and includes scholars such as Davis, Owens, Zigurs, Khazanchi, Murphy and Hemp. Factor 5 is dominated by the human factor and artificial intelligence area. Factor 6 represents the multimedia systems subfield. Factor 7 characterises

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the interactive decision aids area. Factor 8 reflects the psychological perspective. Factor 9 represents scholars who focused on the presence of avatars. Factor 10 represents the intelligent systems area, whereas factor 11 represents the marketing and consumer behaviours. Finally, the business process model subfield is represented by factor 12 and innovation by factor 13. The thirteen factors explained 91.27% of the variance. Six of all 13 factors are related to the computer science discipline, representing approximately 33% of the total variance.

**Inter-factor correlation.** The inter-factor correlation matrix in Table 2.13 shows a number of inter-correlations among the factors. For example, the results show a high correlation coefficient between factor 1 (personality and self-congruity) and factor 8 (psychological perspective). In addition, high correlations exist between factor 3 (social and educational perspectives of technology) and factor 9 (presence).

#### 2.4.2.1.4 2013

**Factor Factor structure correlation.** Moving to the last period (2013) in the study, seven factors were extracted, reflecting different perspectives. Factor 1 reflects a number of different subfields, such as human–computer interaction, cyber and media psychology, computer communication and interactive marketing, represented by scholars such as Biocca, Fox, Jin, Malter, Nantel and Blinka (see Table 2.14). Most authors in this factor addressed the avatar concept — in particular, when humans interact with avatars from a marketing perspective — such as Biocca, Ben Mimoun, Nantel and Kim. In addition, other authors in this factor examined the interactions from the psychological perspective (e.g., Konijn, Malter, Blinka and Merget). Factor 2 represents identity and virtual consumption thought in works by scholars such as Wood, Lehdonvita, Solomon, Kozinets, Turkle and Ducheneaut. Some authors in factor 2 focused on examining consumption in virtual reality (e.g., Wood, Lehdonvita and Ducheneaut)

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while other authors in this factor examined identity in virtual worlds (e.g., Kozinets and Turkle). Factor 3 represents the speech or conversational type of avatar as a communication tool with humans and includes articles by Elisei, Martin and Bailly. Factor 4, represented by Nan and Williams, focuses on the virtual reality foundations by showing the principals of that reality as well as its applications and benefits. Factor 5 is dominated by language processing technology. Factor 6 represents the identity in cyberspace. Finally, factor 7 is dominated by digital media perspectives. The seven factors explained 97.37% of the variance.

**Inter-factor correlation.** The inter-factor correlation matrix in Table 2.15 shows a large number of inter-correlations between the factors. For example, the results show a high correlation coefficient between factor 2 (identity and virtual consumption) and factor 4 (virtual world foundations). In addition, the correlations among factor 5 (language processing technology), factor 6 (the identity in cyberspace) and factor 7 (digital media perspectives) are moderate compared with the first case. Then, there is a low correlation coefficient between factor 1 (the human–computer interaction, cyber and media psychology, computer communication and interactive marketing) and factor 3 (the speech communication research).

Factor											
	1	2	3	4	5	6	7	8	9	10	11
	<i>Schaal, S</i>	<i>Nass, C I.</i>	<i>Brown, D</i>	<i>Lange,</i>	<i>Schroeder, R</i>	<i>Moon,</i>	<i>Friesen,</i>	<i>Takeda,</i>	<i>Suler, J</i>	<i>Badler</i>	<i>Chi D</i>
	<i>Velasquez, J</i>	<i>Ishida, T</i>	<i>Pawlicki,</i>	<i>Guttman,</i>	<i>Taylor, T.L</i>	<i>Steur J</i>	<i>Levenson,</i>	<i>Takeuchi,</i>	<i>Sproull,</i>	<i>Bowers</i>	<i>Slater,</i>
	<i>Atkeson, C</i>	<i>Nishimura,</i>	<i>Zyda, M l</i>	<i>Moukas,</i>	<i>Vilhjalms son</i>	<i>Reeves</i>	<i>Ekman, P</i>	<i>Nass, C I.</i>	<i>Reeves B</i>		
	<i>Scassellati, B</i>	<i>Yoshida, C</i>	<i>DeFanti</i>	<i>Maes P</i>	<i>Cassell, J</i>	<i>Nass, C</i>					
	<i>Hara,</i>	<i>Isbister, K</i>			<i>Smith, J.</i>						
	<i>Ekman, P</i>										
	<i>Cassell, J</i>										
	<i>Vilhjalms son</i>										
Variance explained (eigenvalue)	8.805	5.482	4.431	3.118	2.745	2.539	2.091	1.914	1.577	1.275	1.028
Percent of variance explained	23.797	14.816	11.976	8.427	7.419	6.863	5.652	5.173	4.262	3.446	2.778

**Table 2. 8 Factors extracted for 1993-2006**

Component	1	2	3	4	5	6	7	8	9	10	11
<b>1</b>	1.000	-.173	-.123	-.122	.450	-.159	.240	-.129	.058	.037	-.003
<b>2</b>	-.173	1.000	-.071	-.069	-.094	.302	-.050	.353	-.020	-.002	-.005
<b>3</b>	-.123	-.071	1.000	-.034	-.053	-.063	-.016	-.043	-.021	-.031	-.006
<b>4</b>	-.122	-.069	-.034	1.000	-.051	-.062	-.014	-.041	-.023	-.032	-.007
<b>5</b>	.450	-.094	-.053	-.051	1.000	-.085	.009	-.062	-.008	-.023	-.006
<b>6</b>	-.159	.302	-.063	-.062	-.085	1.000	-.044	.414	-.213	-.004	-.004
<b>7</b>	.240	-.050	-.016	-.014	.009	-.044	1.000	-.024	-.041	-.050	-.008
<b>8</b>	-.129	.353	-.043	-.041	-.062	.414	-.024	1.000	-.056	-.021	-.005
<b>9</b>	.058	-.020	-.021	-.023	-.008	-.213	-.041	-.056	1.000	.088	.010
<b>10</b>	.037	-.002	-.031	-.032	-.023	-.004	-.050	-.021	.088	1.000	.010
<b>11</b>	-.003	-.005	-.006	-.007	-.006	-.004	-.008	-.005	.010	.010	1.000

Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.

**Table 2. 9 Inter- factor correlations for 1993-2006**

Factor											
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	1	2	3	4	5	6	7	8	9	10	11	12	13
	<i>Vaid</i>	<i>Bayl</i>	<i>Gara</i>	<i>Trev</i>	<i>Rauh</i>	<i>Cast</i>	<i>Nuna</i>	<i>Farn</i>	<i>Eng l</i>	<i>Jarm</i>	<i>Cova</i>	<i>Pavl</i>	<i>Tayl</i>
	<i>Bell</i>	<i>Maye</i>	<i>Slat</i>	<i>Webs</i>	<i>Benb</i>	<i>Nels</i>	<i>Burg</i>	<i>Slat</i>	<i>Bea t</i>	<i>Lee,</i>	<i>Lee,</i>	<i>Lee,</i>	<i>Lee,</i>
	<i>Lync</i>	<i>Gong</i>	<i>Kies</i>	<i>Fogg</i>	<i>Nowa</i>	<i>Harr</i>	<i>Walt</i>	<i>Walt</i>					
	<i>Agga</i>	<i>Lee, E</i>	<i>Wate</i>	<i>Reev</i>	<i>Nass</i>	<i>Daha</i>	<i>Kies</i>	<i>WIL S</i>					
	<i>Ariely</i>	<i>de Rosi</i>	<i>Sass</i>	<i>Nass</i>	<i>Moon</i>		<i>Farn</i>						
	<i>Haub</i>	<i>Van Mu</i>	<i>Spro</i>	<i>Moo n</i>	<i>Lee K.M</i>								
	<i>Herl</i>	<i>Bick</i>	<i>Walk</i>	<i>Now a</i>	<i>Komi</i>								
	<i>John</i>	<i>Lest</i>											
	<i>Swea</i>	<i>Isbi</i>											
	<i>Lam,</i>	<i>Bioc</i>											
	<i>Murr</i>	<i>Wang</i>											
	<i>Spie</i>	<i>Ston</i>											
	<i>Kons</i>	<i>Jani</i>											
	<i>Scha</i>	<i>Cass</i>											
	<i>Punj</i>	<i>Beat</i>											
	<i>Sinh</i>	<i>Walk</i>											
	<i>Qiu, L</i>	<i>Lee, K. M</i>											
	<i>Ried</i>	<i>Spro</i>											
	<i>Sarw</i>	<i>Nass</i>											
	<i>Maes</i>	<i>Moon</i>											
	<i>Komi</i>												
Variance explained	28.09	11.92	6.30	4.381	2.866	2.791	2.259	1.578	1.15	1.02	1.015	1.015	1.015
Percent of variance explained	41.31	17.52	9.264	6.443	4.214	4.104	3.322	2.320	1.69	1.50	1.493	1.493	1.493

Table 2. 10 Factors extracted for 2007-2010

Component Correlation Matrix													
Component	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.000	-.391	-.249	-.170	-.141	.101	-.143	-.125	-.048	-.041	-.041	-.041	-.041
2	-.391	1.000	.126	.202	.238	.043	-.087	-.053	.238	-.129	-.129	-.129	-.129
3	-.249	.126	1.000	-.056	-.144	.040	.251	.359	-.031	-.069	-.069	-.069	-.069
4	-.170	.202	-.056	1.000	.354	-.048	.004	.020	.156	-.192	-.192	-.192	-.192
5	-.141	.238	-.144	.354	1.000	.123	-.141	-.134	-.028	.121	.121	.121	.121
6	.101	.043	.040	-.048	.123	1.000	-.021	-.033	-.098	.184	.184	.184	.184
7	-.143	-.087	.251	.004	-.141	-.021	1.000	.332	.049	-.131	-.131	-.131	-.131
8	-.125	-.053	.359	.020	-.134	-.033	.332	1.000	.063	-.150	-.150	-.150	-.150
9	-.048	.238	-.031	.156	-.028	-.098	.049	.063	1.000	-.238	-.238	-.238	-.238
10	-.041	-.129	-.069	-.192	.121	.184	-.131	-.150	-.238	1.000	.402	.402	.402
11	-.041	-.129	-.069	-.192	.121	.184	-.131	-.150	-.238	.402	1.000	.402	.402
12	-.041	-.129	-.069	-.192	.121	.184	-.131	-.150	-.238	.402	.402	1.000	.402
13	-.041	-.129	-.069	-.192	.121	.184	-.131	-.150	-.238	.402	.402	.402	1.000

Extraction Method: Principal Component Analysis.    Rotation Method: Promax with Kaiser Normalization.

**Table 2. 11 Inter-factor correlations for 2007-2010**

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### 2.4.2.2 Cluster analysis

#### 2.4.2.2.1 1993–2006

The cluster analysis of this period resulted in 36 clusters. The dendrogram in Figure 2.2 depicts the hierarchical clustering of seven groups of avatar concepts as defined by researchers. The figure depicts the cluster structure and joining sequence to show how each of the authors in that period is combined into a new aggregate cluster until all 37 authors were categorised into the final cluster (cluster one [CL1] in Figure 2.2). Cluster 11 refers to psychological thought, corresponding to factors 9, 10 and 11 in Table 2.8. Cluster 15, 20 and 21 were combined to create cluster 11, which in turn was joined with clusters 26, 32 and 33 to form the larger cluster 8. The combination between these clusters means that the authors of these clusters are highly co-cited in the selected articles. Then, cluster 8 was grouped into a new bigger cluster (CL6) with the computer and human behaviours cluster (CL14). In the subsequent step, cluster 6 was combined with cluster 22 to form a new cluster (CL4).

The dendrogram illustrates the links among different clusters, and influences can be inferred based on the close examination of the works of the authors in the clusters (Eom & Farris, 1996). For example, cluster four includes related factors which explain similar thoughts or specialties, such as factors 3, 5 and 10 in the component analysis (CL 22, 33 and 21). This confirms the highly co-citation between those authors in the selected articles. In the subsequent step, cluster 4 was grouped into a new bigger cluster (CL3) with cluster (CL19). In addition, cluster 7 which includes Factor 2 was combined with cluster 3 which mainly includes factors 6 and 8 in a bigger cluster (CL2), confirming the strong interconnections in the inter-factor results. Cluster 5 consists of cluster 13 (all of factor 1 in Table 2.8) and cluster 16 (common authors in factors 1 and 5). High correlation coefficients (0.450 in Table 2.9) between the factors 1 and 5 confirm the strong interconnections. In the final agglomerative clustering procedure, cluster 5 was combined with cluster 2 to form the final cluster (CL1).

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	<i>Merl</i>	<i>Menn</i>	<i>Bick</i>	<i>Davi</i>	<i>Gilb</i>	<i>Benf</i>	<i>Häub</i>	<i>Blas</i>	<i>Schr</i>	<i>Wool</i>	<i>Kozi</i>	<i>Kosc</i>	<i>Pitt,</i>
	<i>Kim, J</i>	<i>Li, H</i>	<i>Cass</i>	<i>Owen</i>	<i>Isbi</i>	<i>Snow</i>	<i>Wang,</i>	<i>Yee,</i>	<i>Axel</i>	<i>Grat</i>	<i>Cova</i>	<i>Murp</i>	<i>Füll</i>
	<i>Sher</i>	<i>Lang</i>	<i>Moon</i>	<i>Zigu</i>	<i>Naka</i>	<i>Gree</i>	benb	Jin,	Blas		Carù		
	<i>Sene</i>	<i>Arak</i>	<i>Nass,</i>	<i>Khaz</i>	<i>Benb</i>			Bioc	Bioc				
	<i>Tisse</i>	<i>Daug</i>	<i>Bayl</i>	<i>Murp</i>	Gree				Moon,				
	<i>Cova</i>	<i>Bioc</i>	<i>Stone</i>	<i>Hemp</i>					Nass				
	<i>St-On</i>		Schr						Bail				
	<i>Carù</i>								Bayl				
	<i>Bail</i>												
	<i>Yee, N</i>												
<b>Variance explained</b>	9.451	6.784	6.026	5.050	3.127	2.627	2.137	1.99	1.692	1.587	1.304	1.028	1.021
<b>Percent of variance explained</b>	19.689	14.133	12.55	10.521	6.514	5.473	4.451	4.14	3.526	3.306	2.717	2.142	2.128

**Table 2. 12 Factors extracted for 2011-2012**

Component Correlation Matrix													
Component	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.000	-.100	-.043	-.184	-.084	-.062	-.020	.302	.042	.037	.253	.053	2.812E-017
2	-.100	1.000	.027	-.066	-.008	.110	.102	.124	.207	-.048	-.135	.136	1.120E-015
3	-.043	.027	1.000	-.085	-.039	.022	.039	-.005	.358	-.026	-.116	.161	4.591E-015
4	-.184	-.066	-.085	1.000	-.079	-.051	-.021	-.088	.008	.042	.016	-.270	-1.610E-016
5	-.084	-.008	-.039	-.079	1.000	.097	.366	.111	.065	-.021	-.083	.033	-4.341E-016
6	-.062	.110	.022	-.051	.097	1.000	.192	.055	.154	-.050	-.094	.081	1.024E-015



7	-.020	.102	.039	-.021	.366	.192	1.000	.028	.192	-.071	-.116	.138	2.055E-015
8	.302	.124	-.005	-.088	.111	.055	.028	1.000	.127	-.015	-.048	.071	1.820E-015
9	.042	.207	.358	.008	.065	.154	.192	.127	1.000	-.096	-.264	.259	6.142E-015
10	.037	-.048	-.026	.042	-.021	-.050	-.071	-.015	-.096	1.000	.037	.000	1.648E-015
11	.253	-.135	-.116	.016	-.083	-.094	-.116	-.048	-.264	.037	1.000	-.223	-9.447E-015
12	.053	.136	.161	-.270	.033	.081	.138	.071	.259	.000	-.223	1.000	9.319E-015
13	2.812 E-017	1.120 E-015	4.591 E-015	-1.610 E-016	-4.341 E-016	1.024 E-015	2.055 E-015	1.820 E-015	6.142 E-015	1.648E-015	-9.447E-015	9.319E-015	1.000

Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.

Table 2. 13 Inter-factor correlations for 2011-2012

	Factor						
	1	2	3	4	5	6	7
<i>Biocca F</i>		<i>Wood, N T</i>	<i>Elisei, F</i>	kozinets	<i>Marshall, I</i>	<i>Miller H.</i>	<i>Angwin, J.</i>
<i>Ulusoy E</i>		<i>Lehdonvirta, V</i>	<i>Martin, J.-C</i>	<i>Williams, D</i>	Doyle , D.	Doyle , D.	Doyle , D
<i>Aghajan Y,</i>		<i>Solomon, M R.</i>	<i>Bailly, G</i>	Nah, F.-H			Marshall, I
<i>Kim Y</i>		<i>Kozinets, RV</i>		Bailenson, J			
<i>Konijn EA</i>		<i>Bailenson, J N</i>					
<i>Fox J</i>		<i>Turkle, S.</i>					
<i>Ben Mimoun MS</i>		Williams, D					
<i>Jin SAA</i>		Ducheneaut, N					
<i>Krämer NC</i>							
<i>Malter AJ</i>							
<i>Nantel J</i>							
<i>Peña J</i>							
<i>Rauh C</i>							
<i>Van Vugt HC</i>							
<i>Taylor TL</i>							
<i>Vicdan H</i>							
<i>Blinka L</i>							
<i>Garbarino EC</i>							
<i>Hoorn JF</i>							
<i>Kafai YB</i>							
<i>Kang S-H</i>							

	<i>Merget D,</i>						
	<i>Kim J</i>						
	<i>Merola NA</i>						
	<i>St-Onge A</i>						
	<i>Tisseron S</i>						
	<i>Merle A,</i>						
	<i>Gratch J,</i>						
	<i>Senecal S</i>						
	<i>Jin H-J</i>						
	<i>Schroeder R</i>						
	<i>Suh K-S</i>						
	<i>Nowak, K.L.</i>						
	<i>Yee, N.</i>						
	<i>Ducheneaut, N</i>						
	<i>Turkle, S.</i>						
	<i>Bailenson, J N</i>						
	<i>Elisei,F</i>						
	<i>Martin, J.-C</i>						
	<i>Bailly, G</i>						
<b>Variance explained</b>	36.167	5.793	2.379	1.284	1.020	1.020	1.020
<b>Percent of variance explained</b>	72.334	11.585	4.758	2.569	2.041	2.041	2.041

**Table 2. 14 Factors extracted for 2013**

<b>Component Correlation Matrix</b>							
<b>Component</b>	1	2	3	4	5	6	7
<b>1</b>	1.000	.054	.279	.000	-.021	-.021	-.021
<b>2</b>	.054	1.000	.119	.544	-.055	-.055	-.055
<b>3</b>	.279	.119	1.000	.031	.171	.171	.171
<b>4</b>	.000	.544	.031	1.000	-.125	-.125	-.125
<b>5</b>	-.021	-.055	.171	-.125	1.000	.334	.334
<b>6</b>	-.021	-.055	.171	-.125	.334	1.000	.334
<b>7</b>	-.021	-.055	.171	-.125	.334	.334	1.000

**Table 2. 15 Inter-factor correlations for 2013**

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#### 2.4.2.2.2 2007-2010

The dendrogram in Figure 2.3 shows the hierarchical clustering for 2007–2010. It aims to find the authors who highly co-cited are combined into an aggregate cluster. A total of 67 clusters/observations were formed for this period. The dendrogram in Figure 2 shows the hierarchical clustering of four groups of scholars focused on the avatar concept in this period. Cluster 55 reflects factor 4 in Table 2.10 (which dominated by the human behaviours from the human–computer perspective in factor analysis). The cluster includes all authors in factors 10, 11, 12 and 13, confirming the high correlation between them as evident in the factor analysis (coefficient 0.402). Clusters 67, 55, 18 and 9 were combined to create the larger cluster 5 which, in turn, was joined with cluster 13 (corresponding to factor 3 in the factor analysis) to form the larger cluster 4. In the next clustering procedure, cluster 4 was combined with cluster 11 to form a new one (CL2). Cluster 11 matches factor 1 (consumer research from marketing, management and psychology perspectives and electronic commerce subfields) in the factor analysis as it includes all authors in this factor. In the subsequent step, cluster 26 was grouped with cluster 10 into a new bigger cluster 8. Cluster 8 includes all the authors from factors 2 and 3 in the factor analysis. Cluster 3, which includes the smaller clusters 8 and 20, was combined with cluster 2 to form the final cluster (CL1).

#### 2.4.2.2.3 2011-2012

Moving to the third period, the cluster analysis of this period resulted in 47 clusters. The dendrogram in Figure 2.4 shows the hierarchical clustering of six groups of avatar concept-related research. The cluster structure and the joining sequence as shown in that figure depict how each of the authors in that period was combined into a new aggregate cluster until all 48 authors were categorised into cluster one in Figure 2.4. Cluster 45 refers to the interactive

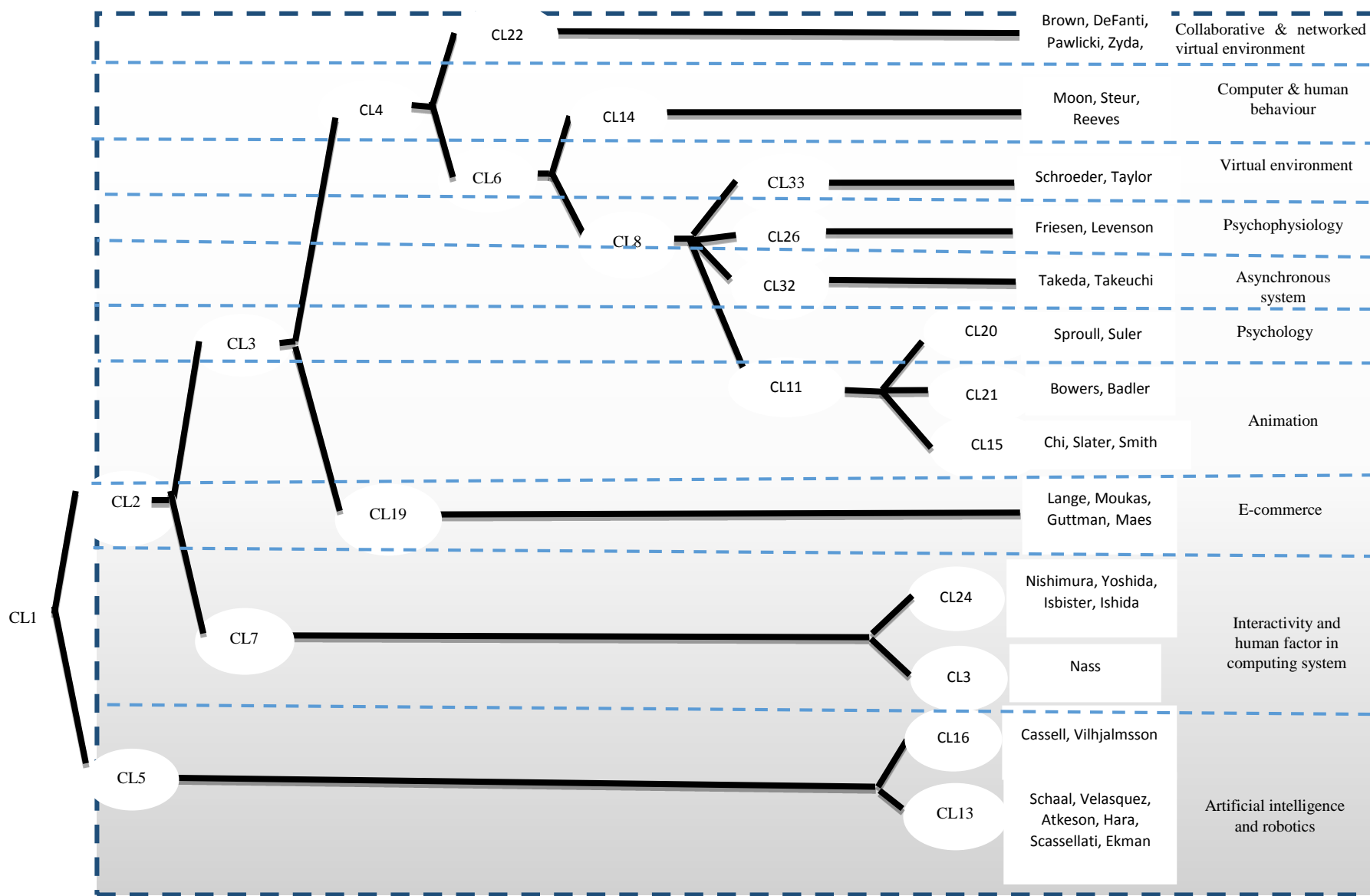


Figure 2. 2 Dendrogram for 1993–2006

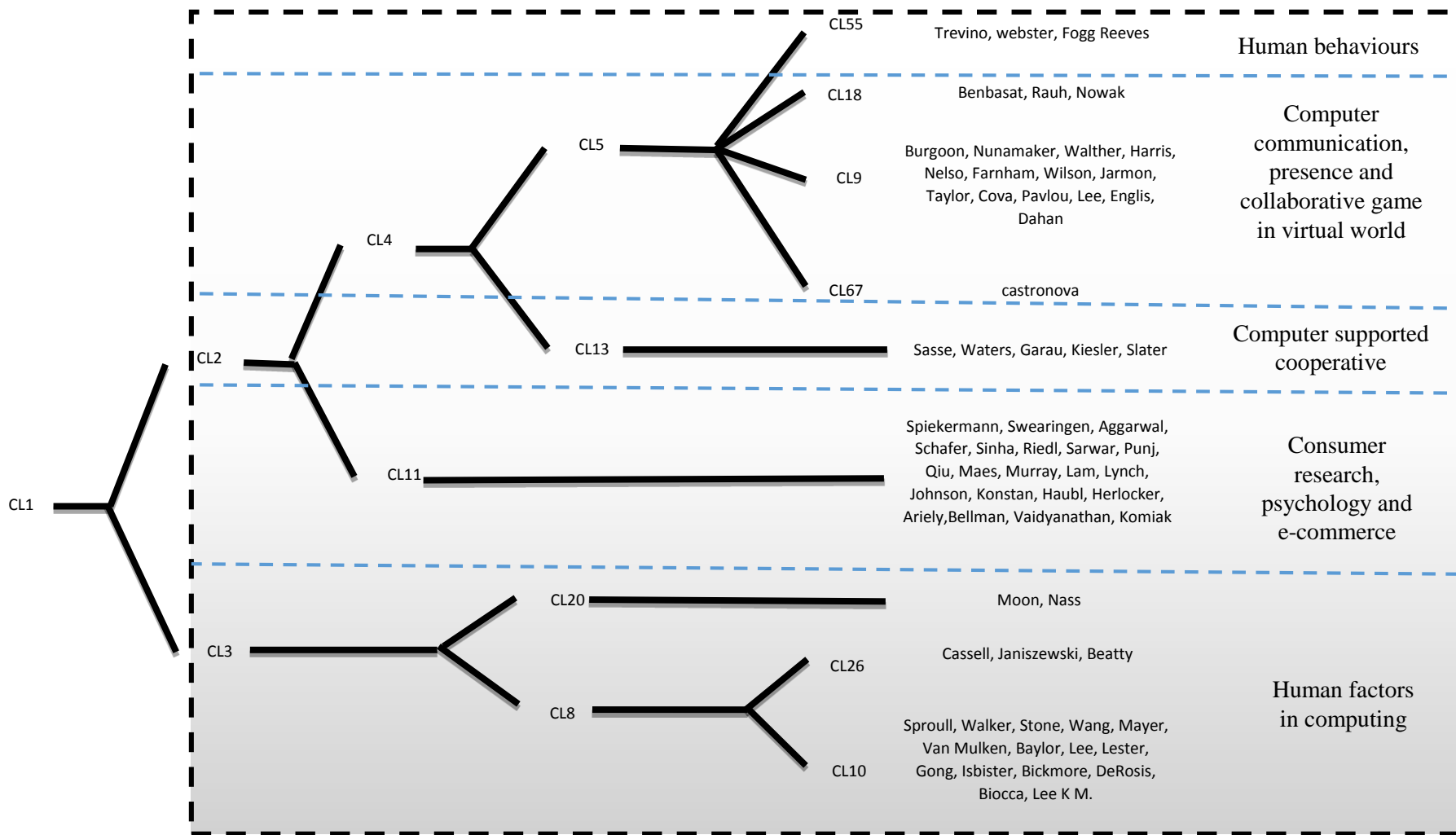


Figure 2. 3 Dendorogram for 2007–2010

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decision aids, corresponding to factor 7 in Table 2.12. Clusters 45, 47 and 17 were combined to create the larger cluster 14, which in turn was joined with clusters 19, 31 and 44 to form cluster 8. In the next clustering procedure, cluster 8 was grouped with cluster 42 (human factor and artificial intelligence area) into the bigger cluster 6 in Table 22. Next, cluster 6 was combined with cluster 22 to form cluster 4. In addition, clusters 46 and 34, corresponding to factor 2 in the factor analysis, were combined to form cluster 7. The high correlation, as evident in the factor analysis, between factors 3 and 9 (coefficient .358) confirmed the combination of cluster 24 (corresponding to factor 3) and cluster 15 (corresponding to factors 3 and 9) to create cluster 12. Cluster 4 was then grouped into the new bigger cluster 2 along with clusters 7 and 12. The cluster results also confirmed the high correlation between factors 1 and 8 (coefficient .302). Cluster 11, which includes the smaller clusters 13 and 43 corresponding to factor 1, was combined with cluster 41, which reflects factor 8 in the factor analysis, to create the bigger cluster 5. In the final agglomerative clustering procedure, cluster 5 was combined with cluster 2 to form the final cluster, cluster 1.

#### 2.4.2.2.4 2013

For 2013, the cluster analysis resulted in 49 clusters. The dendrogram in Figure 2.5 depicts the hierarchical clustering of three groups of avatar concept-related research. Cluster 5 includes the identity and virtual consumption thought, corresponding to factor 5 in Table 2.14. Cluster 4 includes authors represented in different factors in the principal analysis — namely, factors 3, 4, 5, 6 and 7. These factors represent different areas in the computer science discipline. This might confirm the interconnections in the inter-factor results. Clusters 5 and 4 were combined to create cluster 3, confirming the strong interconnections of the inter-factor results, particularly between factors 2 and 4. In the next clustering procedure, cluster 7 was grouped with cluster 8 into the larger cluster 2. Cluster 7 includes all authors represented by factor 1 in the factor

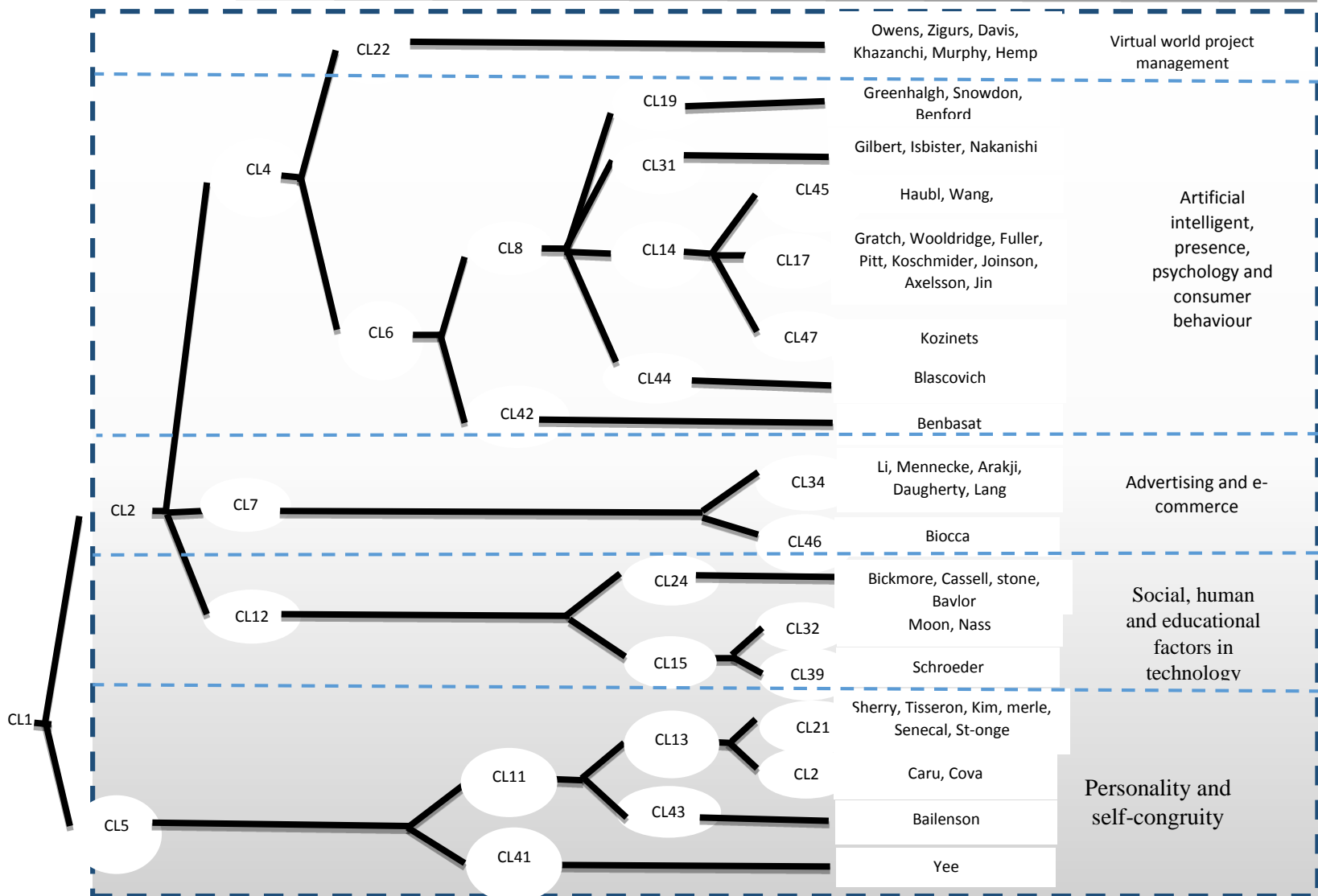


Figure 2. 4 Dendrogram for 2011–2012

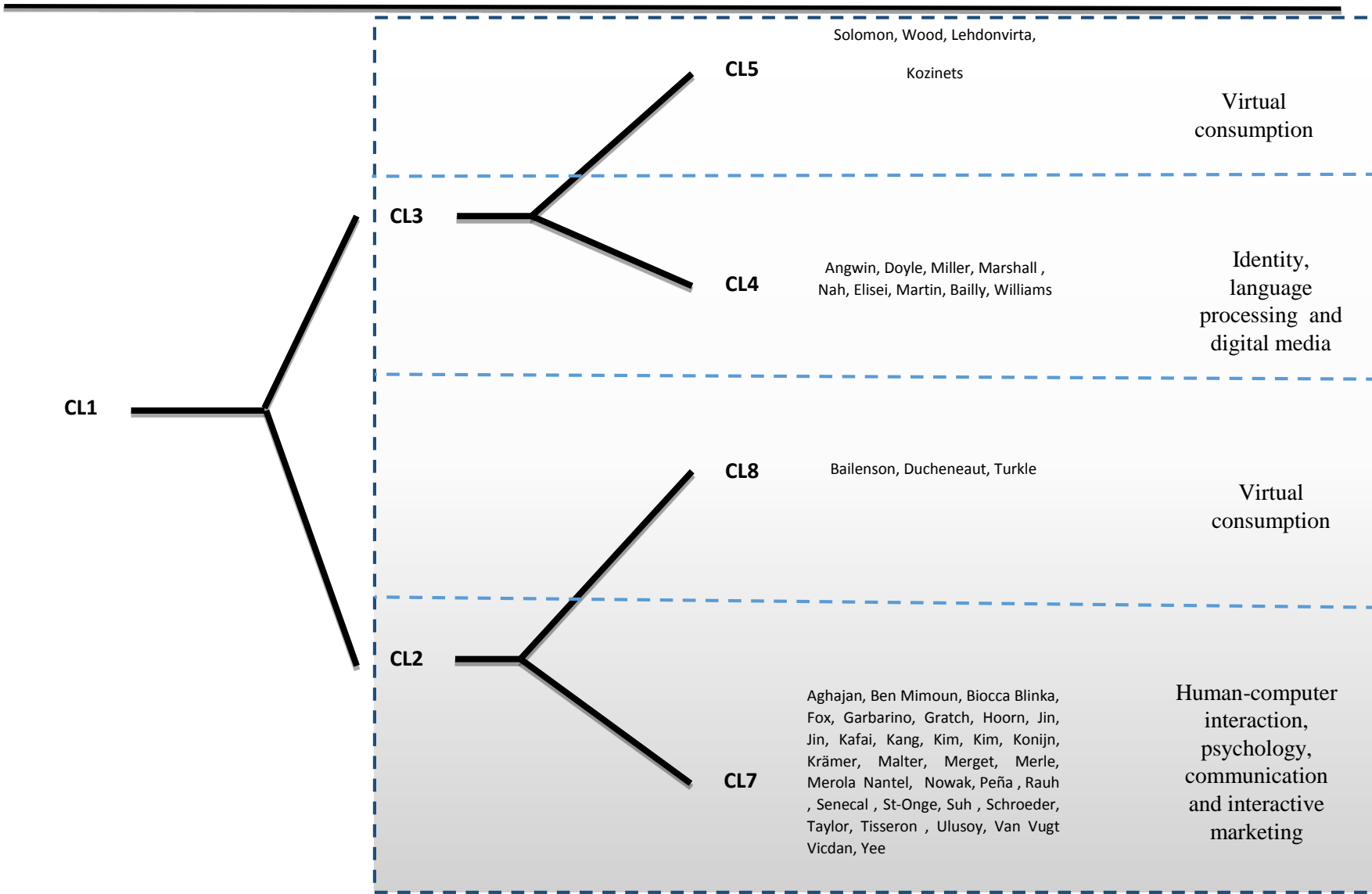


Figure 2. 5 Dendrogram for 2013



analysis, which refers to the psychological and marketing perspectives of human and computer interaction, whereas cluster 7 includes authors in factors 1 and 2 (identity and virtual consumption thought). In the final step, cluster 2 was combined with cluster 3 to form the final cluster 1.

#### 2.4.2.3 *Multidimensional scaling*

Four two-dimensional maps resulted, each one representing one of the four periods in the study, as shown in Figures 2.6–2.9. The author names were re-arranged, but their positions were kept in their appropriate positions so that the resulting map would be easy to read. Stress is an important issue used for judging the goodness of fit of a multidimensional scaling solution (Kruskal, 1964). Five conditions determine to what extent the model has perfect/bad fitting solution as following:

Stress	Goodness of fit
20%	poor
10%	fair
5%	good
2½%	excellent
0%	perfect

Although stress values for the two-dimensional maps in all periods are slightly greater than 0.2, they have the advantages of being easy to interpret the results compared with three-dimensional maps. In other words, the stress would be considerably improved by increasing dimensions, but a two-dimensional solution is a better approximation of what one might get from higher dimensions (Nerur et al., 2008). Squared correlation (RSQ) is the proportion of variance of the scaled data (IBM SPSS statistics 20). A summary of the stress and RSQ for all periods is shown in Table 2.16.

	Two-dimensional map		Three-dimensional map	
	Stress	RSQ	Stress	RSQ
Period (1999-2006)	.21919	.86117	.09336	.94002
Period (2007-2010)	.24956	.74530	.19357	.74687
Period (2011-2012)	.23078	.85954	.10878	.92766
Period (2013)	.25246	.75695	.16610	.83113

**Table 2. 16 Summary of stress and RSQ for all periods**

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#### 2.4.2.3.1 1993-2006

Figure 2.6 presents a two-dimensional MDS map to show authors who co-cited in the selected avatar concept studies between 1993 and 2006. The MDS map depicts the distance between the authors. As the distances between authors became closer, they are usually cited together. For example, Figure 2.6 shows that authors Isbister, Ishida, Nishimura and Reeves are located in proximate distances which means they are usually co-cited. Similarly, Badler and Brown are co-cited, and authors such as Maes, Lang and Guttman also usually appear together in the citation. Finally, the authors Cassell and Alkeson are located in proximate positions or distances. It is important to mention is that authors cited many times with different authors might appear in the central position among those authors. In other words, some authors are cited in more than one study and other authors who are co-cited with these authors in each study are different. For instance, Nass is cited three times (in three selected studies): with Moon, Reeve and Steur; with Takeda and Takeuchi; and with Isbister, Ishida, Nishimura and Yoshida. This suggests that Nass appears in a separate distance between those authors. Vilhjalmsson is similar to Nass in this period.

#### 2.4.2.3.2 2007–2010

Figure 2.7 shows the second two-dimensional map of authors cited in the selected studies on the avatar concept in 2007–2010. The proximity of authors in the map indicates that they are usually cited together in the journal articles. Some examples are explained from Figure 2.7. The authors Biocca, Baylor and Bickmore are located in proximate distances on the top left of the map as they are usually cited together in articles. The authors Cassell, Janiszewski, Walker and Lee (K, M) are located in proximate distances to each other down the right side of the map; they are also co-cited in articles. Some other examples are evident in Figure 2.7, such as Nowak, Benbasat and Rauh. Likewise, Reeves, Webster, Trevino and Fogg are also located in proximate distances to each other.

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#### 2.4.2.3.3 2011-2012

Moving to the next period, Figure 2.8 presents the conceptual structure, as a two-dimensional map, of the authors who significantly influenced the selected studies of avatars in 2011–2012. The proximity of two scholars reveals that both scholars are usually cited together, proposing an interconnection between their works. For example, Merle, Sherry, Senecal and Tisseron are located proximately in the map in Figure 2.8, meaning that they are co-cited in the selected studies and appear to have common works or interests. Likewise, Cova and Caru have proximate distances. In contrast, authors such as Blascovich and Baylor are located further apart, meaning they are rarely or not co-cited in the avatar studies as they have no works in common. Authors cited many times with different authors might appear in the central position between them. For instance, Yee is cited many times in this period with authors such as Biocca, Blascovich, Merle, Sherry, Kim and St-Onge. A similar example is Murphy.

#### 2.4.2.3.4 2013

Figure 2.9 shows the two-dimensional map of authors cited in the selected studies on the avatar concept in 2013. As mentioned, the proximity of authors in the map indicates that they are usually cited together. Authors Wood, Lehdonvirta and Solomon are located together at the top of the map whereas authors Hoorn, Fox, Gratch and Garbarino are located in proximate distances to each other. Likewise, Blinkal, Biocca and Ben Mimmoun are located in very proximate distances to each other. This means authors in each group are usually cited together. Finally, Balienson, is located in far from other authors as he cited more than one time with different authors. This might indicate the failing to be located in proximity to specific author(s).

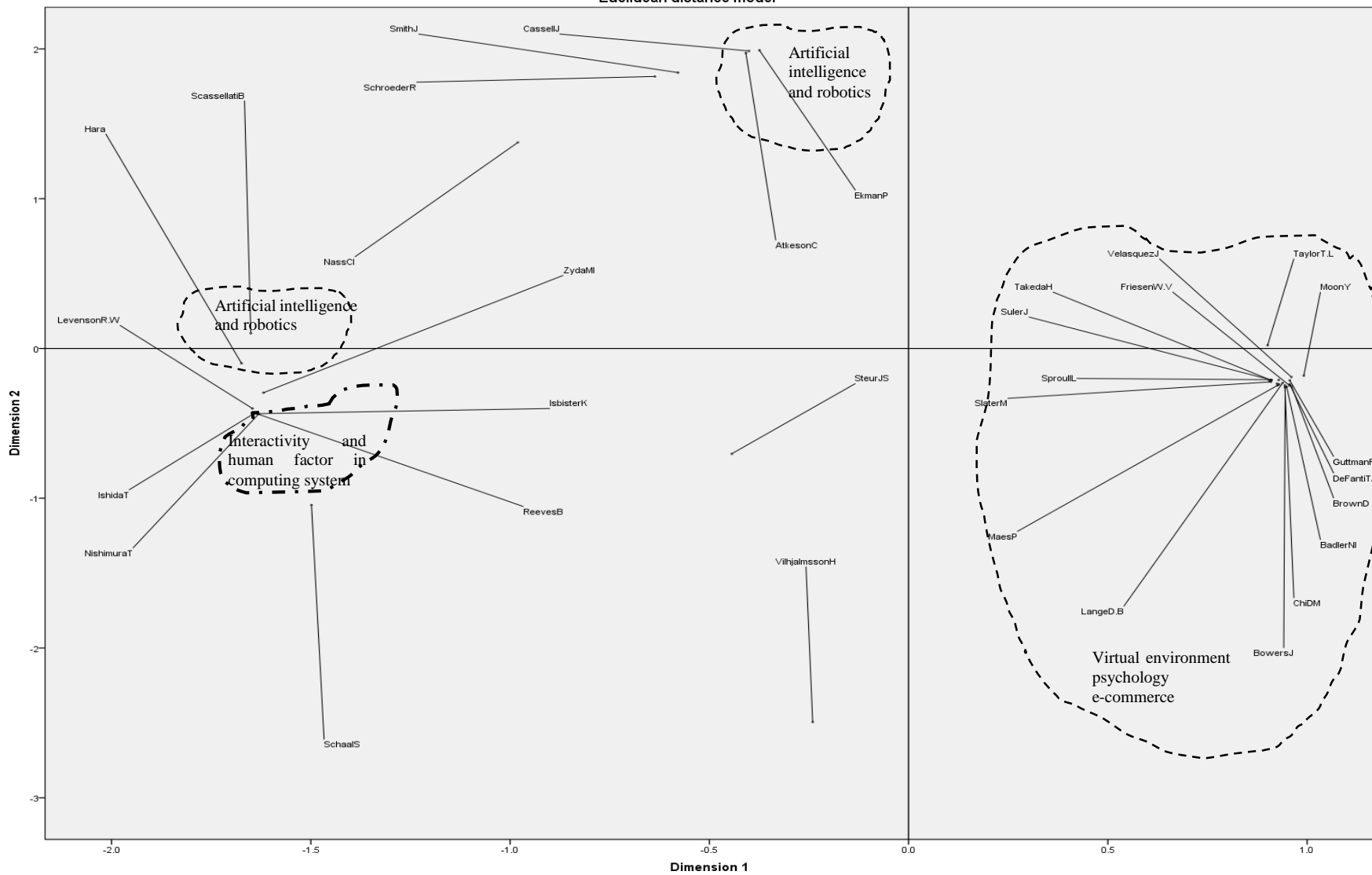


Figure 2. 6 Two-dimensional MDS map for 1999-2006

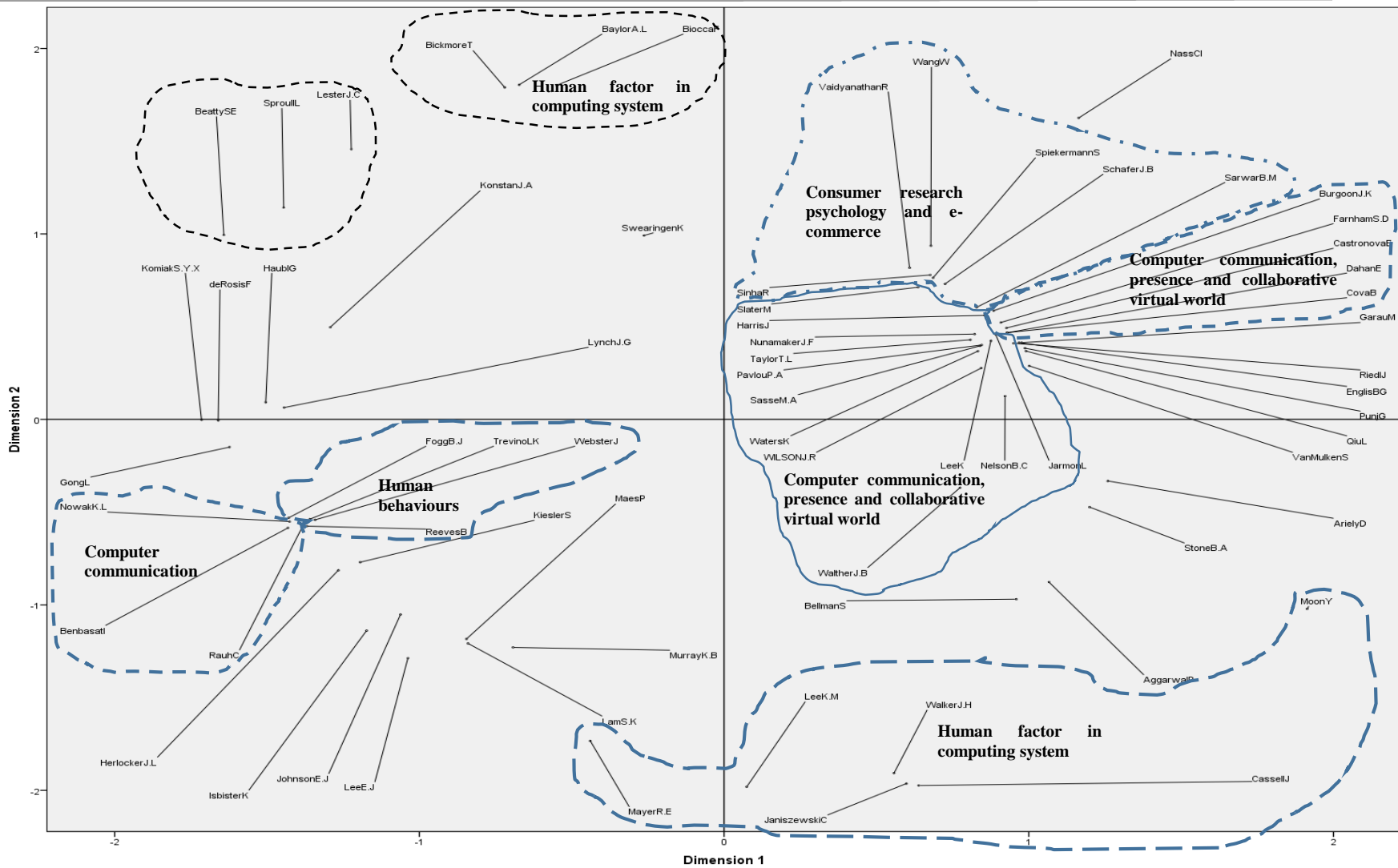


Figure 2. 7 Two-dimensional MDS map for 2007-2010

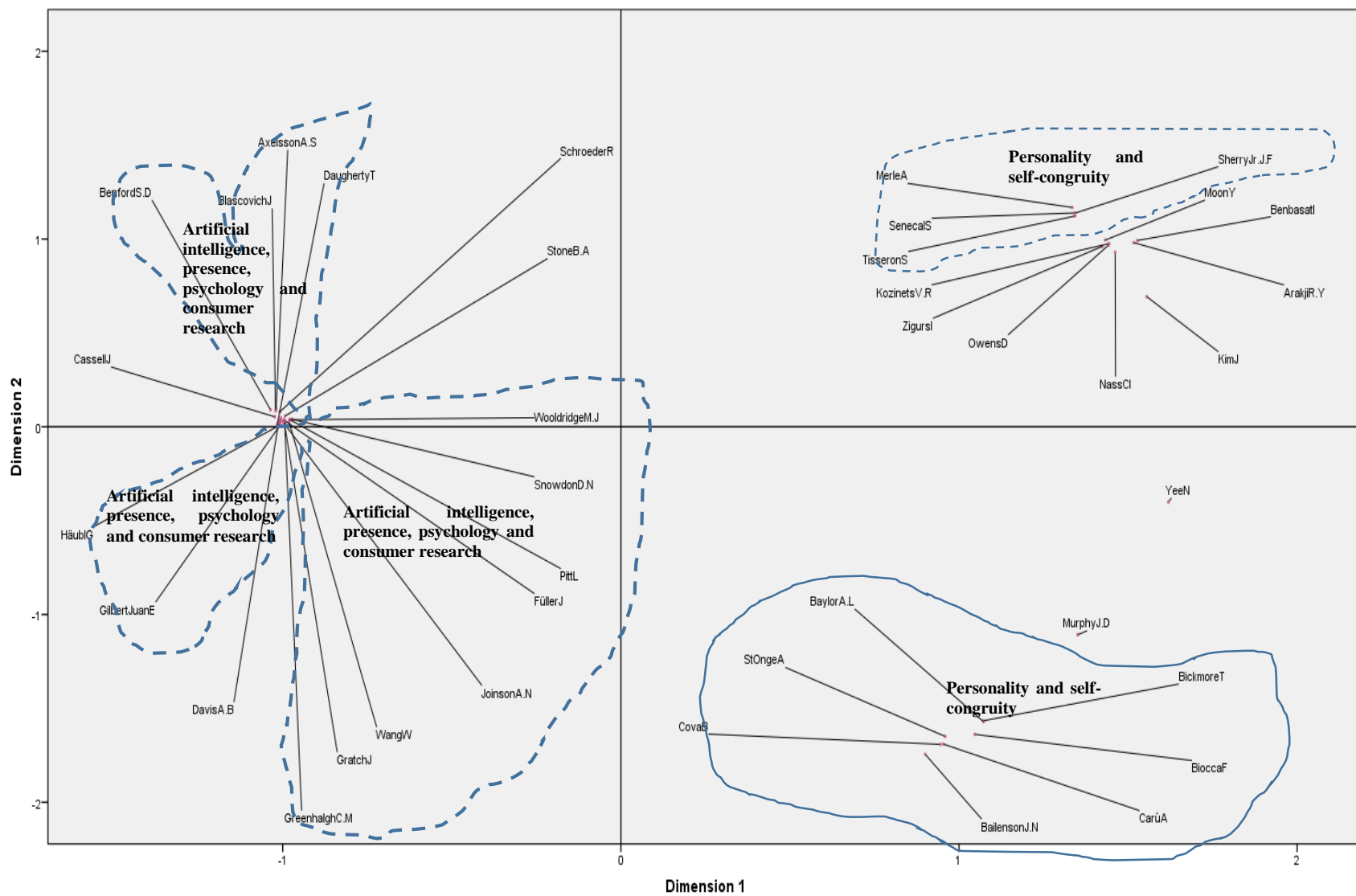


Figure 2. 8 Two-dimensional MDS map for 2011-2012

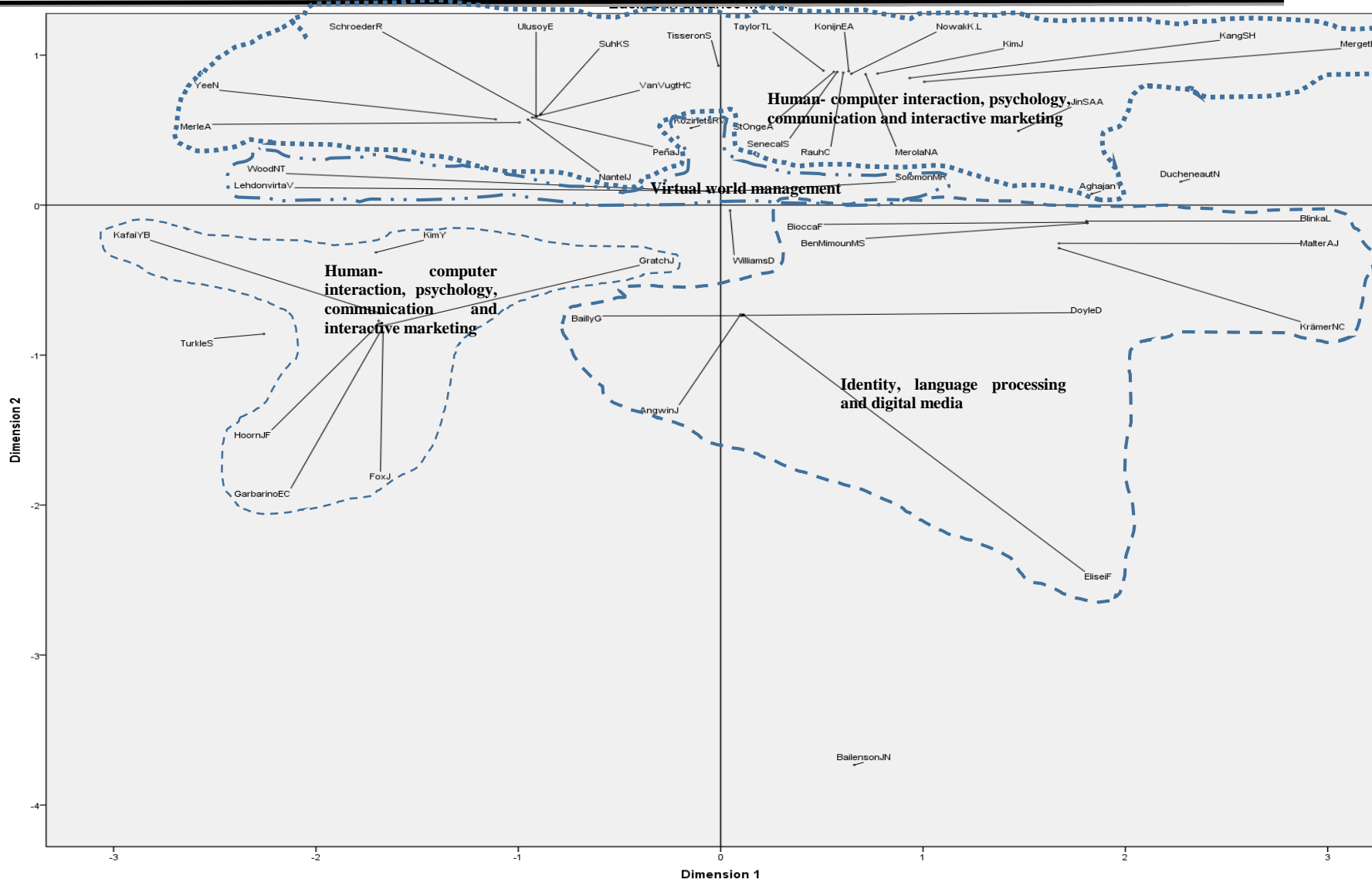


Figure 2. 9 Two-dimensional MDS map for 2013

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## 2.5 Discussion

The main goal of this chapter was to develop the intellectual structure of the avatar concept, particularly in the business and marketing disciplines. This study adopted some different approaches and procedures to draw the map avatar concept.

### *2.5.1 Limited attention on avatar studies in business and marketing disciplines*

The systematic literature review approach was adopted to capture most of the studies which mentioned the concept of avatar. The results of this study reveal that the avatar concept can be considered as a contemporary concept in all investigated disciplines (e.g., computer science, communications), particularly in the business and marketing disciplines. The majority of the studies which examined the avatar concept were published in 2000 or later. For instance, approximately 94% of the articles (310 of 329 of all articles) in the business and marketing disciplines have been published since 2000. Comparing the different disciplines of these studies, scholars in the business and marketing disciplines have published limited articles investigating the avatar concept. In general, despite the positive increasing trend in both disciplines, further investigations of avatars are still needed as the results of the literature search found only 329 articles in 10 databases which mentioned avatars. Of these 329 articles, only 130 examined this concept in detail or extensively whereas the remaining articles (199) mentioned the avatar concept three times or less per article, suggesting the need for further investigation of the avatar concept. In addition, the business discipline includes 14 sub-disciplines, as previously mentioned. Therefore, the 130 articles in the business and marketing disciplines are considered evidence or an indicator of the limited attention of investigating the avatar concept and the need for further examination, particularly from these perspectives.



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### ***2.5.2 Limited attention on avatar studies in marketing discipline versus business sub-disciplines***

To examine the avatar concept across the marketing and business disciplines, articles were categorised according to the journals' classifications. The results revealed that most avatar studies were published in the information management journals as a business sub-discipline. For example, five of the information management journals — *Communications of the ACM*, *MIS Quarterly*, *International Journal of Human Computer Studies*, *Journal of Management Information Systems* and *Information Systems Management* — published 92 articles of the 329 total articles. The remaining 237 articles were published via 98 journals in other business sub-disciplines and the marketing discipline. In addition, the results showed that the top 11 marketing journals published only 55 articles on the avatar topic. This considerably shows the lack of marketing studies on the avatar concept, confirming the finding of McGoldrick et al. (2008). Other results related to the disciplines of the studies that cited the selected articles in business and marketing disciplines (130 articles), shown in Table 15, revealed that only 14.29% of all cited articles were in the marketing discipline and 28.75% were in the business discipline. However, 57.96% of all cited articles were from other disciplines. Thus, of the marketing or business avatar articles cited by 100 articles, only 15 were related to the marketing disciplines, suggesting the limited publishing rate of avatar articles in marketing disciplines.

### ***2.5.3 Most significant sub-disciplines and pioneers affected when establishing the avatar concept***

The ACA was conducted to identify the important studies and influential scholars. The results of factor analysis revealed different factors in each period which represented different subfields. These results indicate that a great number of the factors/subfields are related to the computer science discipline. Therefore, the most influential discipline when publishing avatar studies in the business and marketing discipline is the computer science discipline. Furthermore, the most

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influential sub-disciplines in these studies were human–computer interaction, virtual reality or environment and the artificial intelligence subfields. The ACA approach also helped show the most influential articles. The results showed that a number of scholars were cited in 3 of the four periods. For example, Cassell, Isbister, Moon and Nass were cited in studies in three periods (1993–2012), suggesting that they were pioneers in the development of the avatar concept and had considerable influence when investigating this concept in both disciplines (business and marketing) during the three periods. Meanwhile, other scholars significantly impacted the development of avatar articles in both disciplines during two periods. For instance, Maes, Reeves, Slater and Sproull mostly influenced articles between 1993 and 2010 while Baylor, Benbasat, Bickmore, Cova, Haubl, Stone and Wang mostly influenced them between 2007 and 2012 and Bailenson, Gratch, Jin, KimKozinets, Senecal, St-Onge, Tisseron and Yee significantly influenced them between 2010 and 2013. Furthermore, the multivariate techniques showed authors who were cited together and might have common interests. These results will help future authors identify the appropriate scholars’ work in their studies.

## **2.6 Chapter summary**

This chapter aimed to map the current studies of the avatar concept, particularly in the business and marketing disciplines between 1993 and 2013. The systematic literature reviews and ACA approaches were adopted. Based on the findings, a limited number of studies examined the avatar concept in both marketing and business disciplines; thus, further studies are needed. This chapter could motivate scholars to conduct further examinations of the avatar concept in the marketing and business disciplines for two reasons. First, this concept is considered a new/recently emerged one. Second, a limited number of studies are shown in the findings. According to the ACA results, the computer science discipline significantly influenced the development of the selected articles in this study, particularly human–computer interaction,

virtual reality and the artificial intelligence subfields. Finally, some scholars' contributions were considerably influential in the selected studies. The contributions of Cassell, Isbister, Moon and Nass were cited during the three periods (1993–2012), indicating that they have been pioneers in the development of the avatar concept. Other scholars were significantly influential as well, but only in two periods, including Maes, Reeves, Slater and Sproull between 1993 and 2010; Baylor, Benbasat, Bickmore, Cova, Haubl, Stone and Wang between 2007 and 2012; and Bailenson, Gratch, Jin, Kim, Kozinets, Senecal, St-Onge, Tisseron and Yee between 2010 and 2013.

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## Chapter Three: Theoretical foundations of an avatar concept

### 3.1 Introduction

The systematic literature review of the avatar concept and citation analysis in Chapter Two serves as the prelude for building the theoretical foundations of the avatar concept. The current chapter aims to review the business and marketing literature to identify the studies which examined similar terminology to the avatar. In addition, it takes a closer look at these studies to determine the definitions, similarities, differences and characteristics in order to build the theoretical background of the avatar concept. Consequently, this chapter is divided into two main sections: the systematic literature review of the similar terminologies section and the theoretical background of the avatar concept section, as shown in Figure 3.1.

### 3.2 Systematic literature review of the similar terminology

A comprehensive review of avatar concept studies was conducted in the previous chapter to identify the extent of studies on the avatar concept in business disciplines. However, one of the main limitations recognised was that the term *avatar* was only used or identified in the search strategy. However, other similar terminology, such as ‘embodied conversational agents’<sup>4</sup> (e.g., Breazeal, 2003; Cassell & Bickmore, 2000), ‘virtual agents’<sup>5</sup> (e.g., Traum, Marsella, Gratch, Lee, & Hartholt, 2008), ‘interactive characters’<sup>6</sup> (e.g., Isbister & Nass, 2000), and ‘animated pedagogical agents’<sup>7</sup> (e.g., Johnson et al., 2000; Mayer & Scott, 2012) could have been used and should be identified to show the similarities to and differences of the avatar concept. This section aims to identify the articles which include such similar terminology using the same approach (i.e., SLR) and search strategy. It includes two main subsections: research methodology and main results.

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<sup>4</sup> Embodied conversational agents are a type of interface characters that used for overcoming the problems associated with human–technology interactions.

<sup>5</sup> Virtual agents are animated embodiments seen on the screen that feature a human-like appearance and present various human-like behaviours, such as speech, emotions, gestures, and eye, head, and body movements.

<sup>6</sup> Using interactive characters in computer interfaces, which refers to avatars on retail websites, particularly in the marketing and human–computer interaction literature.

<sup>7</sup> Animated pedagogical agents are an example of avatars in multi-user virtual environments, providing more enhanced and natural e-learning platforms or environments.

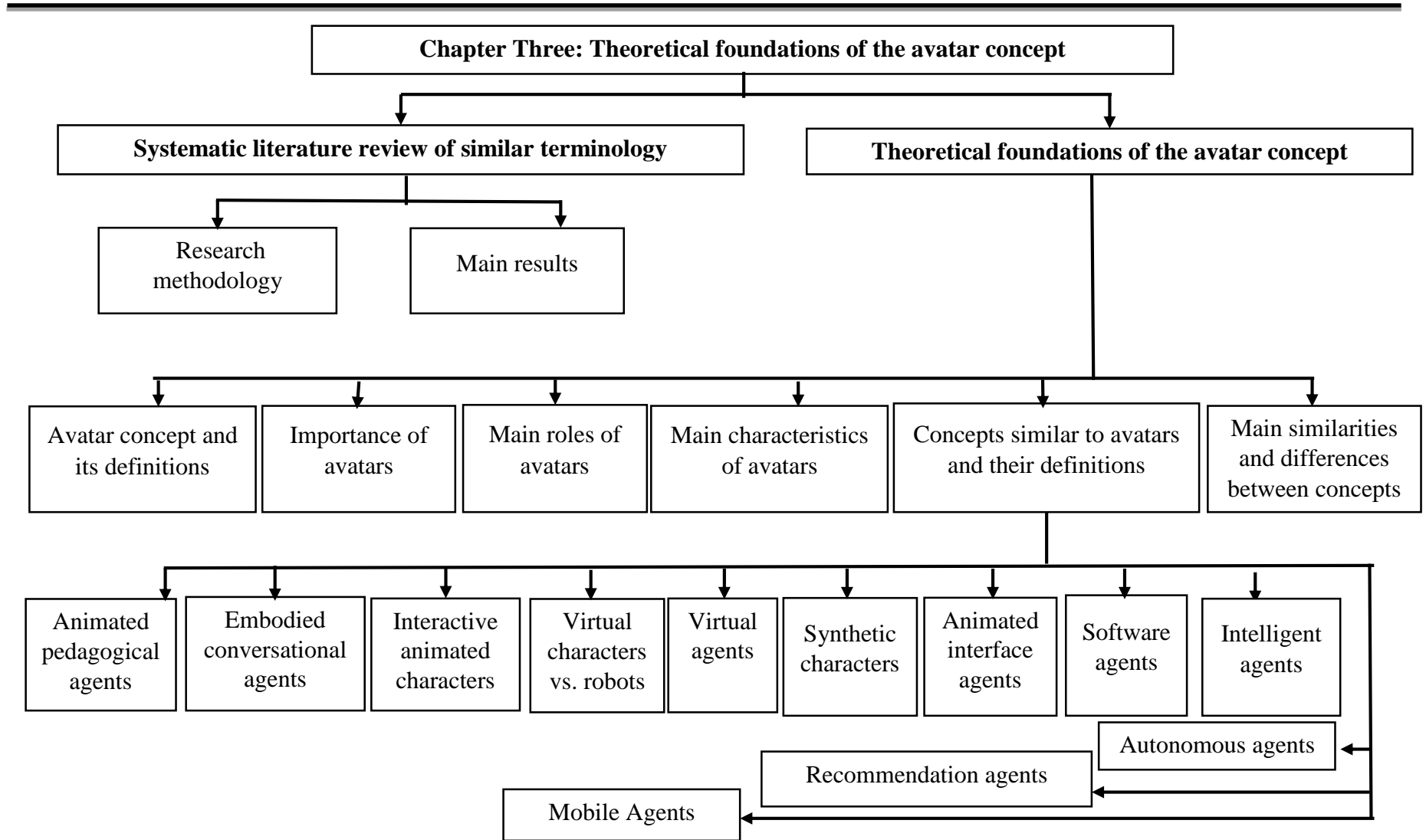


Figure 3. 1 Chapter Three map

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### 3.2.1 *Research methodology*

The same search strategy as in the previous chapter was adapted here. Specifically:

(1) The keywords for the avatar topic focused on similar terms. These keywords, taken from McGoldrick et al.'s (2008) study, included 'embodied conversational agents', 'virtual agents', 'synthetic personae'<sup>8</sup>, 'interactive characters', 'animated pedagogical agents', 'artificial shopping agents' and 'animated interface agents'. In addition, other phrases used in some avatar articles were included in the search, such as 'software agents', 'intelligent agents', 'recommendation agents' and 'mobile agents', to distinguish between the avatar concept and others.

(2) These keywords were constructed using the root search string. For example, this type of search ('embodied conversational agents' OR 'virtual agents' OR 'synthetic personae' OR 'interactive characters' OR 'animated pedagogical agents' OR 'artificial shopping agents' OR 'animated interface agents') was used as secondary method for depicting a comprehensive picture on the avatar concept.

(3) To standardise the search strategy, the same 10 bibliographical databases were used in order to have the greatest coverage of similar avatar terms. These databases are Web of Knowledge/Web of Science, Emerald, ProQuest, Academic Search Premier (EBSCO), Sage Online Journals, JSTOR, IEEEExplore, Scopus, Science Direct and Taylor and Francis.

(4) The review was also limited to a range of years (1993–2013) and published journal articles/peer-reviewed citations. This search was commenced from articles published in 1993 as no worthwhile contributions were found prior to this.

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<sup>8</sup> Synthetic characters can generate behaviours such as communicating with high-level dialogue, using natural cues, expressing and/or perceiving emotions of other characters, exhibiting distinctive personality and character and learning/developing social competencies.

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(5) The articles were selected based on a number of criteria, such as the selected terms being topics not only in the titles, but also included in the business and marketing disciplines. The search — after eliminating the duplicates using Endnote software — resulted in 1621 published articles (see Appendix C.1).

(6) The years were divided into five periods, so that the first period included 14 years, the second period included four years, the third period included two days and the last period include one year. This classification was used for two reasons. First, there is an expectation that the first few years have fewer articles compared to later years. Second, this classification makes the explanation of the results easier. The years were divided in order to show the trends in the number of articles published per period.

(7) The articles in business (excluded marketing) were drawn from journals ranked in the Association of Business School (ABS, 2010). However, all marketing articles were taken into consideration, irrespective of journal ranking. This step limited the articles to 871.

(8) The 871 articles were compared with the results of articles selected in Chapter Two. This process aimed to find and eliminate any duplicates (articles found in both searches). This step limited the articles to 816 articles.

(9) Of the remaining 816 articles, further exclusion criteria were applied to capture the most influential work. These documents were divided into three categories (highly relevant, less relevant, and not relevant) based upon the relevancy of analysed articles to the objectives of the current study (as shown in Appendix C.2).

### **3.2.2 Main results**

Adding Adding criteria of the articles' relevancy to the current study limited the number to 179 highly relevant articles (see Appendix C.3). These results are classified into two categories based on the four periods shown in Table 3.1. The majority of selected articles were published in business journals; only 13 articles were published in marketing journals.

In addition, the positive direction in the scholars' attention to the selected terminologies is evident in the table. The average in each period was determined by dividing the total articles in the period by the number of years in that period. For instance, the average in the first period was 0.75 (12 articles/16 years) whereas the fourth period had the highest average of 17 articles per year. The last part of Table 3.1 shows the increasing rate of the articles examining one of the selected terminologies. This rate can be calculated using the equation: (current average – base average)/ base average. The first period (1993–2006) was used as the base average. The increasing rate of the second period was .83 times  $((11.5-6.29)/ 6.29)$ , meaning the rate of published articles examining the selected terminologies was greater than the base period by about .83 times. Although the rate in the last period (2013) was less than the fourth period (2011–2012), it was still a positive rate.

Period	1993-2006		2007-2010		2011-2012		2013	
Discipline	Busi	Mark	Busi	Mark	Busi	Mark	Busi	Mark
Number of articles	84	4	43	3	29	5	10	1
Total	88		46		34		11	
Average	6.29		11.5		17		11	
Direction of scholar attention/ increasing rate (time)	-----		.83		1.7		.74	

**Table 3. 1 Results of highly relevant articles, average and increasing rate**

This section indentified the articles which included the similar terminology to avatar concept. It showed the search strategy used to identify thses articles and the main results. It is valuable to disucss the theoretical foundations of the avatar concept and showing the main similarities and differences with other terminology related to it.

### **3.3 Theoretical foundations of the avatar concept**

Systems such as computer interfaces can be either embodied — meaning the individual interacts with an animated avatar and sends para-linguistic cues, such as gestures and facial expressions, to complement or enhance the interface's message — or disembodied —



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meaning the human interacts through speech or text entered via a keyboard (Breazeal, 2003).

The use of avatars in the online context is accelerating greatly or dominant in the market (Galanxhi & Nah, 2007; Hershfield et al., 2011; Koontz & Gibson, 2002). In other words, the evidence suggests that the use of avatars has been increasing in a number of contexts, such as commercial websites, virtual communities, online communities and virtual worlds (Bélisle & Bodur, 2010; Gerhard, Moore & Hobbs, 2004; Jin, Sogang, Baker & Song, 2007; Wood & Solomon, 2008), particularly in e-learning contexts (Morrison, Cegielski, & Rainer, 2012). This growth is due in part to providing users with stunning visuals, animations and social communities (Mennecke et al., 2008). Avatars mimic physical human characteristics and actions; for example, the avatar's gaze indicates the direction of looking (Montoya et al., 2011). Avatars are one way that visual information can be added to online communication. Yahoo's avatars demonstrate virtual community members' identities and preferences, along with their postings (Jin et al., 2007; Lee et al., 2013; Vasalou, Joinson, Banziger, Goldie, & Pitt, 2008).

Several companies, such as British Telecom, Coca-Cola, GM, Dell, Sony, IBM, Marks and Spencer and O2, have already started introducing avatars on their commercial websites or virtual world (e.g., Second Life) to improve consumers' experiences and respond to consumers' questions through an interactive touch screen, where anthropomorphised avatars can represent consumers and salespersons (Barlow, Siddiqui, & Mannion, 2004; Harwood & Ward, 2013; Papadopoulou, Andreou, Kanellis, & Martakos, 2001; Wood & Solomon, 2008). Indeed, companies appear to choose the avatars to represent them on their websites; for example, Coke's male-looking digital spokesperson in cartoon form was recently changed to a female-looking photographic form (Wood & Solomon, 2008). A growing number of commercial companies, such as Oddcast, SitePal and Hapttek, have created animated speaking characters that can be added to websites for a range of professional and personal applications (Qiu & Benbasat, 2009).

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Consequently, this section is divided into six subsections: the avatar concept and its definitions, the importance of the avatar and its main roles, main characteristics of avatars, concepts similar to avatars and their definitions and main similarities and differences between these concepts or terminologies (see Figure 3.1).

### ***3.3.1 Avatar concept and its definitions***

This section provides a more detailed exposition of the concept. The word *avatar*, based on the ancient Indian language Sanskrit ‘*avatāra*’ (meaning incarnation), refers to the embodiment of God or God’s appearance on earth as it is believed that he visited earth nine times to curb evil and, during each visit, took a different embodiment, called an avatar (Galaxhi & Nah, 2007; Garnier & Poncin, 2013; Gerhard et al., 2004; Kang, 2006; Vitzthum, Kathuria & Konsynski, 2011). An avatar refers to the representation of an entity (Holzwarth et al., 2006). Computer users are provided with graphical embodiments called avatars which deliver their identity, presence, location, and activities to others (Benford, Greenhaigh, Rodden, & Pycock, 2001). The motivation behind adding avatars is to provide more realism (a believable appearance and realistic human-like movements) that mimics human movements (Luciano, Banerjee, & Mehrotra, 2001).

As a prelude to the discussion on the current definitions of avatars in the literature, all the descriptions of avatars stated in the selected previous studies are summarised in Table 3.2 and Figure 3.2 to enhance the understanding of the avatar concept. Avatars are described in different ways. For example, they are described as a window shop (Hemp, 2006) or digital persona (Oyedele & Minor, 2011), graphic images or symbols (Morrison et al., 2012), and mask of the individual/user (Parmentier & Rolland, 2009). They are also virtual representations (Hornik & Thornburg, 2010; Kaplan & Haenlein, 2009), digital or visual representations of users (Animesh, Pinsonneault, Yang, & Oh, 2011; Bonifield & Tomas, 2009; Hansen, 2009; Stanoevska-Slabeva, 2002; Ward, 2010; Wood & Solomon, 2008), and personal three-dimensional representations of a body (Blodgett & Tapia, 2011). An

avatar can also be described as a free consumer (El Kamel & Rigaux-Bricmont, 2011), which results from the symbolic negotiation of appearance choices (Hansen, 2009). Figure 3.2 shows a mental map that captures all these descriptions in a simple and readable way that is easy to understand. For instance, the word *digital* is linked, as stated in the literature, with other words, like *persona*, *item*, *proxy* and *human character*.

<b>Avatar descriptions</b>	<b>Author(s)/ source</b>
Alternate channels of emotional communication.	Bailenson et al., (2007)
A virtual human shop.	Barlow et al., (2004)
A static picture and a dynamic cartoonish character.	(Bélisle & Bodur, 2010)
A digital persona Virtual representations of users' selves or alter egos.	(Berthon et al., 2010)
Graphical humanoids	(Bishop, 2009 cited in Ke et al., 2012)
A representation of the user's ego.	Brown et al., (2011)
Vehicle of the self	(Castronova, 2003, p.5 cited in (Kohler et al., 2009)
Graphical embodiments of remote users	(Clayesa & Anderson, 2007)
The expression of a divided self and a free self. The consumer expresses a self-concept. The experience of an invented self.	(El Kamel & Rigaux-Bricmont, 2011)
An expression of identity	(Garnier & Poncin, 2013)
A computer user's representation of him/ herself. An alter ego, in the form of a 3D model.	Halvorson et al., (2012)
Graphical representations of users	Harwood & Ward, (2013)
Window shop.	Hemp (2006)
Digital representations of people	Hershfield et al., (2011)
A graphical representation of computer users. As symbols for users. As symbols of online identity.	(Kang, 2006)
Interactive representations of sales assistants on retail	( Keeling et al., 2010)
Symbolic presentation Graphical digital items support image creation. Digital items for identity.	(Kim et al, 2012)
Self-identified as a user.	MacKenzie et al., (2013)
An embodied representation of the social actor. As a bodily form used as a tool. An embodied representation.	Mennecke et al., (2011)
A video game character. A pictorial representation on a social network. Visual representations (e.g., pictures of users).	Mennecke & Peters, (2013)
Graphic images or symbols.	Morrison et al., (2012)
The human-like articulated character. A cartoon image. Digital proxies.	Mueller et al., (2011)

Graphical representations of users.	Neviarouskaya et al., (2010)
Humanlike digital characters.	Oyedele & Minor, (2011)
A representation of the user.	Paiva et al., (2001)
Virtual persona.	Schwarz et al., (2012)
Online personas.	Vitzthum et al., (2011)
Virtual characters.	Wang et al., (2007)
Lifelike characters created by technology.	

**Table 3. 2 Descriptions of avatars**

Avatars in virtual worlds are far more advanced and complicated than those used on traditional websites (Berthon, Pitt, Halvorson, Ewing, & Crittenden, 2010; Jin & Bolebruch, 2009), as software is used to create the persons' avatars (Berthon et al., 2010). Based on the literature reviewed, no consensus exists on the definition of the avatar concept. Table 3.3 shows the definitions included in the selected articles of this research, demonstrating both the author(s) of the definition and the authors' citations and sources. Avatars are an online self-identity based on an alter ego (Hemp, 2006; Kang, 2006; Rhee, Sanders, & Simpson, 2010) to enable better identification of the speaker via the integration of gestures and auditory evidence (Brown, Recker, & West, 2011). Confirming the lack of consensus on one or more definitions, Figure 3.3 shows that the most commonly used definitions of avatar are those of Holzwarth et al. (2006) and Bahorsky et al. (1998), which were used only three times in their own and others' studies.

Finally, it is important to distinguish among three concepts: avatar, character, and persona. At the avatar level, where users start, it is more like 'operating puppets'. A character is an extension of the user's self, a whole personality for the user and the persona; the users no longer differentiate between themselves and the avatars (Eladhari, 2007, as cited in Belk, 2013).

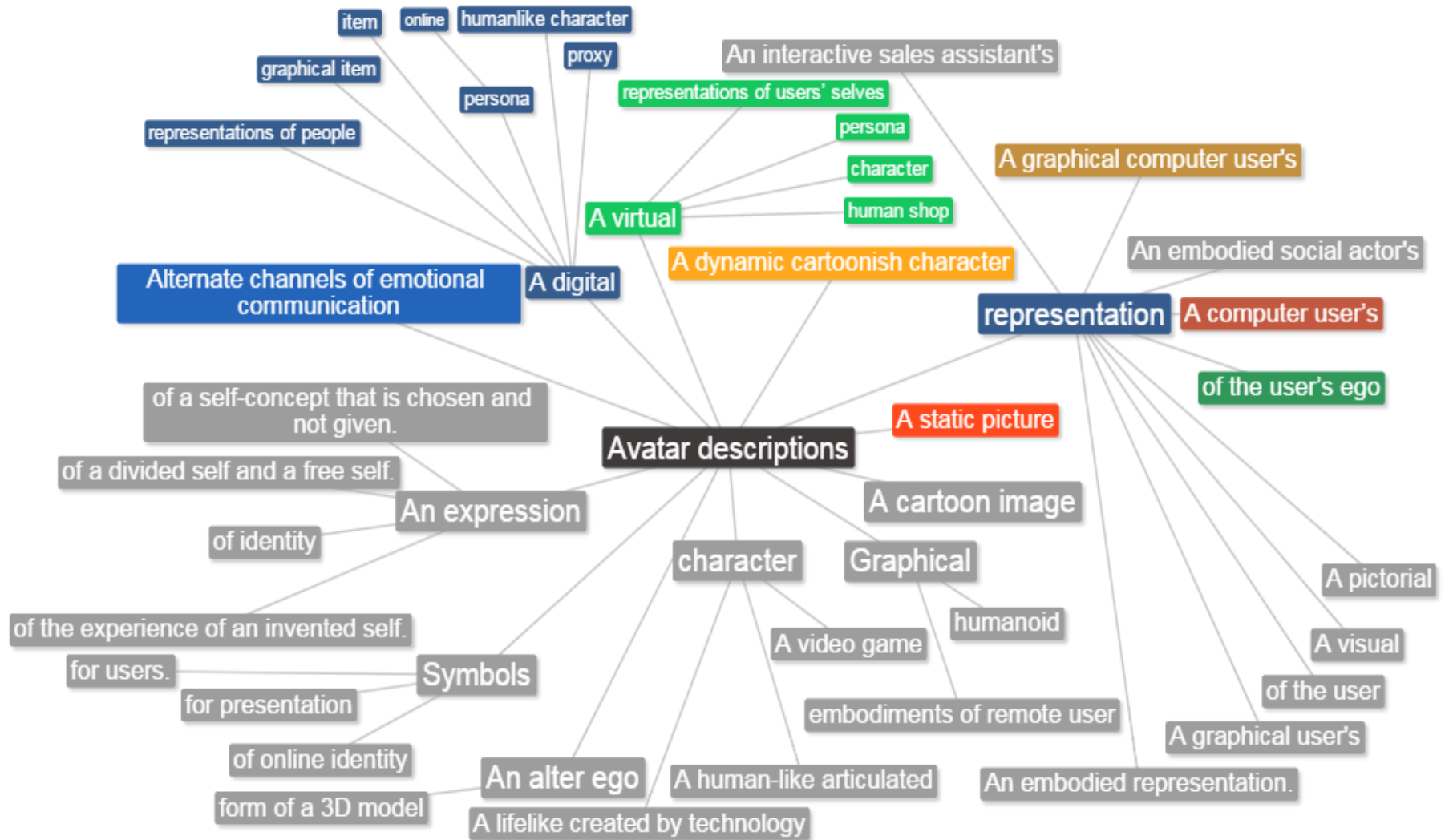


Figure 3. 2 Avatars descriptions

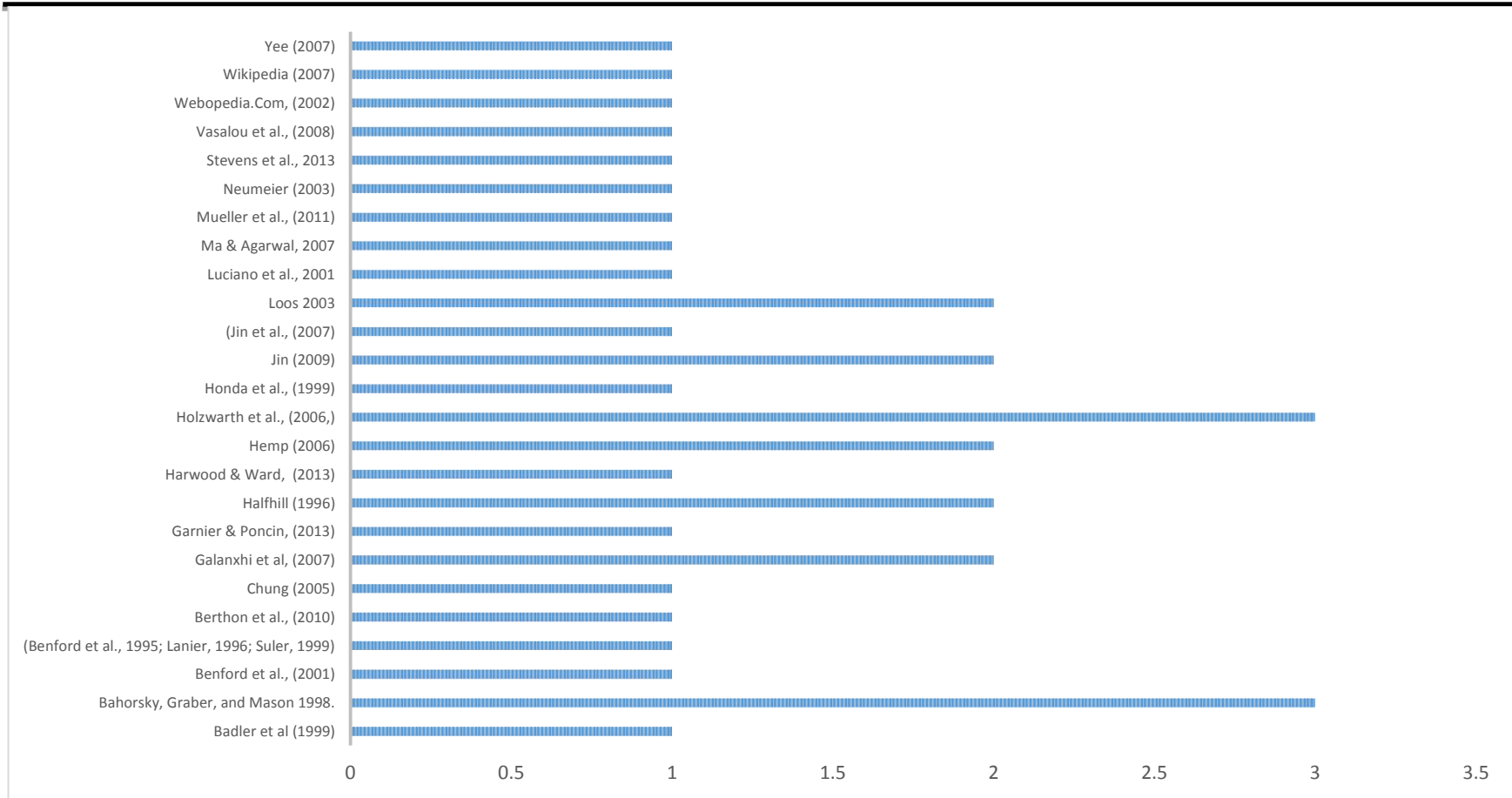


Figure 3. 3 Avatar definitions used rate

Author(s)	Definition	Source
<b>Badler et al (1999)</b>	Real-time virtual humans controlled by real humans.	Badler et al., (1999: 68)
<b>Bahorsky, Graber &amp; Mason (1998)</b>	A pictorial representation of a human in a chat environment.	(Holzwarth et al., 2006; Poncin & Garnier, 2012; Schau & Gilly, 2003)
<b>Benford et al., (2001)</b>	Graphical embodiments.	(Benford et al., 2001)
<b>(Benford et al., 1995; Lanier, 1996; Suler, 1999)</b>	Pictures, images or icons that users choose to represent themselves.	Kang, (2006)
<b>Berthon et al., (2010)</b>	An individual's persona in the virtual world that is a human behind it, making avatar behavior live and spontaneous.	Berthon et al., (2010)
<b>Chung (2005)</b>	Graphic icons representing users through various forms	Vicdan & Ulusoy, (2009)
<b>Galanxhi et al., (2007)</b>	Electronic representations of human beings that one may use in communicating with others.	(Galanxhi et al., 2007; Kohler et al., 2009)
<b>Garnier &amp; Poncin, (2013)</b>	A static or animated graphic representation (often a character) of the internet user or a video game.	Garnier & Poncin, (2013)
<b>Halfhill (1996)</b>	Graphic personifications of computers or processes that run on computers.	(Holzwarth et al., 2006; Poncin & Garnier, 2012)
<b>Hemp (2006)</b>	Broadly defined, "encompasses any visual representation of a user in an online community.	(Hemp, 2006; Jin et al., 2007)
<b>Holzwarth et al., (2006,)</b>	General graphic representations that are personified by means of computer technology.	(Bélisle & Bodur, 2010; Berthon et al., 2010; Holzwarth et al., 2006)
<b>Honda et al., (1999)</b>	An indispensable with the system that utilizes the idea of virtual space to realize a community.	Honda et al., (1999)
<b>Jin (2009)</b>	A computer-generated visual representation of a user, can be customized to fit any desired appearance.	(Jin & Bolebruch, 2009; Jin & Sung, 2010)
<b>Jin et al., (2007)</b>	Internet users' graphical representations of themselves in virtual environments.	Jin et al., (2007)

<b>Loos 2003</b>	A representation of the user as an animated character in virtual worlds.	(Holzwarth et al., 2006; Poncin & Garnier, 2012)
<b>Luciano et al., (2001)</b>	Are merely basic nonhuman- like representations in most existing systems.	Luciano et al., (2001)
<b>Ma &amp; Agarwal, 2007</b>	A visual symbol that usually reflects some personality.	Ma & Agarwal, (2007)
<b>Mueller et al., (2011)</b>	Visible images of the people involved.	Mueller et al., (2011)
<b>Neumeier (2003)</b>	The virtual DNA of a brand; ...an icon that can move, morph or otherwise operate freely as the brand's alter ego." (from a brand management perspective)	Wood & Solomon, (2008)
<b>Stevens et al., (2013)</b>	An animated head displayed on the screen.	Stevens et al., (2013)
<b>Vasalou et al., (2008)</b>	A pictorial representation of the body.	Vasalou et al., (2008)
<b>Webopedia.Com, (2002)</b>	A graphical icon that represents a real person in a cyberspace system.	Koontz & Gibson, (2002)
<b>Wikipedia (2007)</b>	Represented in the form of two or three-dimensional graphical representations of humanoids.	Tikkanen et al., (2009)
<b>Yee (2007)</b>	Digital representations of ourselves.	Belk, (2013)

**Table 3. 3 Avatar concept's definitions**



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### 3.3.2 Importance of avatar and its roles

Avatars provide new ways for users to interact with their computers/websites (Gerhard et al., 2004). The importance of the avatar concept can be raised from different aspects.

**Avatars as an element in the virtual environment:** An avatar is one of the most important basic elements in the virtual world (e.g., Second Life and World of Warcraft, collaborative virtual environments). The avatars are strongly related and important to the virtual worlds (Bullingham & Vasconcelos, 2013; Gerhard et al., 2004; MacKenzie, Buckby, & Irvine, 2013) where the most distinctive feature in virtual worlds is the people present in the form of avatars who communicate with each other (Animesh et al., 2011; MacKenzie et al., 2013; Suh, Kim, & Suh, 2011). The majority of virtual world definitions include 'avatar'. For example, virtual worlds are platforms where users can appear in the form of avatars and interact with each other as they would in real life (Muzellec, Lynn, & Lambkin, 2012). Avatars are three-dimensional representations of the users within virtual worlds (Halvorson, Ewing, & Windisch, 2011). Avatars are digital representations of themselves and simulated bodies in virtual worlds (Nah, Eschenbrenner, & DeWester, 2011). The use of avatars allows individuals to represent themselves better by imitating facial expressions and nonverbal cues or behaviours (Li, D'Souza, & Du, 2011; Neviarouskaya, Prendinger, & Ishizuka, 2010). They become extended selves of the users and residents in the virtual world (Animesh et al., 2011; Vitzthum et al., 2011) to increase the personality of context (Schultze, Hiltz, Nardi, Rennecker, & Stucky, 2008). The virtual worlds, including Second Life, are virtual environments that enable multiple users to simultaneously access, interact and represent themselves through avatars (Bullingham & Vasconcelos, 2013; El Kamel & Rigaux-Bricmont, 2011; Li et al., 2011) or electronic environments where individuals can interact in a realistic manner in the form of avatars (Mueller, Hutter, Fueller, & Matzler, 2011). Virtual worlds provide a shared three-dimensional environment where the avatars can interact and freely navigate (Bélisle & Bodur, 2010; Mueller et al., 2011).

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Avatars are visual representations of users in virtual worlds which can closely resemble humans, animals or other mythical creatures (Melancon, 2011; Vitzthum et al., 2011). It is free for users to join the Second Life virtual world and create an avatar (Halvorson et al., 2012). A number of companies have created avatars to represent them in virtual worlds, including IBM, IMAX, Nissan, Pepsi and Wells Fargo (Berente, Hansen, Pike, & Bateman, 2011; El Kamel & Rigaux-Bricmont, 2011; Melancon, 2011). Avatars in virtual worlds have been widely adopted in such areas as advertising and consumer behaviour (Suh et al., 2011). Second Life consumers have to create and develop their avatars (El Kamel & Rigaux-Bricmont, 2011). The companies populate human-like avatars that can interact with visiting consumers 24 hours/7days (Oyedele & Minor, 2011). Avatar shoppers can explore any virtual worlds linked through an online store (Koontz & Gibson, 2002). However, users still lack expertise operating avatars in manipulating a range of motion in their movements (Saunders, Rutkowski, van Genuchten, Vogel, & Orrego, 2011).

**Avatars as a tool on websites:** Using anthropomorphic avatars offers new ways for users to interact (Galanxhi & Nah, 2007) as they convey a sense of presence (Larach & Cabra, 2010). It can be argued that this occurs due to the advantage of visual speech when an avatar is a human (Stevens, Gibert, Leung, & Zhang, 2013). Avatars ground the websites with physical references (Schau & Gilly, 2003). They improve social interactivity (Neviarouskaya et al., 2010; Saunders et al., 2011) or socialisation with others (Halvorson et al., 2012; Poncin & Garnier, 2012; Schultze et al., 2008; Sutcliffen & Alrayes, 2012; Wood & Solomon, 2008). In addition, they are critical for evoking an emotional response in the users (Whitton, 2003) or rich emotional messages (Takahashi, Bartneck, Katagiria, & Arai, 2005) to ensure richer manifestations of the virtual community member (Jin et al., 2007) and appropriately large amounts of information (Lee, Kozar, & Larsen, 2005).

**Avatars as an element in e-commerce:** The use of avatars is applicable to e-commerce and a wide range of business applications online (Galanxhi & Nah, 2007). Avatars deliver

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companies with a representational rich-mediated setting that enables direct and rich interactions with consumers (Kohler, Matzler, & Fuller, 2009). Consumers want assistance (avatar) in the shopping environment as the online companies are impersonal, particularly in unfamiliar or complex product categories; thus, avatars can deliver the product information to consumers (Holzwarth et al., 2006). E-retailers need to identify precisely the specific needs for interaction in order to gain the potential advantages avatars can offer (Keeling, McGoldrick & Beatty, 2010). Avatar-enabled shopping could act as a facilitator for e-commerce (Jin et al., 2007), enhance social interactions between companies and consumers (Tikkanen, Hietanen, Henttonen, & Rokka, 2009) and give websites more of a human touch when assisting consumers (Galanxhi & Nah, 2007). In addition, as avatars are means of engagement and interaction (Franceschi, Lee, Zanakis, & Hinds, 2009; Parmentier & Rolland, 2009; Schultze et al., 2008; Stevens et al., 2013), as companies should have appropriate avatars to attract more users (Tikkanen et al., 2009). Marketers through their spokes-avatars' personalities can increase the persuasiveness of brand communications and the brand's credibility (Jin & Sung, 2009).

**Avatars as a marketing tool:** The avatar concept has been increasingly influential for the marketing discipline and its strategies. In other words, one of the recent trends in marketing is to include facial recognition technologies for avatars when creating the virtual representations of companies and how they manage their relationships with consumers (Mennecke & Peters, 2013). Marketers and the marketing scholars have scarcely begun to explore the avatars opportunities of marketing (Gardner, 2006; Hemp, 2006). Hemp (2006) was the first author to introduce the concept of avatar-based marketing, highlighting the range of marketing activities taking place in them (Ward, 2010). Marketers need to be familiar with the concept of avatars and consider whether it entails a rethinking of marketing strategies that avatars can create and place ads for other businesses (Hemp, 2006; Melancon, 2011). Companies are increasingly using avatars (Galanxhi & Nah, 2007) and spend

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hundreds of thousands of dollars to choose and validate avatars for advertising campaigns in online formats; creating an avatar helps develop a better understanding of avatar-based marketing (Ward, 2010; Wood & Solomon, 2008). In addition, considering avatars and other online personae as a new set of potential consumers, they should be analysed and segmented, providing a useful lens for identifying marketing opportunities (Gardner, 2006). Using avatars potentially entails several useful properties within the online environment, such as presence, identity, subordination, authority, and social facilitation (Gerhard et al., 2004). They also help reduce the constraints of presence in the online context by giving a natural and appropriate sense through their movements, reactions and interactions (Badler, Palmer & Bindiganavale, 1999). Providing avatars with a human shape helps users easily understand the intentions via their nonverbal cues, such as posture, direction of gaze, body action and expression (Honda et al., 1999). Finally, avatars do not get tired; thus, they do not need to sit (Schultze et al., 2008).

Avatars play several roles, as summarised in Table 3.4 and Figure 3.4. Avatars are mainly used for representation and self-presentation (Franceschi et al., 2009; Hansen, 2009; Larach & Cabra, 2010; Parmentier & Rolland, 2009; Tikkanen et al., 2009) and are increasingly used as companies' representatives on commercial websites and in virtual environments (Holzwarth et al., 2006; Jin & Sung, 2009). Users also portray themselves as avatars on social networking sites (Hansen, 2009). Companies have developed and applied avatars to commercial or retail websites as communicators, sales assistants endorsers, sales agents, online assistants and store assistants (e.g., Anna at IKEA; Lisa at Marks and Spencer) to enhance the interpersonal communication (Bélisle & Bodur, 2010; Jin & Sung, 2009; Keeling et al., 2010; McGoldrick et al., 2008; Lee et al., 2005; Wang et al., 2007). They also deliver product information in an attempt to generate revenue (Hemp 2006; Holzwarth et al., 2006). Avatars can explain the organisation's products and services (Grapentine, 2010). They can portray companies as they wish to be (Badler et al., 1999). They can be

used for help when making online purchase decisions (Wood & Solomon, 2008). Avatars can also effectively represent participants on some occasions (Benford et al., 2001). Retailers and marketers can track the behaviours and clicks of avatars in the virtual world (Schiller, Goodrich, & Gupta, 2013). Users consider their avatars to be a true replica or extension of themselves in the virtual world (Parmentier & Rolland, 2009). Moreover, avatars are used to take virtual university courses, participate in corporate training programmes, share reactions to new products, and of course shop (Wood & Solomon, 2008). Avatars can do five communicative functions: greeting, thanking, posing a question, congratulating and saying farewell (Neviarouskaya et al., 2010). The spokes-avatars' roles shape consumers' experiences and the persuasion process (Jin & Sung, 2010).

Avatars roles	Source
Online shopping assistants	(Holzwarth et al., 2006 cited in Florenthal & Shoham, 2010; Jin & Sung, 2009)
The online identity of the users	(Galanxhi et al, 2007; Hansen, 2009; Vasalou et al., 2008)
Own 3D 'alternative self'	(Parmentier & Rolland, 2009) (Barnes & Mattsson, 2011)
Social role of an online sales assistant.	(Holzwarth et al., 2006 cited in & Keeling et al., 2010)
An intermediary between the individual and the community.	(Taylor, 2003 cited in Galanxhi & Nah 2007)
Doing two functions: a recommendation function and control function (decision support system (DSS) mechanism).	Lee & Chung, (2005)
As intermediaries.	Vahidov, (2005)
Personal intermediaries	Sutcliffen & Alrayes, (2012)
The broadcast model (used for broadcasting news or other information). The personal assistant model (perform a variety of tasks at specific times). Digital disguises (originally used in gaming and can assume identities).	(Dibbel 2003 cited in Galanxhi, & Nah, 2007)
The helper role (giving instructions by means of audio and text). Catch the attention of the users in order to make them follow the instructions given by the avatar.	Castilla et al., (2013)

Facilitate consultations.	Koontz & Gibson, (2002)
As Identification figures, Personal shopping assistants, Web site guides, Conversation partners.	Holzwarth et al., (2006)
Users' representation.	Wasko et al., (2011)
Provide a tangible representative form of the user.	Gerhard et al., (2004)
An avatar as a clerk or customers or sellers	Hemp, (2006)
Avatars seen as customers	MacKenzie et al., (2013)
An avatar becomes a source of meaning for individuals Avatar as a mediator	Poncin & Garnier, (2012)
An avatar as free consumer, object of consumption or as subject of consumption.	El Kamel & Rigaux-Bricmont, (2011)
An avatar assistant for retail websites.	Keeling et al., (2010)
Helper, solving problems and labour saving Friendly, sociable, welcoming host Personal shopper and recommending agent Online assistants on transactional websites.	McGoldrick et al, (2008)
The nexus of communication. Filtering all verbal and nonverbal communication cues.	Mennecke et al., (2011)
An endorsers (spokespersons) of the brand. Marketers can use an avatar in a decision support system. Using avatars in online advertising and customer support. Company or brand representatives, Personal shopping assistants, Conversation partners, Recommendation agents, Persuasion agents.	(Holzwarth et al., 2006 cited in & Jin & Sung, 2010)
As recommendation agents An interactive advertiser in an advergaming. In Second Life, consumers' navigators and viewers. Representatives to their brand and product.	Jin & Bolebruch, (2009)

**Table 3. 4 Avatars' roles**

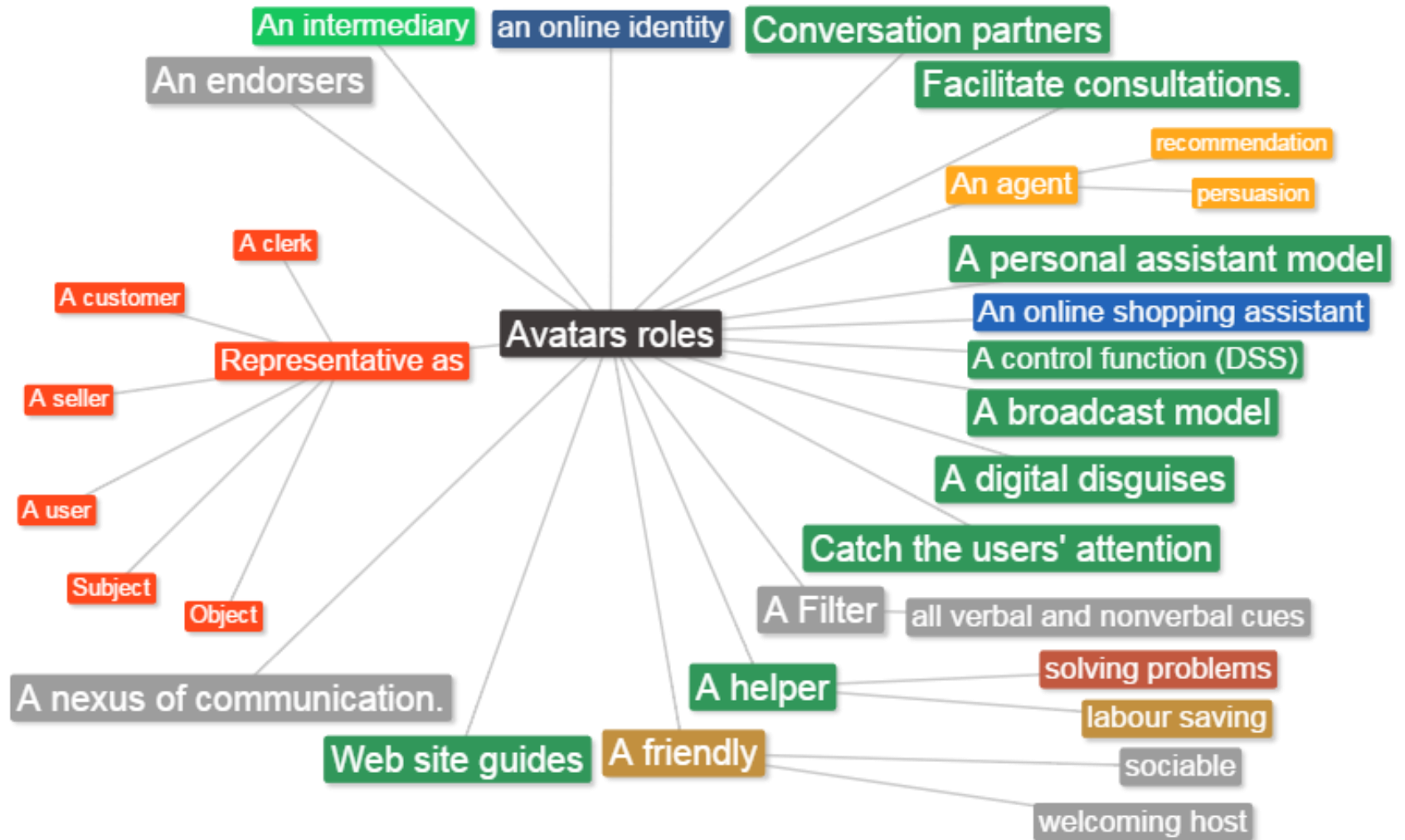


Figure 3. 4 Avatars' roles

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### 3.3.3 *Main characteristics of avatars*

The previous studies identified a number of characteristics related to avatars. As shown in Table 3.5, for instance, avatars can be characterised through five aspects: appearance (e.g., two or three dimensional), function (e.g., cartoon, skills), time (e.g., offline animation, interactive manipulation), autonomy (e.g., interacting, reacting and making decisions), individuality (e.g., personality, gender and age) and control (Badler et al., 1999). Avatars are sometimes not animated or are static (Koontz & Gibson, 2002; Morrison et al., 2012), which are often used in online text-only chats (Morrison et al., 2012); they can also be animated avatars that have a humanoid form (Holzwarth et al., 2006; Morrison et al., 2012; Smith, 2002). Avatars do not always have to appear human; they are sometimes human, animals or objects (Blodgett & Tapia, 2011; Melancon, 2011; Smith, 2002). Communicative gestures can be conveyed via an avatar's appearance (Vasalou et al., 2008). Avatars can be conversational or use only monologues (Nishida, 2002). They can make a gesture of typing (Goel, Johnson, Junglas, & Ives, 2011). Users can personalise an avatar by changing its colour, clothing, and facial expression based on their preferences and emotional status (Lee et al., 2005). Companies use different avatars to serve different segments such as Ikea's avatar Anna, which is represented as a brown-haired avatar on the U.S. website while she is depicted as a blonde avatar on the U.K. website (Bélisle & Bodur, 2010). The 'avatarisation' of a human identity can integrate specific skills or characteristics that may be the same as or similar to the attributes of its real-world creator (MacKenzie et al., 2013). Figure 3.5 summarises the main characteristics of avatars.



Characteristics	Source(s)
<p>Appearance (e.g. 2D drawings, 3D wireframe, 3D polyhedra, curved surfaces, accurate surfaces and physiological effects).</p> <p>Function ( e.g. cartoon, jointed skeleton, joint limits, strength limits, fatigue, hazards, injury, skills, psychological models, cognitive models and teaming,).</p> <p>Time (e.g. off-line animation, interactive manipulation, real-time motion playback, multiple agents and crowds).</p> <p>Autonomy (e.g. interacting, reacting, making decisions, communicating and taking initiative).</p> <p>Individuality (e.g. Generic character, hand-crafted character, personality, gender, age and specific individual).</p> <p>Controlled by real humans</p>	(Badler et al.,1999)
Avatars convey identity, presence, and activities to others”	(Benford et al. 2001 & Hemp 2006 cited in Jin et al., 2007)
An avatar has a nickname selected by the person behind an avatar.	(Berthon et al., 2010)
Well-known cartoon characters or celebrity look-a-like characters. a humanoid cartoon-like character	(Bogdanov et al., 2013; Gerhard et al., 2004)
An avatar ‘mimics’ a user’s emotional expressions (anger, joy and sadness).	(Castellano & Mancini 2009 cited in Lopez-Colinon & Jose´ Cola´s, 2012)
3-D characters	Cooke & Macfarlane, (2009)
An avatar may take on the appearance of an imaginary entity such as a furry, a vampire, a fantastic creature, etc.	El Kamel & Rigaux-Bricmont, (2011)
<p>An avatar can walk, run, fly</p> <p>An avatar can point to things, grasp things, and move things around.</p> <p>An avatar can Make gestures body language responses or actions (i.e. a wave hello).</p>	(Franceschi et al., 2009; Hornik & Thornburg, 2010)
An avatar can take a variety of forms (including male, female, neutral, animals, cartoons, or some hybrid form) present visual and social cues	Galaxhi & Nah, (2007)
<p>Avatar characteristics can be divided into six categories namely technical options and personalization strategies, avatar realism, anthropomorphism and avatar appearance (aesthetics, androgyny, homophily, attractiveness), avatar credibility, avatar relevance and avatar valence/affordance.</p> <p>Animated, controlled (movements, changes of scene, reactions and expressions) by the internet user.</p>	(Garnier & Poncin, 2013)
<p>Avatars can cater for bodily identity.</p> <p>Avatars can talk to each other.</p>	(Gerhard et al., 2004)

An avatar moves toward, or away from	(Goel et al. 2011)
Avatars moved from one parcel to another	(Halvorson et al., 2012)
Conversational (simple conversation)	(Hansen, 2009; Hornik & Thornburg, 2010; Parmentier & Rolland, 2009)
Name of an avatar (e.g. Robins Hermano)	(Hornik & Thornburg, 2010)
Avatars can have clothing, hairstyles, or other accessories	Jin et al., (2007)
Expressed by graphic images and writing style, repeated use of name and self-description. Ideal, imaginary and fantastic avatars in cyberspace.	Kang, (2006)
Avatars can have different characteristics in terms of self-identity and self-disclosure in different media.	
All the participants are referred to by their avatar names.	Lally & Sclater, (2013)
The avatars can be human, or animal, or machine (e.g. robots).	
The degree of representational detail and complexity (ranging from simple 2D icons to elaborate 3D characters )	Larach & Cabra, (2010)
Customizable features of avatars (e.g. facial expressions, skin colour, hairstyle, and clothes, etc.), emotional facial expressions of the avatar	Lee et al., (2013)
Facial expressions and vocal intonation to the rapist's textual information (an anthropomorphic avatar). Various features should be taken into consideration (its face, skin type, skin colour, voice, hair, make-up, accessories, background, and its facial expression).	Lisettia et al., (2003)
Own photos (present appearance cues that are more physical). Identity information about a user (such as photos, background, experience, interests, and habits).	Ma & Agarwal, (2007)
Users control an avatar's appearance and actions.	Mennecke & Peters, (2013)
Anthropomorphic, Gendered, Three-dimensional computer models.	Michon & El Antably, (2013)
avatars look much like their real world appearances.	Partala, (2011)
express emotions and attitudes	Pollach, (2008)
Humanlike characteristics (e.g. facial expressions, speech output, body gestures, auditory and kinesthetic feedback, human emotions) Social intelligence (i.e., emulations of common social conventions). Linguistic capabilities.	Qiu & Benbasat (2009)
Computer generated characters. Artificial impersonations of human participants.	(Roehl, 1995 cited Papadopoulou et al. 2001)

Visualised. Programmed (to perform gestures, express feelings and act as humans)	
Avatars can move in multiple directions. Avatars may walk around the tool area. Avatars can use a range of motions to move forward, backward, right, or left on the voting floor. Avatars are aware of their height and that of the other avatars.	Saunders et al., (2011)
Access to the expressive capacities of the body (e.g. positioning themselves with respect to others, making gestures, and making the interactions feel more like “real”/face-to-face interactions).	Schultze et al., (2008)
Avatar communications for “greeting, playing, signalling group affiliation, conveying opinions or feelings, creating closeness and dealing with conflict”	Sutcliffe & Alrayes, (2012)
Animation of the avatar. For example, the avatar will wave its arms and smile and speak “Hello” use body language and facial expressions in their messages A message is composed of any number and order of five different components: speech, animation, distance, reference and pointing.	Takahashi et al., (2005)
Some avatars can be complex animated figures that can mimic the movement, speech, and responses of humans.	(Taylor, 2001 cited in Morrison et al., 2012)
Created by social cues (spoken language, social roles, voice, and interactivity).	Wang et al., (2007)
Programmed (a range of responses to the speaker, varying from high levels of interest to outright hostility)	Whitton, (2003)
Function (decorative or proactive). Action (animated or motionless). Representation (photograph/ illustration of real person or imaginary character).	Wood & Solomon, (2008)

**Table 3. 5 Avatars characteristics**

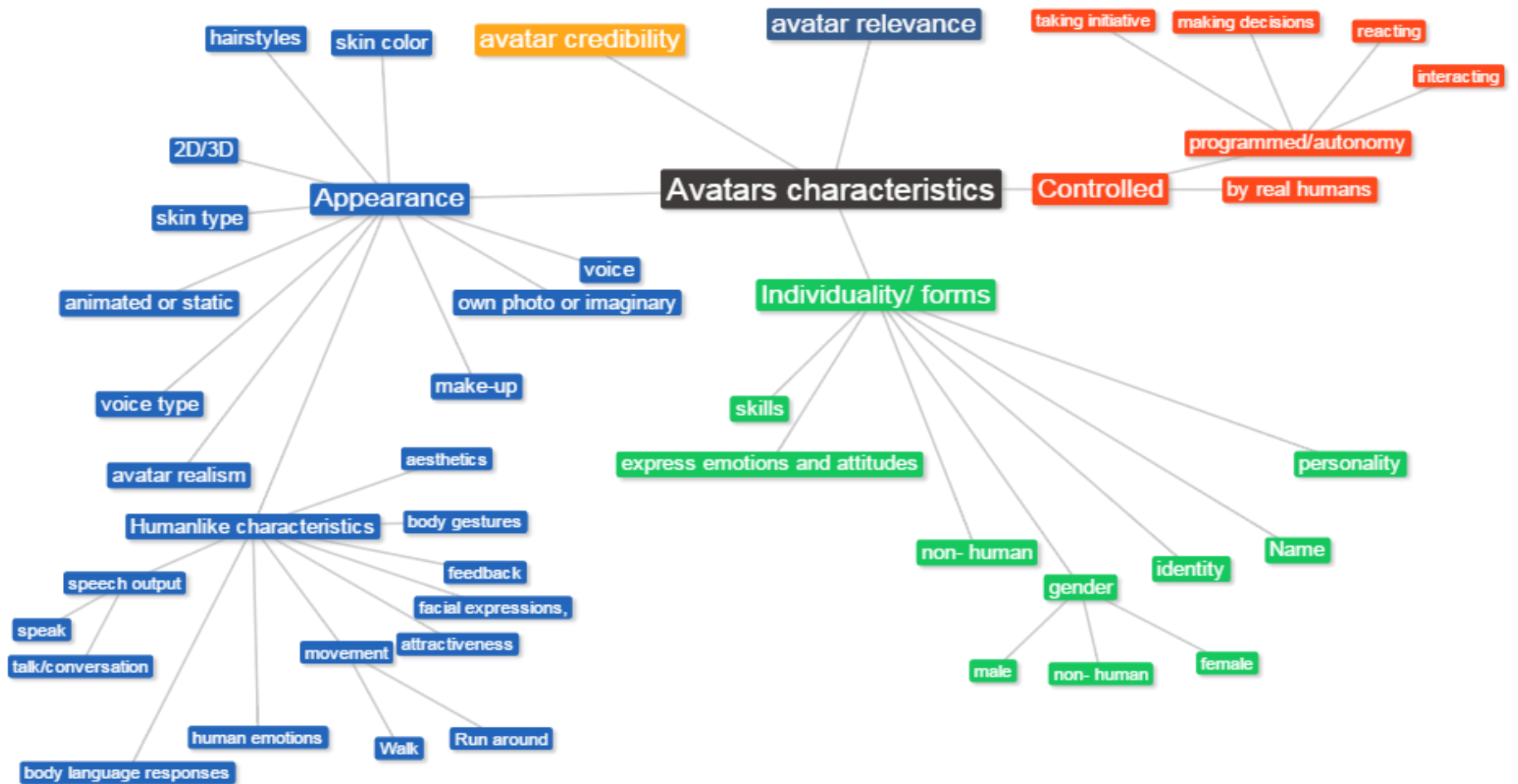


Figure 3. 5 Summary of avatar characteristics

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Based on their literature review, Garnier and Poncin (2013) classified avatars into five categories: static image avatar, generic avatar, gaming avatar, virtual world inhabitant avatar and virtual model. Static image avatars are static icons (pictures or images) which symbolise the users. Users choose them or create the image. They are usually found in forums, instant messaging, mail messaging, two-dimensional social networks and online merchant sites. Generic avatars are a graphic representation of the internet user on the site; they are used to move among the site/virtual universe. They have different degrees of personalisation and options (body, face, and clothing) according to the proposed tool. In addition, they are animated and controlled by the internet users, moving and gesturing. They are seen in three-dimensional galleries, virtual visitation universes (museum, city, tourism, art gallery) and virtual training universes. Gaming avatars are graphic representations of gamers through a character, whether human or not. They have also different degrees of personalisation and options (body, face, and clothing) according to the proposed tool and are animated and controlled by internet users, moving and gesturing. They are often used in massively multiplayer online role playing games (MMORPG) and online simulation games, both solo and social. Regarding the virtual world inhabitant avatars, they are graphic representations of the internet user in virtual universes, metaverses or three-dimensional social networks and have different degrees of personalisation and options (body, face, and clothing) according to the proposed tool. In addition, they are animated and controlled by the internet users, moving (arrows or mouse clicks) and gesturing. They are used in two- or three-dimensional virtual worlds and three-dimensional social networks. Finally, virtual model avatars are graphic representations of consumers on a merchant website. They have different degrees of personalisation and options (body, face) according to the proposed tool. They are also animated and simply controlled by model rotation. They appear on online shopping websites.

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**Marketing avatar (mavatar):** According to Mennecke and Peters (2013), unlike avatars representing those identifiable embodied and facial characteristics (i.e., biometric indicators), marketing avatars represent the identity including the biometric characteristics of the target's face and body and the behavioural profile from the perspective of the seller or outsider. In other words, the users project their personae to the avatars, whereas the mavatars describe embodied personae or the application of using the biometric data for marketing and similar user applications and functions. Mavatars are more than just biometric data; they are, the 'package' for building a biometric profile associated with the user's personal profile of preferences, behaviours and history (Mennecke & Peters, 2013).

### ***3.3.4 Similar concepts that are similar to avatar and their definitions***

Anthropomorphised avatars can represent consumers and salespersons (Papadopoulou et al., 2001; Qiu & Benbasat, 2009). The literature includes a number of terms similar to the avatar concept, some of which authors have used interchangeably with avatars while others are different (Nunamaker, Derrick, Elkins, Burgoon, & Patton, 2011). For example, avatars are also labelled as autonomous agents, animated agents, embodied agents, and virtual agents (Bélisle & Bodur, 2010). Therefore, it is better to discuss these terms in more detail to differentiate between them and avatars.

#### ***3.3.4.1 Animated pedagogical agents (APA)***

Animated pedagogical agents are a new paradigm for learning environments which support students' learning activities (Johnson et al., 2000; Xu & Wang, 2006). In other words, animated pedagogical agents are an example of avatars in multi-user virtual environments, providing more enhanced and natural e-learning platforms or environments (Holz et al., 2011; Qiu & Benbasat, 2009; Sanchez & Garcia-Rodicio, 2008; Visschedijk, Lazonder, van der Hulst, Vink, & Leemkuil, 2013). Animated pedagogical agents are distinguished from other agents such as virtual characters, intelligent agents, conversational agents and social

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agents because pedagogical agents focus on supporting learning and instruction (Veletsianos & Miller, 2008). Pedagogical agents are defined as conversational virtual characters working in the electronic learning environments to serve numerous instructional goals (Veletsianos & Miller, 2008). Animated pedagogical agents or assistants (e.g., anthropomorphised with human-like appearance and using animated talking heads and voices) can suggest improvements through social interaction with some kind of assistance or aids (Sanchez & Garcia-Rodicio, 2008; Slotte & Herbert, 2008; Veletsianos & Miller, 2008; Wang et al., 2008). Animated pedagogical agents are digital lifelike autonomous characters which cohabit learning environments with students to create rich face-to-face learning interactions (Johnson et al., 2000; Veletsianos & Miller, 2008). Efficient pedagogical agents should exhibit emotions to a wide range of applications for virtual human characters and match speech–gesture combinations (Buisine & Marti, 2007; Visschedijk et al., 2013).

Animated pedagogical agents play instructional and powerful roles in a wide variety of professional and educational settings (Marakas, Johnson, & Palmer, 2000; Nakanishi, 2004; Wang et al., 2008). They, as embodied tutors, help involve the students by providing messages to them via synthesised speech via a media panel that displays images relevant to the lectures (D’Melloa, Olney, Williams, & Hays, 2012). They provide guidance to the learner (Mayer, Johnson, Shaw, & Sandhu, 2006). The animated pedagogical agents promote learners’ self-confidence and induce the learner’s sense of autonomy and approval (Wang et al., 2008). In addition, embodied conversational agents in pedagogical-like applications can increase the perceived ease and entertainment in memorisation compared with equivalent systems with no agent (Beun et al., 2003, and Moreno et al., 2001, as cited in Buisine & Marti, 2007).

Animated pedagogical agents act like mediators between the users and the application. They can behave somewhat like a teacher in the classroom, supporting and illustrating their

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movement characteristics, particularly in terms of facial expressions, voice, hand gestures and dialogue and conversational characteristics, among other factors (Buisine & Marti, 2007; Gulz & Haake, 2006; Prendinger, Mori, & Ishizuka, 2005). Two other terms related to animated pedagogical agents, as they are used in the educational context, are cyber assistant professor (CAP) and cyber theatre (CT). According to Matsuda and Shindo (2006), a CAP is designed as a self-learning system which allows interactive communication between the virtual teacher and the learner. Meanwhile, a CT is designed as a three-dimensional story maker, which is a new three-dimensional media player attractive enough to arouse the interest of students. Both CAP and CT play interactive three-dimensional computer graphics (CG) animations while the teacher's voice is speaking and sound effects and background music are playing; they are independent application software installed on each learner's personal computer (Matsuda & Shindo, 2006).

#### *3.3.4.2 Embodied conversational agents (ECAs)*

Embodied conversational agents are a type of interface characters (van Vugt, Hoorn, Konijn, & Dimitriadou, 2006). They are considered one future possibility for overcoming the problems associated with human–technology interactions (Cassell & Bickmore, 2000; Kramer et al., 2013). They help users find useful information about a topic on a website (Eisman, López, & Castro, 2012). They are virtual characters for humans who specifically focus on dialog-based interactions (Lisetti, Rezaamini, Yasavur, & Rishe, 2013; Sajó, Ruttkay, & Fazekas, 2011). They are also known as intelligent virtual agents (IVAs) (Lisetti et al., 2013), human-like characters (Noot & Ruttkay, 2005; Sajó et al., 2011), or life-like characters (van der Sluisa, Luz, Breitfuß, Ishizuka, & Prendinger, 2012). ECAs are defined as living creatures in looks and behaviours which remain on the computer screen to assist the users with the task at hand (Cassell et al., 2000). They are ‘virtual entities with graphical representations that often possess a humanoid 3-D virtual embodiment and are capable of varying the degrees of behavioural autonomy’ (Castellano, Mancini, Peters, & McOwan,



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2012, p. 777). ECAs are digital systems created with an anthropomorphic embodiment (screen-based anthropomorphic entities) and are capable of having a conversation with a human counterpart using some artificial intelligence broadly referred to as an agent (Beale & Creed, 2009; Lisetti et al., 2013).

ECAs are anthropomorphic entities (Rehm, 2008) which primarily use artificial appearances (Lopez-Colinon & José Colás, 2012). Many conversational agents, in computer graphics and animation, have been developed with a wide range of human-like behaviours or human-like characteristics (Brahnam & De Angeli, 2012). ECAs mimic human communicative behaviours in a number of social settings (van der Sluisa et al., 2012). The embodied conversational agents can provide appropriate verbal and nonverbal behaviours (van der Sluisa et al., 2012). They can communicate with individuals in a natural way of communicating/natural language through voice-based conversation, speech through appropriate gestures, facial expressions and postures (Brahnam & De Angeli, 2012; Cassell & Bickmore, 2000; Castellano et al., 2012; Eisman et al., 2012; Niewiadomski & Pelachaud, 2010; Noot & Ruttkay, 2005). ECAs offer great promise for more natural interactions in social settings (Rehm, 2008). The believability of ECAs depends highly on their nonverbal communicational skills (Noot & Ruttkay, 2005). These virtual assistants are real-time intelligent systems because users do not want to wait to get the information they need (Eisman et al., 2012).

ECAs can be described as two- or three-dimensional graphical model or entities residing on the screen and endowed with multiple modes, using various forms of verbal and nonverbal signals, as communication characteristics of real people (Eisman et al., 2012; Niewiadomski & Pelachaud, 2010; Sajó et al., 2011). ECA landscapes include a full body agent which permits for behaviour control, realistic facial expressions and gesture animation (Rehm, 2008). They are semi-autonomous agents that enable users to control the content of what avatars say and their movements, such as walking; however, automated nonverbal

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conversational cues displayed by the avatars are generated based on the conversational context (Cassell & Bickmore, 2000). Embodied agents have ‘emotional engines’ that help drive their behaviour and actions (Beale & Creed, 2009). Embodied conversational agents are characterised as a conversational interface such as Rea, a synthetic real-estate agent (Cassell, 2000; Cassell et al., 2000), and Greta (de Rosis, Pelachaud, Poggi, Carofiglia, & Carolis, 2003). They can carry out some human abilities, such generating, recognising and responding to verbal and nonverbal cues, dealing with conversational functions, and giving signals that indicate the state of the conversation (Cassell, 2000; Gerhard et al., 2004). They can use conversational storytelling as small talk to share stories of past problem-solving behaviours and find information about the user in order to help achieve task goals (Cassell, 2000). In addition, they can move between a purely virtual and a mixed reality environment (Dorfmueller-Ulhaas & Andre, 2005, as cited in Holz et al., 2011). The COGITO agent mimics humans in terms of their visual appearance, facial gestures and conversational interactions with their users (Hertzum, Andersen, Andersen, & Hansen, 2002).

Today, ECAs are increasingly being applied to many different fields, such as entertainment, tourism, e-learning, e-commerce and medicine in the application domain (Eisman et al., 2012). ECAs are more commonly being used in different areas, such as product presentation and sale, training, education, entertainment and games (van der Sluis et al., 2012). As the embodied conversational agent is not another human, interaction can only look like human interactions, but will never be precisely the same (Rehm, 2008). They have also been used in e-commerce, such as Ana, the shopping assistant at Ikea, to attract consumers (Brahnam & De Angeli, 2012). Issues that should be considered when designing ECAs are conversational skills, anthropomorphic features, environmental awareness, subject knowledge, and the mobility and movement (Gerhard et al., 2004).

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#### 3.3.4.3 *Interactive animated characters*

Recently, more attention has been focused on using interactive characters in computer interfaces (Isbister & Nass, 2000). This term refers to avatars on retail websites, particularly in the marketing and human–computer interaction literature (Keeling et al., 2010; Poncin & Garnier, 2012), and sometimes denotes synthetic persona, offering information to the users and representing the personalisation of the system through their appearance to those users (Witkowski, Neville, & Pitt, 2003). Avatar animated characters are defined as the graphical representation of individuals (Davis et al., 2009, as cited in Saunders et al., 2011). Through these animated characters, real interactions are simulated (Halvorson et al., 2011; Witkowski et al., 2003). They generate speech and gestures and gaze direction or text-to-speech engines (Breazeal, 2003; Prendinger & Ishizuka, 2001; Wang et al., 2008). In other words, the interactive characters have verbal (text) and nonverbal personality cues (posture) (Isbister & Nass, 2000, as cited in Lee, 2008). The interactive animated characters (socially intelligent agents) can engage in social interactions by expressing emotions as well as affective behaviours (Prendinger & Ishizuka, 2001).

Interactive characters will soon play helpful roles, such as enabling consumer website visitors to do things and making it easy for them to interact through natural forms of conversation and relationships built based on familiarity, affection, and trust (Hayes-Roth, Johnson, van Gent, & Nescourt, 1999). The animated character agents deliver the information about the products on the websites, just like a sales assistant in a real store (Witkowski et al., 2003). Interactive characters are a tool for developing two-way learning relationships between enterprises and consumers and a means to engage consumers in rich conversational interactions (Hayes-Roth et al., 1999).

#### 3.3.4.4 *Virtual characters vs. robots*

Virtual characters are artificial entities which appear in various contexts, such as webpages, where they inform visitors about the website (Hoffmann & Krämer, 2013). Virtual

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characters are not seen as embodied at all, due to their non-physical embodiment, as in robots (Hoffmann & Krämer, 2013). Robots have a three-dimensional physical body while virtual characters, such as on-screen agents (Shinozawa, Naya, Yamato, & Kogure, 2005) or avatars (Holzwarth et al., 2006), have a two-dimensional one (Shinozawa et al., 2005) or a three-dimensional object (Cheok et al., 2011). Appearance and voice are important for both robots and on-screen agents as humans tend to recognise social roles, gender, or character through an analogy with appearance (Shinozawa et al., 2005). Virtual characters seem to be more competent for conversational purposes (Hoffmann & Krämer, 2013). They can introduce socio-emotional expressions, such as criticality, encouragement and praise (Gulz, 2005, as cited in Slotte & Herbert, 2008). Its animations are made by using a highly accurate representation of the movements, including hands, arms and facial expressions (López-Ludeña, San-Segundo, González Morcillo, López, & Muñoz, 2013) or gestures and postures that might make the digital systems more engaging (Ibáñez, 2013).

#### *3.3.4.5 Virtual agents*

Virtual agents are animated embodiments seen on the screen that feature a human-like appearance and present various human-like behaviours, such as speech, emotions, gestures, and eye, head, and body movements (Chattaraman, Kwon, Gilbert, & Shim, 2011). The virtual agents aim to help users who navigate the site and assist them in finding products of interest, searching for specific products, browsing special offers, handling orders and payments, and getting help (Hertzum et al., 2002). The human-like virtual agents substitute for social reactions by providing their anthropomorphic appearance and functionality (Kramer, Kopp, Becker-Asano, & Sommer, 2013; Lee, 2008). They can be characterised by six features: agent modality (text based versus voice based versus multimodal such as speech, text, facial expressions and body language), agent interaction (task oriented versus social), agent animation, agent realism (human versus humanoid versus abstract), agent embodiment (full body versus face) and agent gender (Chattaraman et al., 2011). Virtual

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agents can take the form of presentation agents that gather relevant information from various web sources, pedagogical assistants, recommendation agents and consumer service representatives that help companies provide a consistent and enhanced consumer experience associated with the brand (Chattaraman et al., 2011; Köhler, Rohm, de Ruyter, & Wetzels, 2011). To consider the virtual agent as a helper, they must have two main features: autonomy and intelligence (Ben Mimounn, Poncin, & Garnier, 2012). Embodied virtual agents (EVAs), online virtual agents or virtual salespersons or advisors have been widely covered in marketing (Garnier & Poncin, 2013; Köhler et al., 2011). They are a particular type of avatar whose ‘puppeteer’ is the computer (Garnier & Poncin, 2013).

#### *3.3.4.6 Synthetic characters*

Synthetic characters can generate behaviours such as communicating with high-level dialogue, using natural cues, expressing and/or perceiving emotions of other characters, exhibiting distinctive personality and character and learning/developing social competencies (Fong et al., 2003, as cited in Looijea, Neerinx, & Cnossen, 2010). Emotions play a central role in synthetic agents (McQuiggan & Lester, 2007). The synthetic persona, as an electronic personal sales agent, can play three primary roles, including a product advisor, who provides help and assists users whilst using the system and provides small amounts of ‘continuity’ information about the progress of the session (Witkowski et al., 2003).

#### *3.3.4.7 Animated interface agents*

Interface agents are a kind of technology which has become widely used to assist users (Silvia & Amandi, 2004). Interface agents help consumers by performing two tasks: knowledge base query (query processing) and information presentation (Ba, Kalakota, & Whinston, 1997). Interface agents are computer programmes that aid a user in achieving tasks carried out on the computer, such as sorting email and scheduling meetings (Dehn &

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Vanmulken, 2000). In other words, they are computer programmes which deliver personalised assistance to users for their computer-based tasks (Silvia & Amandi, 2004). Such personalisation helps ensure a good relationship with users by considering each user's interaction preferences and assistance requirements (Gong, 2007; Silvia & Amandi, 2004). Interface agents, as computer-based characters, are major means of emotional expression on computers (Gong, 2007). Life-like animated interface agents have attracted significant interest and attention in recent years (Prendinger, Ma, & Ishizuka, 2007). In order to motivate users, the interface agents are offered in the form of animated graphical images (Serenko, 2006) in order to endow them with subtle expressivity by means of linguistic style, such as polite speech and conversational gestures (Prendinger et al., 2007; Prendinger et al., 2005). These animated interface agents provide help to users and present the products (Prendinger et al., 2007). They are a reactive, collaborative, and autonomous visual computational system that communicates directly with users, offering assistance and advice when performing computer-related tasks (Serenko, 2006).

#### *3.3.4.8 Software agents:*

In the 21<sup>st</sup> century, there is an urgent need to deal with information through innovative management to support organisations as such information should come alive, not just online, and be managed as active (Khoong, 1995). Software agents are a key technology in overcoming both business and consumer challenges in e-commerce (Maes, 1999). In other words, the electronic market is characterised by the infrastructure functions it provides. These functions can be thought of as being performed by software or human agents on behalf of the consumers or providers (Bhargav, Krishnan, & Miiller, 1997). The software agent technology appears to be an attractive paradigm for supporting e-commerce applications; it has indicated the opportunity of new business models, ranging from e-shops and e-auctions to virtual enterprises and e-marketplaces (Orradi, Remonini, Ontanar, & Tefanelli, 1999). The use of software agent technology supports the construction of e-retail

based in and connected to local communities (Witkowski et al., 2003) and facilitates online trading in the e-commerce environment (Huang, Lin, & Yuan, 2006), potentially by making optimal purchasing decisions (Sproule & Archer, 2000) and improving the quality of services comprising the e-commerce portal. The goal is to provide the intelligent management generated by the software agents and improve key aspects in the retail e-commerce environment (Castro-Sanchez, Miguel, Vallejo, & Herrera, 2010; Witkowski et al., 2003). Table 3.6 shows some definitions of software agents as indicated in the selected articles.

Definitions of software agents	Source
A computer program but the term 'agent' and its classification have different meanings depending on what is central to the agent system(s).	Franklin & Graesser 1996 cited in Dong & Srinivasan, 2013)
A special computer program that is designed with special function(s) to execute predefined task(s) for its owner.	(Dong & Srinivasan, 2013)
Pieces of software that profile a user or buyer	(Maes, 1999)
A computer program that can operate autonomously and accomplish unique tasks without direct human supervision.	(Liang & Huang, 2000)
Computer programs that run in the background and perform tasks autonomously as delegated by the user.	(Sproule & Archer, 2000)
A program that can operate autonomously and accomplish unique tasks without direct human supervision similar to human counterparts.	(Yen et al., 2000)
An agent is an encapsulated computer system that is situated in some environment and that is capable of flexible, autonomous action in that environment in order to meet its design objectives.	[24] cited in (Vahidov & Kersten, 2004)
A (computer) system that is situated in some environment and that is capable of autonomous action in this environment in order to meet its design objectives.	[18] cited in (Bryll, Rose, & Quek, 2005)
A computer program that is situated in some environment and is capable of autonomous action in this environment in order to meet its design objectives.	[51] cited in (Wang et al., 2009)

**Table 3. 6 Different definitions of software agents**

Software agents can play several roles, such as serving the consumer's interests as well as receiving personalised service, helping people identify their needs by keeping track of each user's interests and notifying a user when a new product matches his or her profile (Maes, 1999). Software agents help consumers choose between merchants by contacting a number

of websites and comparing prices and other conditions on these sites (Maes, 1999). Thus, retailers can develop personalised relationships with their consumers and offer higher-quality service (Maes, 1999). The agents are responsible for monitoring both the environment and the user, generating proposals as the data changes, and learning users' preferences (Vahidov & Fazlollahi, 2004), gathering information (Lee & Chung, 2005) and solving problems (Kang & Han, 2002). The main functions of software agents are to support collaboration, support decision-making processes and deliver services (Dong & Srinivasan, 2013). In addition, they keep a detailed profile of demographic information (e.g., zip code, age, and gender of the user or consumer) and track interests and preferences of consumers (Maes, 1999). Software agents can play important roles, such as reducing information overload, managing information, supporting decision-making, and automating repetitive office and personal activities on behalf of the user (Crowder, Robinson, Hughes, & Sim, 2012; Liang & Huang, 2000). Table 3.7 displays the main characteristics of the software agents, as indicated in previous studies.

Main characteristics	Source
Autonomy, pro-activeness and intelligence	(Karacapilidis & Moraitis, 2001).
Autonomy, social ability, reactivity, and pro-activeness	(Liang & Huang, 2000).
Personalised, autonomous, adaptive and proactive, interactivity and expressiveness	(Papadopoulou et al., 2001)
Autonomy, reactivity and proactivity.	(Paurobally et al., 2003)
An atomic software entity operating through autonomous actions	(Nassiri-Mofakhama et al., 2009)
Have personality and react differently in different situations.	(Eisman et al., (2009)
Autonomy, interactivity, reactivity and, proactiveness.	Wang et al., (2009)
Autonomously and proactively, sometimes outside the user's awareness.	Persson et al., (2001)
Entirely virtual.	Bryll et al., (2005)
Autonomy, reactivity, social ability, and proactiveness.	Vahidov & Fazlollahi, (2004)



Autonomous, proactive, adaptive, continuous fashion and communicative	(Green et al., 1997 cited in Papadopoulou et al., 2001)
Autonomy and interactivity	(Lee, 2008)
Autonomy, social ability, reactivity and pro-activity.	(Wang & Wang, 2006)
Intelligence, social ability, warmth, responsiveness.	(Cowell & Stanney, 2005)
Autonomous objects	(Zhu et al., 2006)
Visible and animated, static, and invisible	(Sanchez & Garcia-Rodicio, 2008)

**Table 3. 7 Main Characteristics of software agent**

Software agents are used as component services and decision support systems by decision makers (Dong & Srinivasan, 2013). They support intellectual work and group collaboration (Yen, AËberg, & Shahmehri, 2000). They also help grow sales and link business goals with consumer interests, which can fulfil business goals of web commerce, such as consumer loyalty (Maes, 1999). Software agents are seen as a ‘renaissance’ for artificial intelligence and ‘helpers’ for users (Sproule & Archer, 2000). Software agents can reduce the effort required to complete an e-commerce transaction; they are adaptive and capable of learning from both past actions and their environment (Orradi et al., 1999). They offer services such as searching, comparing, learning, negotiating and collaborating (Papadopoulou et al., 2001). A hybrid avatar/agent can represent the user (Gerhard et al., 2004).

#### 3.3.4.9 Intelligent agents (IA):

An intelligent agent is a software programme (Leung, Cheung, & Hui, 2000) which is rapidly becoming a hot topic in research, particularly in IT systems (Khoong, 1995; Liang & Huang, 2002; Xu & Wang, 2006; Ye, 2001). Intelligent agents are an example of machine-centric technologies (Carayannis, 1999). Previous research revealed a strong interest in intelligent agents for e-commerce (Lee, 2000). Different terms in the literature have the same meaning as intelligent agents and are used interchangeably, such as autonomous agents (Bhargav & Branley, 1995), ‘bots’ (Berthon & Katsikeas, 1998), software agents or brokers (Ba et al., 1997), agent-based systems, virtual agents (Lau, Tso, & Ho, 1998) and holons (Heragu, Graves, Byung-In Kim, & St. Onge, 2002). Nine Lives Clothing Store first

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used this technology on its website commercially in late 1994 (O'Connor & O'Keefe, 1997). No universally recognised definition exists for intelligent agents (Xu & Wang, 2006). Intelligent agents are defined as software components and/or hardware able to act exactly to accomplish tasks on behalf of users and learn as they react and/or interact with their external environment (Nwana, 1996, as cited in Liang & Huang, 2002). They can be also defined as 'human-like computer programs which can help in a variety of tasks, such using, maintaining and optimising computer, navigating through a complex online file structure, and advising players, etc.' (Berthon & Katsikeas, 1998, p. 152), 'a program that embeds knowledge and drives its actions' (Ba et al., 1997, p. 179) or 'computer representations of real-world entities (e.g., humans) that can govern their own behaviour' (Bhargav & Branley, 1995, p. 329). Intelligent agent technologies aim to facilitate the interaction between users and systems (Xu & Wang, 2006) or provide ubiquitous computing intelligence in the environment, supporting the activities of the user (Remagnino, 2005). They are able to facilitate workflows within the virtual enterprise (Lau, Wong, Ngai & Hui, 2003). An avatar can function as an intelligent agent, perceiving and responding within the environment, giving, receiving and filtering information in order to fulfil a predefined task (Gerhard et al., 2004). Adding personality and behaviours to the intelligent agents makes them more human-like and realistic (Nassiri-Mofakhama, Nematbakhsh, Ghasem-Aghae, & Baraani-Dastjerdi, 2009).

Intelligent agents have been extensively used to support decision making (Liang & Huang, 2000) and achieve the optimum action for solving problems effectively by searching information, copying related information, modelling and analysing (Lee & Chung, 2005, as cited in Heragu et al., 2002). Intelligent decision-making agents can achieve personalisation by recognising individual actions and reacting correspondingly (Xu & Wang, 2006). In addition, intelligent agents are designed to improve the existing process of product development (Huang, 2001). They can improve the way information is gathered, managed,

distributed and utilised by decision-makers in key business functions and operations (Liang & Huang, 2002). Intelligent agents help create longer-term and mutually beneficial relationships (Varadarajan & Yadav, 2009). They can assist buyers in restructuring operations by eliminating redundant or irrelevant information and identifying patterns that suggest the use of a particular choice strategy (Sproule & Archer, 2000). Intelligent agent technologies enables commercial users to evaluate buyers and customise products and prices in real time (Aron, Sundararajan, & Viswanathan, 2006). The anthropomorphic design of intelligent agents has appeared to be a productive venue (Marakas et al., 2000). Virtual settings inhabited by socially intelligent agents or avatars exhibit meaningful gestures to ensure that a direct dialog between consumers and distributed manufacturing system could be achieved by using intelligent agent technology (Persson, Laaksolahti, & Lönnqvist, 2001). Intelligent shopping agents are likely to play a major role in the design of new marketing strategies (Hostler, Yoon, Guo, Guimaraes, & Forgionne, 2011). Table 3.8 shows a number of the main characteristics of intelligent agents.

Main characteristics of intelligent agents	Source
Must receive their inputs through other computer programs or external sources. Have representation and reasoning capabilities. Human-like intelligence.	Bhargava & Branley, 1995
Intermediary and autonomy	Lee & Siegel, (1996)
Intelligence, autonomous, cooperation	(Liang & Huang, 2002)
Are search engines that facilitate resource finding. Automated.	Wurman et al, 1998
Cooperative, autonomy, and learning	(Etzioni & Weld, 1995 cited in Liang & Huang, 2002)
Autonomy, proactiveness, reactivity, reasoning capability, social ability and incorporation of human-like features, e.g., beliefs, desires, intentions, commitments, motivations, etc.	Vahidov & Fazlollahi, (2004)
Contain the supporting information that may include the type of data and the languages that the agent understands.	Ba, et al., (1997)
Social entities.	Prendinger & Ishizuka, (2001)
Responsive to the user commands. In control	(Doctor & Hagra, 2005)
Autonomy and intelligent	Dehn & Vanmulken, (2000)

**Table 3. 8 Main characteristics of intelligent agents**

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#### 3.3.4.10 Mobile Agent (MA):

Mobile agents are a type of software agents (Dong & Srinivasan, 2013). The mobile agent paradigm is a new approach for designing applications (Orradi et al., 1999) to help decision makers solve control and routing problems (e.g., time delays, data losses, broken links) in real time (Dong & Srinivasan, 2013; Hsu & Liu, 2007; Sim & Sun, 2003). Mobile agents offer a flexible tool for distributing data around a network and carrying multiple threads of execution, decentralised scheduling and communication with other agents (Chakravarti, Baumgartner, & Lauria, 2005). The majority of the mobile agent systems are Java-based (Chakravarti et al., 2005). The virtual operator is a mobile agent that communicates with a recommendation agent on the same host (computer system) (Hsu & Liu, 2007). Mobile agent technology can support e-commerce transactions and help with information gathering, exchanging information filtering and negotiation (Acampora & Loia, 2011; Orradi et al., 1999). The mobile agent can use short linguistic descriptions over a stationary and more verbose agent (van der Sluisa et al., 2012).

#### 3.3.4.11 Recommendation agents (RAs)

Recommendation agents (RAs) are a kind of browsing agent (Yen et al., 2000). Commercial RAs are a primary source of product information and product users (Aljukhadar & Senecal, 2011). They are ‘software agents that elicit the interests or preferences of individual users for products, either explicitly or implicitly, and make recommendations accordingly’ (Xiao & Benbasat, 2007, p. 138). A number of terms are used interchangeably with recommendation agents, such as recommender systems, recommendation systems, shopping agents, shopping bots, shopbot, and comparison-shopping agents (Garfinkel, Gopal, Pathak, & Yin, 2008; Punj, 2012; Punj & Moore, 2009; Xiao & Benbasat, 2007). RA systems can be considered product quality information built on shoppers’ previous purchasing/browsing behaviour (Garfinkel et al., 2008).

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In online shopping environments, recommendation agents or software-based product recommendation agents (PRAs), such as computer agents, can serve as virtual salespersons who advise consumers or carry out the product-advising function on what to buy, just as human salespersons do in physical stores (Komiak & Benbasat, 2004; Komiak, Wang, & Benbasat, 2005; Qiu & Benbasat, 2009). RAs are an effective tool for B2C e-commerce as they reduce the extent of product searches via quick access to relevant information and provide more effective promotion of selected products (Hostler et al., 2011). In other words, RAs are personalised, advice-giving technology in the electronic commerce which possess a certain amount of product information to support consumers in configuring their needs and interests for better decision-making/decision quality as they can reduce the information overload facing consumers as well as the difficulty inherent in online searches (Komiak & Benbasat, 2004; Maes, 1999; Punj, 2012; Xiao & Benbasat, 2007). RAs and PRAs are decision support/aid tools (Dong & Srinivasan, 2013; Tversky, 1988, as cited in Aljukhadar & Senecal, 2011; Yoon et al., 2013).

Comparison shopping websites using RAs or virtual salespersons are becoming increasingly prevalent among websites and internet businesses, such as Amazon and eBay (Hostler et al., 2011; Komiak et al., 2005; Li, Wu, & Lai, 2013; Qiu & Benbasat, 2009; Yoon et al., 2013). RAs' roles in online stores are similar to those of real salespersons in physical stores (Komiak et al., 2005). They facilitate the consumers' purchase process (Punj & Moore, 2009), enable consumers to quickly navigate through huge product assortments to find that elusive bargain (Punj, 2012), discover new products and gather more information on previously known choice options (Maes, 1999; Punj, 2012) and provide a customised online shopping experience (Hostler et al., 2011). In addition, they assist users in making choices from among various alternatives (Li et al., 2013), identify the users' backgrounds and even greet users (Aljukhadar & Senecal, 2011) and help users identify the items that suit their needs or preferences in an effective way (Li et al., 2013). RAs' design consists of three

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major components: input where user preferences are elicited, explicitly or implicitly; the process whereby recommendations are generated; and output where recommendations are presented to the user (Xiao & Benbasat, 2007). RAs' systems are human-like due to their ability to execute autonomous actions (Aljukhadar & Senecal, 2011).

In online shopping environments, the product-advising function captured by the software-based PRAs with a voice/speech interface is implemented either with computer-synthesised voice or pre-recorded human speech (Qiu & Benbasat, 2009). In the context of e-commerce, PRAs provide online shoppers with virtual advising services by gathering, screening, and evaluating the vast amount of product information available on the web (Qiu & Benbasat, 2010). There are two major categories of PRAs. Collaborative-filtering PRAs can predict a consumer's preferences based on user-generated content such as ratings on items (e.g., movies, music, books) and are mostly implemented by online retailers such as Amazon.com (Qiu & Benbasat, 2010; Yoon et al., 2013). In contrast, content-filtering PRAs generate recommendations based on consumers' explicit preferences for particular product attributes and are usually designed and implemented by comparison shopping websites (Qiu & Benbasat, 2010). A straightforward way of manipulating nonverbal cues is to equip the PRA with an anthropomorphic interface — namely, adding human-like characteristics, such as facial expressions, body gestures, or speech output to the agent (Qiu & Benbasat, 2009 & 2010).

#### *3.3.4.12 Autonomous agents*

Autonomous agents have become important (Vahidov, 2005) anthropomorphising nonhuman entities (Epley & Waytz, 2009, as cited in Puzakova, Kwak, & Rocereto, 2013). Mobile intelligent software agents are software autonomous agents (Nassiri-Mofakhama et al., 2009). The user- or computer-controlled autonomous agents can control the avatar (Lee

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& Chung, 2005). Semi-autonomous avatars are agents/avatars with their own behaviours and intentionality (Paiva, Machado, & Prada, 2001).

### ***3.3.5 Main similarities and differences between concepts***

Based on the comprehensive discussion about the different terms used in the literature, the majority of them are significantly related to avatars. A number of scholars have used these terms interchangeably. However, it is valuable to identify the significant relationships (indicating some similar and dissimilar points) between these terms and avatars. First, animated pedagogical agents (APAs) are an example of avatars in multi-user virtual environments, but APAs focus on supporting learning and teaching in the virtual or natural e-learning platforms or environments. Second, avatars are a part of embodied conversational agents (ECAs) as they are semi-autonomous agents whose speech content and movements are controlled by humans while the automated nonverbal conversational signs displayed by the avatars are generated based on the conversational context (Cassell & Bickmore, 2000). Third, interactive animated characters refer to avatars on retail websites, particularly in the marketing field (Keeling et al., 2010; Poncin & Garnier, 2012). Fourth, virtual characters are artificial entities which appear on webpages, where they inform visitors about the website (Hoffmann & Krämer, 2013) such as on-screen agents (Shinozawa et al., 2005) or avatars (Holzwarth et al., 2006). Fifth, virtual agents or online virtual agents and/or virtual salespersons or advisors are a particular type of avatar whose ‘puppeteer’ is the computer (Garnier & Poncin, 2013) and who feature a human-like appearance via their various human-like behaviours, such as speech, emotions, gestures, and eye, head, and body movements (Chattaraman et al., 2011). Sixth, synthetic characters communicate with a high level of dialogue, such as an electronic personal sales agent, which can play three primary roles: acting as a product advisor, providing help and assisting users (Witkowski et al., 2003). It seems to look like or be related to ECAs. Seventh, the interface agents are sometimes offered in the form of animated graphical images (Serenko, 2006) to provide a

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means of linguistic style such as polite speech and conversational gestures. These features are also used in avatars, but they are a reactive, collaborative, and autonomous visual computational system offering assistance and advice in performing computer-related tasks as avatars are often not automated. Eighth, software agents, as a system, are different terminology from avatars but can be linked with avatars, which represent the users or consumers. Ninth, in terms of intelligent agents, the avatar can function as an intelligent agent, perceiving and responding within the environment as well as giving, receiving and filtering information in order to fulfil a predefined task (Gerhard et al., 2004). Socially intelligent agents are avatars which exhibit meaningful gestures (Persson et al., 2001). Tenth, recommendation agents are different in terms of terminology from avatars, like software agents. However, avatars can be added to the RAs by providing human-like characteristics, such as facial expressions, body gestures, or speech output to the agent (Qiu & Benbasat, 2009; Qiu & Benbasat, 2010). Eleventh, mobile agents—a different term from avatars—can use short linguistic descriptions (van der Sluisa et al., 2012), like avatars. Finally, autonomous agents are a main feature of mobile agents and software agents. User- or computer-controlled autonomous agents can control the avatar (Lee & Chung, 2005). Table 3.9 compares avatars, embodiment agents, embodiment conversational agents and embodied virtual agents based on the work of Garnier and Poncin (2013) and Nunamaker et al. (2011) and adapted by the researcher.



Interface	Avatars	Embodiment agents	ECAs*	Embodied Virtual Agents
<b>Brief description</b>	Graphic representation (character) of the user. An extension of the corresponding human	3D representation	3D representation	Graphic personification of computers or processes carried out by computers. Called an 'embodied' when its graphic representation takes a human or humanoid form.
<b>Automated control</b>	Not automated	Automated	Automated	Automated
<b>Human control</b>	Totally controlled by users. Designed by the human it represents.	Programmed	Programmed	Controlled by automatised computer processes (software, artificial intelligence). Designed and programmed by the organisation.
<b>Communication via speech</b>	Maybe	No speech	Speech	
<b>Relationship with consumer</b>	Relationship with one's self-representation.			A third party with which the consumer can interact through dialogue.
<b>Functions</b>	A mediator on the interface.			Automatically carrying out a task for, and instead of the user.
<b>Object represented</b>	A human being.			a computer driven process
<b>Consequences of the presence of the virtual character</b>	Affecting the individual him-/herself, his/her experience of visiting the site, his/her behaviours, attitudes and intentions.			Affecting the relationships of the users with the organisations.

**Table 3. 9 Comparisons between avatar and agents**

**3.4 Chapter summary**

This chapter started by defining the articles which embrace similar terminologies to the avatar concept using a systematic literature review approach (SLR) and search strategy. The research methodology and main results were also represented. A detailed analysis of the articles related to avatars was conducted, showing, describing and defining the avatar concept as well as displaying the main roles of avatars and their main characteristics. Next, a detailed analysis was provided regarding similar terms — namely, animated pedagogical agents, embodied conversational agents, interactive animated character, virtual character, virtual agents, synthetic character, animated interface agents, software agents, intelligent agents, mobile agents recommendation agents and autonomous agents. Finally, a comparison of all these terms was provided to highlight the main similarities and differences between them. The next chapter examines the relationships between avatars and other variables empirically examined in the selected studies.

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## Chapter Four: Variables linked by avatars

### 4.1 Introduction

Following the comprehensive review of the selected articles and building the theoretical foundations of the avatar concept in Chapters Two and Three, this chapter explores the relationships between avatars and other variables as identified in the extant literature. Specifically, Chapter Four maps selected studies identified in Chapter Three to highlight the variables linked with avatars. This strategy helps determine the research gap(s). In a bid to draw a map of the existing studies, this chapter is divided into two main sections: avatars and their relationships with other variables and the gaps in the literature (see Figure 4.1).

### 4.2 Avatars and its relationships with other variables

In what follows, the relationships between avatars, their dimensions, and their relationships with other variables identified in the literature are discussed (see Figure 4.2). Figure 4.2 aids the reader by illustrating the interlinkages among the variables. The rationale for the interlinkages and the identification of variables are provided in the sections that follow.

#### *4.2.1 Relationships between avatars' features and other variables*

In this subsection, seven main features of avatars are explained, demonstrating their influence on the specific constructs: avatar types, avatar anthropomorphism, avatar appearance, gestures, facial expressions, avatar affordance, and avatar personality (see Figure 4.2).

**Avatar types.** Using a specific avatar type differed based upon the users' objectives, characteristics and communication media (Kang, 2006). Previous studies have indicated that the influence of avatars differed according to each type of avatar (Holzwarth et al., 2006; Neviarouskay et al., 2010). For instance, avatar types (attractive avatar versus expert avatar) improved consumers' persuasion towards products in different ways (Holzwarth et al., 2006).

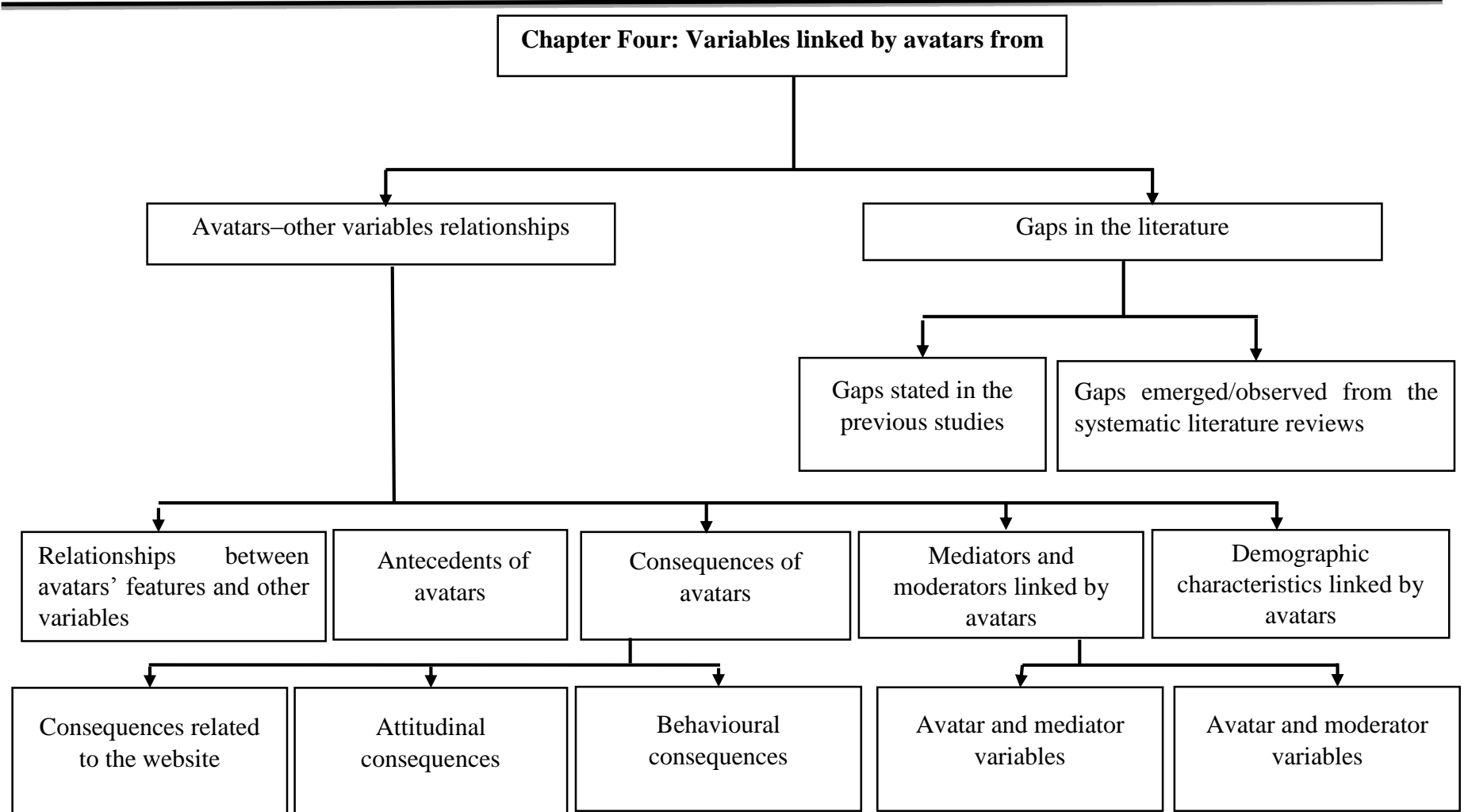


Figure 4. 1 Chapter Four map

Users have perceived human spokes-avatars to be more attractive than non-human spokes-avatars (Jin & Bolebruch, 2009). Users satisfaction also differed based on the avatar type (Kang, 2006). Furthermore, the results showed highly significant effects for virtual agent type on the clarity of the agent's voice and exaggeration of gestures (the two-dimensional embodied agents were less exaggerated than the three-dimensional embodied agents) (McBreen & Jack, 2001).

**Anthropomorphism.** A degree of anthropomorphism could be able to reduce the limitations of the system or interface (Luo, McGoldrick, Beatty, & Keeling, 2006). Anthropomorphising an agent or avatar requires adding human-like features such as facial cues, speech output, body gestures, human emotions, and social intelligence (Qiu & Benbasat, 2009). The more cues of humanity the agent has, the more effective it is (Sanchez & Garcia-Rodicio, 2008). The empathic (well-animated) version of the avatar has been positively perceived as anthropomorphic by the users or consumers (Lisetti et al., 2013). The degree of anthropomorphism of avatar can enhance social presence, perceived enjoyment, and perceived usefulness (Qiu & Benbasat, 2010).

**Avatar appearance and affordances.** Some doubt has emerged that the appearance of the avatar or agent attracts the user's visual attention (Witkowski et al., 2003). Virtual pedagogical characters with an anthropomorphic appearance can suggest the development of the situated social interaction (Slotte & Herbert, 2008), make the discussions easy to follow (Takahashi et al., 2005) and influence the likeability and/or recall (Buisine & Marti, 2004; Stevens et al., 2013; Witkowski et al., 2003). It can also provoke a positive emotional reaction (Vasalou et al., 2008), positively influence the perception of the clarity of the agents' voice (McBreen & Jack, 2001), increase the perceived users' entertainment (Ward, 2010), ensure user involvement/engagement with the character (van Vugt et al., 2006) and influence trust development (Morrison et al., 2012). Prospective consumers or users have taken various aspects of the virtual agents' appearance into consideration when they

evaluated the trustworthiness of the information source type, thereby defining crucial roles of designers when designing virtual agents (Hertzum et al., 2002). Regarding the use of animated agents in e-retail interfaces, the three-dimensional fully embodied agents were preferred over the two-dimensional agents and three-dimensional heads (McBreen & Jack, 2001).

No significant interaction effect of designed aesthetics and designed affordances emerged on the use intentions of avatars (van Vugt et al., 2006), which contradicted later research showing that designed affordance (the aiding agent compared to the obstructing agent) significantly affected use intentions, distance and user involvement (van Vugt, Baileson, Hoorn, & Konijn, 2010). Prospective consumers also considered various aspects of the virtual agents' functionality when they evaluated the trustworthiness of the information source type; thus, crucial roles of designers were identified when designing virtual agents (Hertzum et al., 2002).

**Gestures.** Avatars' active gestures can improve interactions (López-Colinon & Colás, 2012; Sutcliffe & Alrayes, 2012) as well as users' perception of friendliness, politeness and lifelikeness (McBreen & Jack, 2001). In addition, the type of gesture had also an effect on the emotion rating, such as anger and joy emotions (Castellano et al., 2012). Finally, there was a significant effect of speech–gesture cooperation on the evaluation of expressiveness (Buisine & Marti, 2007).

**Facial expressions.** Facial expressions are one of the key features of avatars (Lee et al., 2005; Takahashi et al., 2005; Vasalou et al., 2008). Previous results have shown that the facial movements of virtual agents do elicit the very same behaviour in the real human (Kramer et al., 2013). The creative self-expression of avatars, more so than real lives, formed a central motivation for Second Life usage (Partala, 2011). In particular, this feature includes the amusement or pleasure features of avatars (Lee et al., 2005). Facial features (e.g., animations) can increase the perceived expression and emotions (Takahashi et al.,

2005), the sense of presence (Sutcliffe & Alrayes, 2012) and consumer processing of consumer reviews (Lee et al., 2013). The results have also indicated that the expressive avatar increased the users' feeling of involvement in the task compared with the non-expressive avatar (Beale & Creed, 2009). The facial and bodily nonverbal behaviours of avatars significantly enhance the trust and credibility of users (Cowell & Stanney, 2005).

**Avatars' personalities.** Avatars evaluated higher in terms of the social personality for warm, creative, talkative, original, spontaneous and artistic characteristics (Looije et al., 2010). The personalities of conversational avatars can improve source credibility in terms of expertise, trustworthiness, and attractiveness. For example, sincere/competent avatars have an increased perceived source expertise, satisfaction with the brand, trustworthiness, attitude towards the brand and the online-shopping intention; meanwhile, exciting avatars have increased perceived source attractiveness (Jin & Sung, 2009, 2010). Smiling embodiment agents were not perceived as being more trustworthy, but they were seen as being more likable than neutral demeanour ones which were perceived as the most powerful (Nunamaker et al., 2011).

#### *4.2.2 Antecedents of using avatars*

To facilitate the discussion, it is useful to examine the antecedents of avatars. By reviewing the selected articles to identify the antecedent linked to using the avatar, a number of antecedents were recognised and categorised into three groups of antecedents: the identity and congruity group, the cognitive connections and social factors group and the avatar's dimensions group (see Figure 4.3).

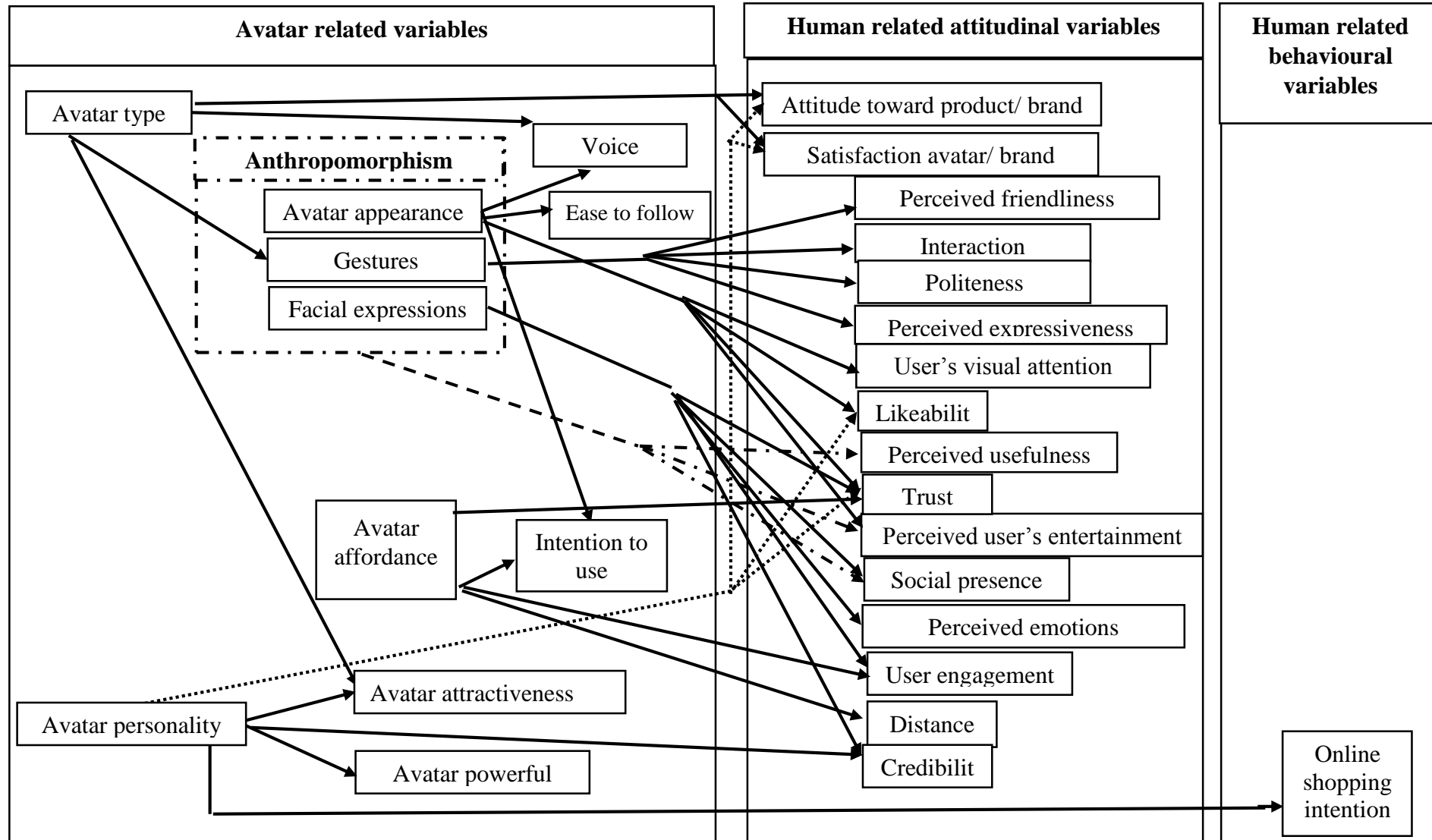


Figure 4. 2 Summary of the relationships between avatars' dimensions and other variables



**Identity and congruity.** Identity expression for social or status benefit has been developed with brands and objects (Hansen, 2009). Online identity comes from an alter ego (Rhee et al. 2010); one way of representing the identity of a user through avatars (Galanxhi & Nah, 2007; Hansen, 2009; Rhee et al., 2010). Avatars, as virtual identities, become the indicator of possible identities from the individual's imagination (Parmentier & Rolland, 2009). The use of anthropomorphic characters provides the opportunity and freedom to manipulate their identity to the users (Galanxhi & Nah, 2007). Furthermore, unlike the offline identity, which is very strong in most cases, the strength of self-awareness of one's online identity can vary from small or weak to very strong through avatars (Rhee et al., 2010). The avatar identity strengthens users' self-endorsement in virtual worlds (Ahn & Bailenson, 2011).

The concept of congruity refers to the similarity between avatars and a person's actual self (Suh et al., 2011). Through avatars, users express a self-concept (El Kamel & Rigaux-Bricmont, 2011). The results showed that an avatar represents a user's self-concept (facial and body similarity) which affect the degree of avatar identification in terms of self-congruity perspectives, thereby positively increasing the attitudes towards using avatars (Suh et al., 2011). Furthermore, when avatars look like the consumers, through the use of simple photographs, they produce a high brand attitude and purchase intention (Ahn & Bailenson, 2011). When a virtual character's personality is complementary to the user, the virtual character is perceived to be significantly more fun, more likable and useful (Isbister & Nass, 2000).

**Cognitive connections and social factors.** Cognitive connection is one of the main antecedents of using avatars. The cognitive connection with the avatars consequently becomes a strong rooting point related to reality (Poncin & Garnier, 2012), positively influencing the usefulness of an avatar and increased intention to use an avatar (Suh et al., 2011). In addition, social factors are considered one of the most influential factors in avatar usage. Along with the attitude towards avatar email and social norms, they had the most

significant effect on avatar email usage (Lee et al., 2005). They also affected virtual community members' satisfaction with the use of avatars (Kim, Baker, & Song, 2007). These social factors permit the levels of immediacy and intimacy that users feel towards avatars, real or agents, in the virtual world (Franceschi et al., 2009).

**Avatar dimensions.** The previous studies presented a number of avatar dimensions and their significant impact on avatar use. Specifically, in reviewing the selected studies, 10 characteristics were examined in different studies and have been grouped into one category in this review. These characteristics include avatars' self-efficacy, usability, accessibility, understandability, simplicity, ease of use, usefulness, cost, realism, and communication and message characteristics. Self-efficacy significantly affected avatar use as the users more favourably use avatars when they had strong confidence in their ability to use those (Lee et al., 2005). The influence of perceived efficiency considerations rather than the character's visual appearance significantly affects intentions to use avatars (van Vugt et al., 2006). In addition, the usability of avatars (e.g., the quickness to provide a recommendation set) can be considered an important antecedent for avatar use mentioned repeatedly in the results of previous research (Aljukhadar & Senecal, 2011). In terms of avatar accessibility, virtual agents must be accessible in ways that users can obtain information in order to form their trustworthiness (Hertzum et al., 2002). Furthermore, results related to avatars' simplicity showed that users preferred to react to the simple representations in avatar condition (Clayes & Anderson, 2007). Avatars' ease of use was also shown to be important; users who complete a problem-solving task experience more difficulty in communicating through an avatar system than those interacting through full video-conferencing links (Clayes & Anderson, 2007; van der Sluis et al., 2012). Moreover, designing an understandable avatar helps users develop a better understanding (Ward, 2010). The results showed that emotions represented through avatars were clear and easy to understand (Neviarouskay et al., 2010). The users found that conversation conducted through avatars was more understandable (van

der Sluisa et al., 2012). Regarding avatar usefulness, the results revealed that the video condition was rated as being far more useful than the avatar condition (Clayes & Anderson, 2007). Research about avatar cost showed that perceived cost or the additional cost to use avatars (e.g., monthly fees and avatar customisation cost) is considered one of the strongest inhibitors of avatar use (Lee et al., 2005). In terms of avatar realism, embodied conversational agents frequently represent greater realism that increases users' responses (Groom, Nass, Chen, Nielsen, & Scarborough, 2009). Finally, regarding communication and avatars' messages characteristics, avatars can improve the interpersonal communication with consumers as they are used as a rich communication medium for ascending communications much like face-to-face interactions (Lee et al., 2005; Li et al., 2011; Schwarz, Schwarz, Jung, Pérez, & Wiley-Patton, 2012) by communicating via rich emotional messages (Takahashi et al., 2005). As nonverbal communications are utilised by avatars in computer-mediated communication (CMC) environments (Morrison et al., 2012), users become more aware of nonverbal communication to manipulate their avatars (Li et al., 2011). Avatars can make gestures to convey the individual's intention to communicate as the limited gestures and difficulties in moving lead to reducing the effectiveness of avatars reflecting the limitations of communication in the technologies (Goel et al., 2011; Sutcliffe & Alrayes, 2012). Nevertheless, no evidence has indicated that avatars appear to motivate many users more effectively than simple text communication; indeed, some students felt the graphical environment was worse, which contradicts the media richness theory (Sutcliffe & Alrayes, 2012). The results also revealed that avatar users tend to prefer receiving messages in a conversational way rather than a monologue, with short messages that provide a short introduction about the conversational presentation/topic (Nishida, 2002). The results also indicated that users prefer avatars or mobile agents that use short linguistic descriptions (van der Sluisa et al., 2012) and are more informative (Jin & Bolebruch, 2009).

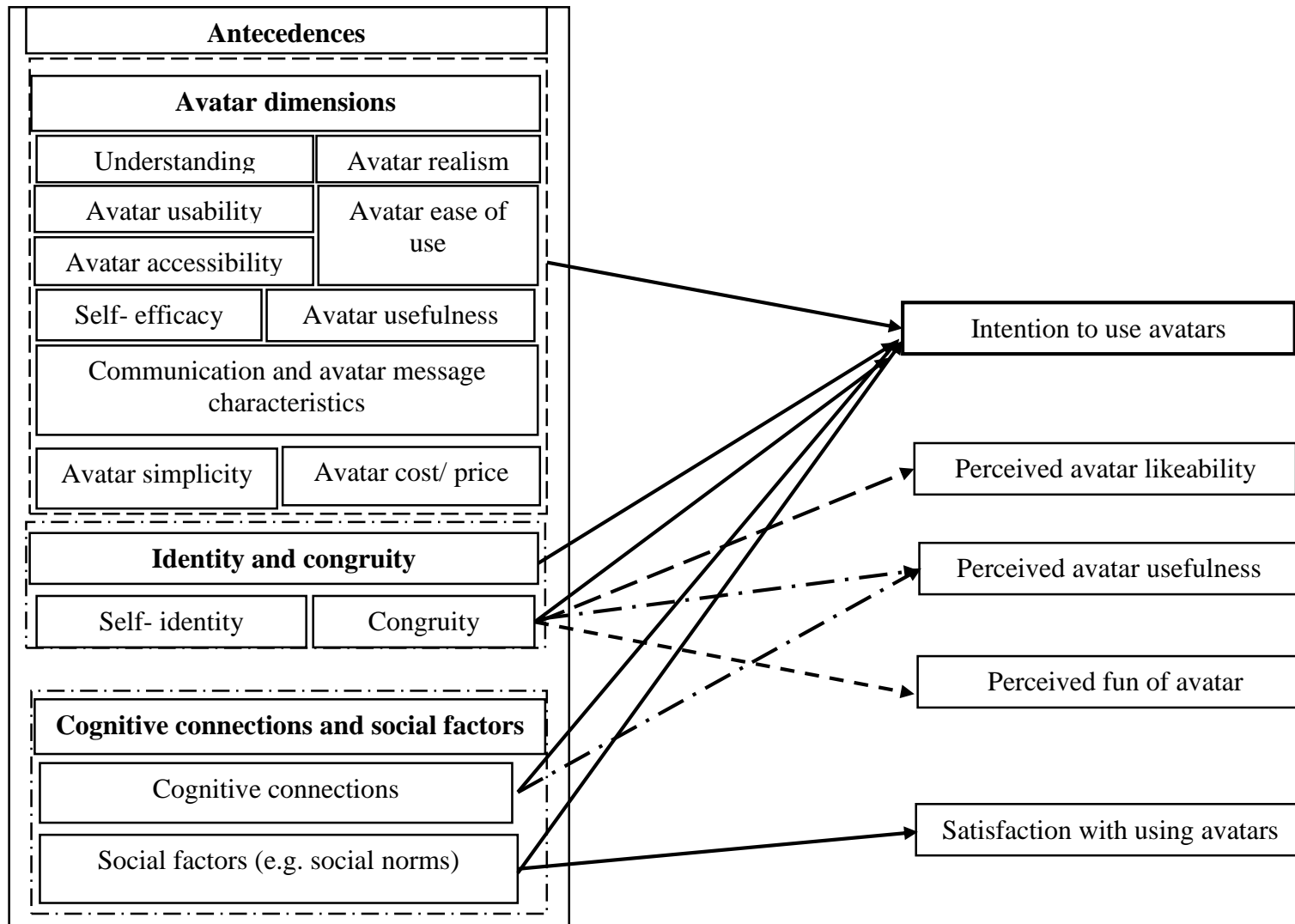


Figure 4. 3 Antecedents of using avatars

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### 4.2.3 *Consequences of avatars*

Here, consequences are divided into three main groups: consequences related to the website itself, attitudinal consequences and behavioural consequences (see Figure 4.4).

#### 4.2.3.1 *Consequences related to website itself*

The presence of avatars has considerable consequences on the websites, which have been studied in the literature (see Figure 4.4). These consequences encompass navigation, search effort, socialness, convenience, entertainment and informativeness. Avatars can support the ease of navigation (Benford et al., 2001). They can enhance the navigation experience (Aljukhadar & Senecal, 2011) as well as interact and freely navigate (Mueller et al., 2011). The results also showed that user interfaces positively differed regarding search effort when an avatar was present (Lee & Chung, 2005). However, the perceived effort (e.g., the additional time and effort needed to complete the avatar's email) was found to be a strong inhibitor to using the avatar (Lee et al., 2005). Furthermore, the presence of avatars on websites can lead to highly social websites or increase the perceived socialness of the website (Wang, Baker, Wagner, & Wakefield, 2007). The study revealed that the text-only condition or mere addition of a voice channel to the virtual agent interface is not sufficient for boosting social interactions between the users and the embodied agents due to the rich social cues embedded in the human voice (Qiu & Benbasat, 2009). In terms of convenience, the results revealed that the presence of an avatar enhanced user interfaces via the convenience variable (Lee & Chung, 2005). A website is less likely to be considered when the info desk or regular mail has been used in the past, but more likely when the virtual agent has been used; regular mail is less likely to be followed up by a virtual agent's communication functionality (Birgelen, Dellaert, & Ruyter, 2012). Finally, regarding entertainment and informativeness, avatars make websites seem more entertaining and informative (Holzwarth et al., 2006). In contrast, participants deemed avatars to be a less

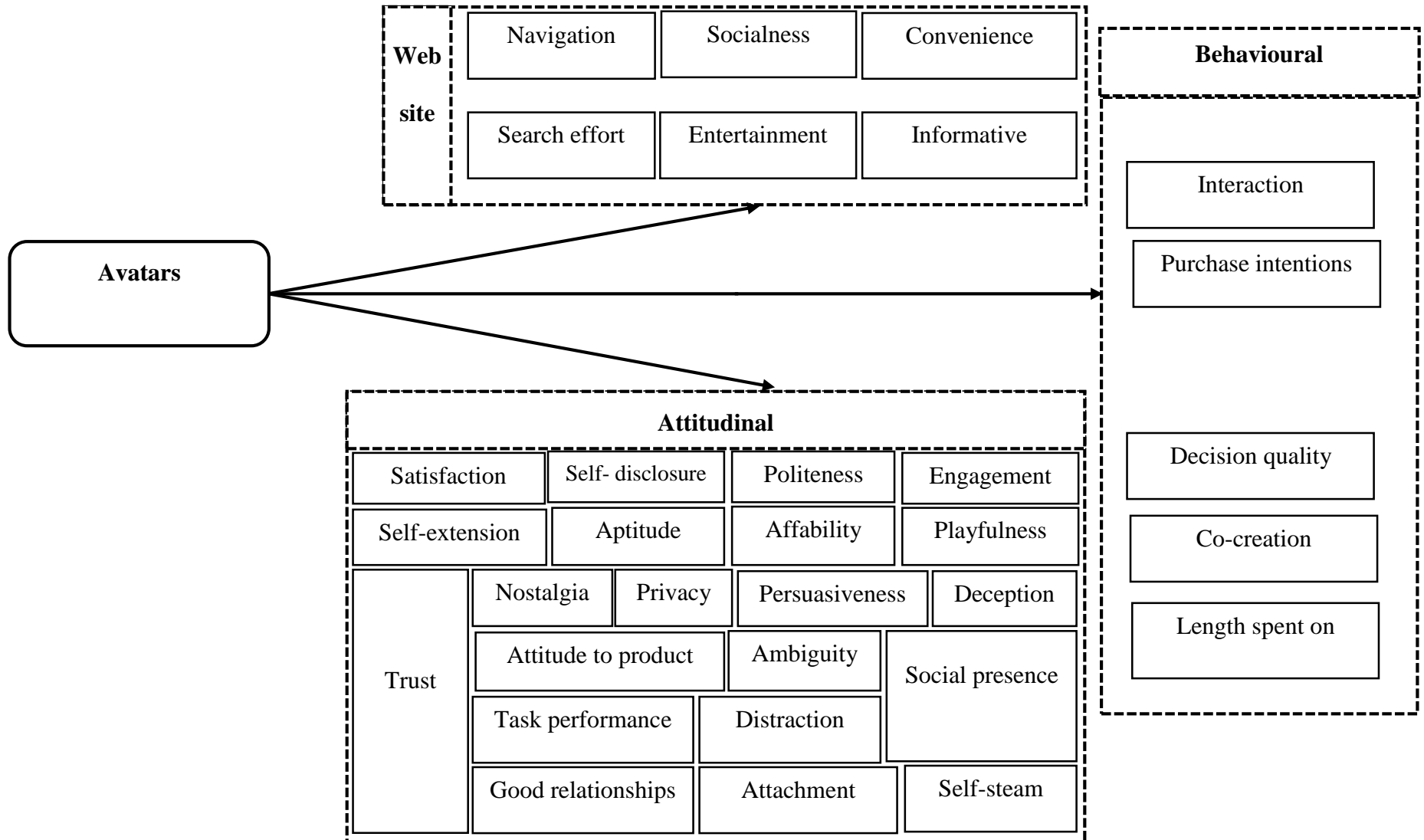


Figure 4. 4 Consequences of using avatars

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communication informative medium as there was no visual information, particularly about the nonverbal behaviours (Clayes & Anderson, 2007).

#### 4.2.3.2 *Attitudinal variables' consequences*

The review of selected studies demonstrated that avatars or the virtual characters have a significant impact on a number of attitudinal variables. These variables include, for example, social presence, good relationships, trust, satisfaction, and engagement, as shown in Figure 4.4.

**Social presence.** Social presence is one variable related to avatars that has been extensively examined in the literature. The degree of social presence increases when users participate with avatars or embodied conversational agents as they elicit a sense of proximity in the virtual worlds or virtual communities (Animesh et al., 2011; Gerhard et al., 2004; Groom et al., 2009; Kim et al., 2007; Larach & Cabra, 2010; Qiu & Benbasat, 2009; Wasko, Teigland, Leidner, & Jarvenpaa, 2011). Avatars provide means for the social presence (Aljukhadar & Senecal, 2011; Kim et al., 2007; Li et al., 2011; Montoya et al., 2011; Schwarz et al., 2012). These factors include avatars' body and head movements, simultaneous representations of users, representations of agents, verbal and textual communications, and gestures; more important is the responsiveness of the other parties (Franceschi et al., 2009). Interactions with other avatars lead to an emotional state of being with others (Schwarz et al., 2012). Participants felt a stronger sense of social presence after they saw an embodied agent with the humanoid embodiment (Qiu & Benbasat, 2009). In addition, adding facial movements to avatars strengthen the sense of presence (Franceschi et al., 2009).

Compared to the real world, an avatar provides levels of co-presence and mutual awareness, but not the same level of co-presence as a real person (Argelaguet, Kulik, Kunert, Andujar, & Froehlich, 2011). Including text with the virtual character elicited more positive social

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evaluations than the presence of only one component (Lee, 2008). In contrast to the previous views, virtual characters had no impact on the perceived sense of social presence (Hoffmann & Krämer, 2013; Qiu & Benbasat, 2009), and adding a voice channel to the agent interface was not sufficient for enhancing social interactions between the users and the product recommendation agents (Qiu & Benbasat, 2009).

**Good relationships.** A number of previous studies have asserted the impact of avatars when providing good relationships with users. For example, interfacing virtual agents can maintain good relationships with users by considering each user's interaction preferences and assistance requirements (Schiaffino & Amandia, 2004). Reality users' avatars were more motivated by social interactions and relationship formation than fantasy users' avatars (Melancon, 2011). The affective connections or relationships between users and interface characters were established by both the character's visual appearance and the affordances it offers (van Vugt et al., 2006).

**Trust.** Trust is one of the most essential components for all types of interpersonal interaction as, when people do not trust, they do not believe what others say, get experience or learn from them, engage in monetary or affective transactions, or allow themselves to reveal personal information and become more intimate (Cassell & Bickmore, 2000). Technology designers mainly aim to make the human-computer interaction smooth by inspiring the cognitive state of trust (Cassell & Bickmore, 2000). The presence of avatars and/or virtual salespersons facilitates the development of trust (Komiak et al., 2005; Morrison et al., 2012; Mueller et al., 2011) as they provide a reliable visual representation (Bogdanov et al., 2013; Sanchez & Garcia-Rodicio, 2008; Wang et al., 2008). Compared with different media, empathic avatars are more trustful than the textual version (Lisetti et al., 2013), non-social characters, and physical characters, which was not expected (Looije et al., 2010). The human-like characters were perceived to be more trustworthy than the cartoon-like characters (Luo et al., 2006). The ECA can provide a



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trust relationship (Cassell, 2000; Qiu & Benbasat, 2009), especially when website users have not seen them before (Cassell, 2000). Several research streams have been developing, including the investigation into trust in avatars (Riedl, Hubert, & Kenning, 2010). The selection of an avatar in CMC can influence the multi-dimensional construct of trust (Morrison et al., 2012). The interaction with avatars could enhance the users' trust of the used technology (Cassell, 2000; Cassell & Bickmore, 2000). For instance, ECAs' verbal and nonverbal cues can improve their credibility, reliability and knowledgeability by presenting themselves as competent, fluid speakers, expertise, professional affiliation, and attractiveness based upon their appearance — that is, they trust the technology more (Cassell, 2000; Cassell & Bickmore, 2000). Supporting this point of view, avatar design — by showing even graphically simple avatars — can increase the users' trust in avatars (Benford et al., 2001). Pedagogical agents promoted learners' self-confidence by influencing learners' sense of autonomy and approval (Wang et al., 2008). The results indicated the significant impact of recommendation agent design on consumers' emotional and cognitive trust (Komiak & Benbasat, 2006).

Yet contrary to these findings, certain studies showed that some users explicitly stated their reluctance to trust the virtual agents as the information about the user's preferences is a prerequisite for enabling a virtual agent to guide them (Hertzum et al., 2002). There is no difference in the perception of trustworthiness of a communication partner between avatar-supported chat and text-only chat, although avatars provide a rich medium (Galanxhi & Nah, 2007). Adding visibility and physical presence to the agent would not necessarily make the additional information delivered by the auditory expressiveness more trustworthy (Sanchez & Garcia-Rodicio, 2008). Using false characters or avatars also resulted in a lack of trust in users' representations (Sutcliffe & Alrayes, 2012).

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In order to ensure the success of electronic commerce, agent technology must address consumers' concerns about trust, as it is very hard for consumers to trust unknown parties (MacKenzie et al., 2013; Maes, 1999). Adding avatars can help companies personalise interactions with consumers, reducing the impersonal limitations of websites' interfaces in which trust might be increased (MacKenzie et al., 2013). Communicating with a human-like agent on the recommendation agent site helps build trust (Aljukhadar & Senecal, 2011). Sales agent avatars can create a trusting belief in companies' competence through the capability process (Papadopoulou et al., 2001). Avatars' social interaction cues increase trust in online shopping sites (Keeling et al., 2010). In addition, the results show that both benevolence assessment and control processes contribute to trust in the virtual salespersons, whereas the connection process and interface assessment mainly contribute to distrust in the virtual salespersons whereas the expectation confirmation, information sharing, and competence assessment contributed to both trust and distrust in the virtual salespersons (Komiak et al., 2005).

**Consumer satisfaction.** Consumer satisfaction is another attitudinal variable examined with avatar use. A number of previous studies have showed that the avatar-enabled user interface provides more improved values for consumer satisfaction compared to traditional shopping (Holzwarth et al., 2006; Lee & Chung, 2005). In addition, the results revealed that members' attitudes towards social presence influenced their satisfaction with the use of an avatar in the virtual community context (Kim et al., 2007). The use intention of virtual characters and the involvement with them made significant contributions to end-users' satisfaction (van Vugt et al., 2006). In other words, the presence of an avatar makes users feel satisfied from the interface (Neviarouskay et al., 2010) or more delighted by coming alive to interact with them on the web (Hayes-Roth et al., 1999).

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**User engagement.** Embodied conversational agents or avatars create an opportunity for engagement (Blodgett & Tapia, 2011; Hemp, 2006; Vicdan & Ulusoy, 2009) in a variety of activities in a shared space (Menneck et al., 2008). They provide cues or means that increase the user's engagement (Bogdanov et al., 2013; Stevens et al., 2013). They are capable of engaging users through nonverbal modalities, including gesture, gaze, intonation, and posture, as well as speech (Cassell, 2000; Cassell & Bickmore, 2000). One of the specific relational-marketing strategies in the virtual world (VW) environment is to populate the companies' VW space with human-like avatars that can interact with visiting consumers in order to continuously keep the consumers engaged (Oyedele & Minor, 2011). The majority of users who listened to an iPhone advertisement conveyed by an Apple spokes-avatar scored higher product involvement than those who did not encounter the spokes-avatar (Jin & Bolebruch, 2009).

**Self-disclosure and deception.** The interaction with embodied conversational agents can lead to a lack of hesitancy and increased self-disclosure (Cassell, 2000). Previous studies provided evidence that more attractive avatars tend to be more intimate with partners in terms of self-disclosure (Haenlein & Kaplan, 2009). Their role in encouraging self-disclosure or talking about the self is an important aspect of building trust (Cassell, 2000). Furthermore, the review of the literature displayed the impact of avatars on the deception variable. The results showed that, in the avatar condition, anonymity can be further increased by 'wearing a mask' to confuse or distract the recipient about one's identity (Galaxhi & Nah, 2007).

**Perceived better task performance and ambiguity.** The properties of the avatars used in a realistic, task-focused approach appeared to be crucial to task performance, motivating users to continue to use the avatars in similar contexts (Suh et al., 2011). Scholars have argued that better performance is connected with the presence of avatars (Sutcliffe & Alrayes, 2012). They can use a kind of small talk, such as 'conversational story telling', to help consumers in

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achieving their task goals (Cassell, 2000). Life-like characters with affective behaviours including the display of empathy can positively influence users' perceptions of task difficulty (Prendinger et al., 2005). Regarding the perceived task ambiguity, the results showed that contrary to the real world, avatars introduce an element of ambiguity (Vasalou et al., 2008). It is preferable to use avatar email rather than traditional email in the low ambiguity tasks, which is the opposite of richness theory (Lee et al., 2005).

**Persuasiveness and attitude towards product.** Previous research has presented that avatars can increase the consumers' persuasion towards products/online sales channels (Holzwarth et al., 2006; Wang et al., 2007), but the degree of increase mainly depends on the avatar type whether an attractive avatar or expert avatar (Holzwarth et al., 2006). They can also influence the attitude towards the product. For example, the results indicated that consumers who interacted with a sales agent avatar had a more favourable attitude towards the product than those who did not see it (Hansen, 2009; Holzwarth et al., 2006). Another study also revealed that a significant difference exists between the spokes-avatar and non-spokes-avatar conditions regarding the attitude towards the product that all users who listened to the advertisement conveyed by an Apple spokes-avatar were significantly higher mean scores for the attitude towards the product measure than before (Jin & Bolebruch, 2009). The users who reviewed the cartoon spokesperson generated a more favourable attitude towards the advertisement and the brand (Heiser, Sierra, & Torres, 2008).

**Perceived playfulness, enjoyment or entertainment.** Designers of agents create more human-like agents to make interactions more meaningful and enjoyable for users (Groom et al., 2009). The results revealed that user interfaces with avatars were significantly different regarding the explanatory variable 'playfulness' (Lee & Chung, 2005; Prendinger et al., 2005). Web agents and synthetic characters can be a source of entertainment (Breazeal, 2003; Melancon, 2011).

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The perceived playfulness or enjoyment was an outcome of advanced interfaces, such as avatar-mediated activities or software recommendation agents (Qiu & Benbasat, 2009; Schwarz et al., 2012). Many users assigned their avatars as a source of entertainment value (Vasalou et al., 2008). The presence of an avatar makes users enjoy the interface (Neviarouskay et al., 2010). Users believed that the advertisement messages by a spokes-avatar were more entertaining than the messages, without the presence of a spokes-avatar (Jin & Bolebruch, 2009). In contrast, users rated avatars as less enjoyable even when they used the emotional avatars (Beale & Creed, 2009).

**Avatar's/virtual character's affability.** The results showed that the character's affability included an index of three items: friendliness, helpfulness, and likability (Cowell & Stanney, 2005). In terms of perceived friendship, social virtual characters scored highly on items such as empathy and friendliness (Looije et al., 2010). Creating artificial characters can perhaps establish some sort of friendship (Persson et al., 2001). The results demonstrated that the fully embodied agents (rather than two-dimensional or three-dimensional heads) or graphical users' interfaces were thought to be friendlier (McBreen & Jack, 2001; Virvou & Kabassi, 2004). In other words, the fully embodied agents might play a more important role in increasing users' perceptions of agent friendliness (McBreen & Jack, 2001). Using avatars on recommendation agents' sites would help deliver a friendlier RA site (Aljukhadar & Senecal, 2011). Furthermore, in terms of perceived helpfulness, users were keener to use helpful virtual characters, which aid in task completion (van Vugt et al., 2006). The results demonstrated that the fully embodied agents were thought to be more helpful; in particular, female agents were perceived to be significantly more helpful than male agents (McBreen & Jack, 2001). Finally, regarding consumer likeability, the results revealed that the majority of consumers prefer to shop on the Internet for products with an avatar shopping assistant (Keeling et al., 2010). The

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users perceived the social/human-like characters to be more likeable (Luo et al., 2006; Wang et al., 2007) than the cartoon-like characters, which in turn leads to trust (Luo et al., 2006). Adding an empathic (well-animated) avatar affected the likability of the system (Lisetti et al., 2013). In addition, speech–gesture cooperation also affected users’ likeability ratings of virtual agents (Buisine & Marti, 2007). However, it is important to note that the communication channel preference depends on consumers’ level of technology orientation; traditional users showed a lower preference for technology-based communication modes (i.e., virtual agents) (Birgelen et al., 2012).

**Perceived self-extension.** Users perceived their avatars to be alternative selves or an extension of themselves in the virtual world and only transferred part of themselves, generally the most positive aspects (Animesh et al., 2011; Belk, 2013; Parmentier & Rolland, 2009). For example, one of the participants stated that ‘I didn’t create my avatar as an extension of myself, but as an autonomous “thing”; I really created it from different parts’ (LI) (Parmentier & Rolland, 2009).

**Consumers’ privacy.** A noticeable challenge is consumers’ privacy worries about the detailed tracking of avatar data (Hemp, 2006). In other words, to ensure the success of electronic commerce, agent technology must address consumers’ concerns about privacy (Maes, 1999). The results revealed that the users prefer to interact with, in terms of perceived privacy, a real/human counsellor rather than a non-real virtual counsellor (Lisetti et al., 2013).

**Avatar/character aptitude.** Character aptitude refers to the character’s intelligence (Cowell & Stanney, 2005). The results revealed that the empathic avatar was perceived to be more intelligent than the textual version (Lisetti et al., 2013). However, no significant difference was evident in users’ emotions regarding the artificial affective intelligence (Neviarouskay et al., 2010).

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**Other variables.** Additional variables were examined by one or two studies. They include, for example, perceived distraction, perceived attractiveness, perceived politeness, attachment, and nostalgia. Users perceived a full-bodied agent as the most distracting, making it the least-preferred option; meanwhile, the head-only representation was the most preferred as it was less distracting and took up less space (Chattaraman et al., 2011). In addition, the results revealed that the avatar's condition was more interrupted than the video condition (Clayes & Anderson, 2007). In terms of perceived attractiveness, an avatar's attractiveness significantly affects the causal attribution towards the product's performance (Lee et al., 2013). However, the results showed that the video condition attracted users more than avatar icons (Clayes & Anderson, 2007). Regarding perceived politeness, the results demonstrated that the fully embodied agents were thought to be more polite and could thus enhance participants' perceptions of politeness (McBreen & Jack, 2001). Students' interactions with polite agents had a positive impact on students' learning outcomes (Wang et al., 2008). Avatars can also influence the real self or individual by increasing the attachment to avatars (Belk, 2013). In addition, avatars can increase the feelings of nostalgia as they are experienced as a form of expression of a past that contributes even more to the re-enchantment of the consumption experience (El Kamel & Rigaux-Bricmont, 2011). In terms of human emotions, the avatar's behaviours are crucial as they induce the emotional response in the users (Whitton, 2003). Finally, making avatars look like users' real selves reflects the self-esteem gained in Second Life on their real-life experiences (Vicdan & Ulusoy, 2009).

#### *4.2.3.3 Behavioural variables' consequences*

A number of behavioural variables have been recognised in the literature reviewed, such as interaction, length of time spent on the website, purchase decision, and co-creation.

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**Interaction.** Avatars provide new ways for people to interact with others over global computer networks (Gerhard et al., 2004; Halvorson et al., 2012). Using an avatar or a self-created avatar increases the probability of interactions occurring among many users in common virtual environments, Second Life, and/or shared environments (Animesh et al., 2011; Bylund & Espinoza, 2002; Franceschi et al., 2009; Haenlein & Kaplan, 2009; Luciano et al., 2001; Michon & El Antably, 2013; Nah et al., 2011; Schillewaert et al., 2009). The results demonstrated the positive behavioural outcomes of interacting with emotional agents (Beale & Creed, 2009). ECAs have the abilities to interact with users (Castellano et al., 2012; Goel et al., 2011). Avatars can provide cues to facilitate strong social interaction among users (Bogdanov et al., 2013; Hoffmann & Krämer, 2013). By using avatars, users often react with the avatars socially, as though they were interacting with the individuals that the avatars might represent (Larach & Cabra, 2010; Morrison et al., 2012). The users preferred embodied agents who can actively interact with them (Schiaffino & Amandia, 2004). In addition, the users can interact socially with human-like interface agents (Prendinger et al., 2007). This interaction can result from the real or perceived presence of other individuals (Wang et al., 2007).

In e-commerce, companies should use avatars representing real people to increase the sociality of interaction (Tikkanen et al., 2009). The quality of interactions on the websites can be enhanced through avatars by providing facial expressions to express feelings and attitudes with graphic emoticons (Pollach, 2008). A consumer is able to visit the website in the form of an avatar and engage in shopping activities by interacting with the salesperson avatars (or web assistants) that act as agents (Florenthal & Shoham, 2010; Papadopoulou et al., 2001). In addition, avatars created by online marketers or online shoppers conversationally interact with other consumers (Wood & Solomon, 2008). As technology's development is accelerating, the idea of consumers interacting through avatars with their bank accounts or financial planners is



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not peculiar (Hershfield et al., 2011). A newcomer's adjustment (e.g., self-efficacy, role clarity and social acceptance) is affected by the agent–consumer interaction in terms of content (functional content and social content) and style (reactive and proactive styles) (Köhler et al., 2011). Furthermore, avatar-based virtual world education is highly interactive and provides a richer experiential environment than textbook or traditional written assignments (Belei, Noteborn, & de Ruyter, 2011). Motivating users to interact more frequently with agent-based educational software produces significant cumulative improvements in the quality and effectiveness of an educational programme over time (Marakas et al., 2000).

**Purchase intention.** A number of previous studies have shown that the avatar-enabled user interface provides high purchase intention in online shopping (Holzwarth et al., 2006; Lee & Chung, 2005). The social interaction cues within the avatar encourage buying from an online shopping site (Keeling et al., 2010). The spokesperson cartoon advertisement increased the purchase intention for the brand (Heiser et al., 2008). Regarding the decision quality, the avatar-enabled user interface provided higher values for decision quality compared with the ordinary shopping mall (Lee & Chung, 2005).

**Co-creation and length of time.** Virtual consumers represented by avatars were used as co-creators from which the development of a co-creation system can greatly benefit, making them co-creators of the system (Köhler et al., 2011). Another behavioural variable affected by avatars is the length of time spent on the website. The previous research revealed that avatars probably increased the length of time consumers spent on the website and, hence, positively influenced the experience with a brand's offerings (MacKenzie et al., 2013). Users talk significantly longer in the presence of an ECA (Cassell, 2000).

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#### ***4.2.4 Mediator and moderator variables linked by avatars***

##### *4.2.4.1 Avatars and mediator variables*

Eleven variables in the selected studies emerged to mediate some relationships between avatars and other variables: websites' entertainment value and informativeness, avatar likeability, avatar credibility, avatar identification, emotional attachment, perceived diagnosticity, perceived relevance or perceived valence, perceived advertisement creativity and newcomer adjustment (see Table 4.1).

Both websites' entertainment value and informativeness mediate the impact of avatars on consumers' satisfaction with the retailers, attitude towards the product, and purchase intention (Holzwarth et al., 2006). The interaction with a human-like agent at the RA sites would result in a more informational RA service (Aljukhadar & Senecal, 2011). In addition, avatar likeability mediated the influence of avatar type (attractive avatar) on satisfaction with the retailer, attitude towards the product, and purchase intention, and the avatar credibility was rejected as a mediator in that case (Holzwarth et al., 2006). Avatar credibility mediated the impact of avatar type (expert avatar) on the satisfaction with the retailer, attitude towards the product, and purchase intention, but avatar likeability was rejected as a mediator in this case (Holzwarth et al., 2006). The results further revealed that, through the mediation of these three variables, the positive attitude and usefulness of the avatar are important factors for increased intention to use the avatar (Suh et al., 2011). In terms of perceived relevance and perceived valence, the similarity and affordance of embodied agents indirectly affected the distance and users' use intentions via these explanatory or mediator variables (e.g., perceived relevance or perceived valence) (van Vugt et al., 2010). The results further indicated that perceived advertisement creativity fully mediated the impact of the spokesperson type on advertising outcomes (Heiser et al., 2008). Finally, newcomer adjustment (e.g. self-efficacy, role clarity

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and social acceptance) significantly mediated the relationships between agent–consumer interactions in terms of content (functional content and social content) and style (reactive and proactive styles) and performance (Köhler et al., 2011).

#### *4.2.4.2 Avatars and moderator variables*

Seven variables emerged from the selected studies and moderated the relationships between avatars and other variables: consumer involvement, gender, age, consumers’ reviews, propensity to trust, desire to be present and compare themselves with others and users’ regional differences (see Table 4.1).

The avatar’s influence on persuasion, attitude towards the product and purchase intentions was moderated by consumer involvement, particularly at moderate levels of involvement (Holzwarth et al., 2006). In addition, the results showed that gender fully moderated the effect on types of avatar differences in terms of self-identity and self-disclosure as females preferred to enjoy the imaginary expressions of avatars with strangers and are more comfortable when it comes to self-disclosure with their friends (Kang, 2006). In addition, the users also differed in their choice of avatars and their propensity to trust others online based on their gender (Galaxhi & Nah, 2007). The results presented that gender moderated the relationship between avatars and trust (Morrison et al., 2012). Agent gender showed a significant effect: Masculine agents were significantly friendlier than the feminine agents (McBreen & Jack, 2001). In contrast, the impact of the avatar on trust towards the website did not differ based on security worries and gender (Keeling et al., 2010). The moderating role of user’s gender was confirmed on social presence and perceived enjoyment, but not perceived usefulness (Qiu & Benbasat, 2010). Furthermore, the results revealed that age partially moderated effect on the differences of avatar types in terms of self-disclosure, as this effect was obvious for the opinion and capability factors of self-disclosure (Kang, 2006). Consumers’ reviews moderate the impact of avatar facial

expressions (happy versus angry looking) on the intention strength to purchase the brand (Lee et al., 2013). In addition, users with a low tendency to trust perceived their avatars to be significantly less trustworthy and credible than those users with a medium or high tendency to trust (Cowell & Stanney, 2005). In terms of the desire to be present and compare themselves with others, the results showed that members with such a desire in the virtual community are more likely to be satisfied with the use of an avatar (Kim et al., 2007). Finally, regarding users' regional differences, a UK sample was significantly more likely to want all forms of avatar help than North American and Oceania users, who wanted either friendly help or all types of help (McGoldrick et al., 2008). The moderating role of user's ethnicity match was confirmed on social presence and perceived enjoyment, but not perceived usefulness (Qiu & Benbasat, 2010).

#### ***4.2.5 Demographic characteristics linked by avatars***

The results of experiments indicated that the preferred style for an ECA depends on users' characteristics (Noot & Ruttkay, 2005). Three main demographic characteristics emerged from the literature review and were examined by a number of scholars: users' and avatars' gender, users' age and users' online buying experience.

<b>Independent Variables</b>	<b>Mediator Variables</b>	<b>Dependent Variables</b>
Attitude toward avatar Usefulness of avatar	Avatar identification Emotional attachment Perceived diagnosticity	Avatar / intention to use avatar
Similarity Affordance	Perceived relevance Perceived valence	Avatar / intention to use avatar
Avatar / intention to use avatar	Website entertainment Website informativness Avatar likeability Avatar credibility	Satisfaction Attitude toward product Purchase intention
Avatar / intention to use avatar	Perceived creativity	Advertising outcome
Avatar / intention to use avatar	Newcomer adjustment	Customer performance
<b>Independent Variables</b>	<b>Moderator Variables</b>	<b>Dependent Variables</b>

Avatar / intention to use avatar	Involvement Customer reviews Desire to be present	Satisfaction Attitude toward product Purchase intention
Avatar / intention to use avatar	Propensity to trust Gender	Trust
Avatar / intention to use avatar	Gender	Friendliness
Avatar / intention to use avatar	Gender Regional differences Age	

**Table 4. 1 Summary of mediators and moderators linked by avatar concept**

**Users' and avatars' gender.** The role of users' or avatars' gender, compared to the other demographic variables, was extensively investigated in examining the effects of avatars. One of the essential issues is the choosing of virtual agents'/avatars' gender and appropriate voices (McBreen & Jack, 2001). Significant differences between providers' offering and users' preference in terms of agent gender appeared (Chattaraman et al., 2011). The results revealed that users often choose Internet avatars' gender to be the opposite of their own sex (Galaxhi & Nah, 2007; Smith, 2002). In the commercial context, the consumer may choose a masculine or feminine avatar irrespective of his or her real gender (El Kamel & Rigaux-Bricmont, 2011). However, other results revealed that users follow stereotypical gender patterns when communicating with avatars that present as either masculine or feminine (Brahnam & De Angeli, 2012). From another point of view, the influence of the user's gender had no significant influence in any case (Buisine & Marti, 2007). The results showed highly significant effects for agent gender. Users prefer to use the service when the human-like agent is male; however, in another experiment in the same study, the general preference was for the three-dimensional fully embodied female agent (McBreen & Jack, 2001). Furthermore, female users had a greater propensity to trust feminine characters, unlike male users, who had a lower level of trust perception in cartoon-like characters and increased perception in human-like characters (Luo et al., 2006). The male embodied models led to a greater perception of expertise and more

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trustworthiness than the female embodied models, which were perceived as more likable (Nunamaker et al., 2011). Female users thought that feminine agents were more polite than masculine agents, and male users thought that masculine agents were more polite than feminine agents (McBreen & Jack, 2001). The results also showed that the cartoon-like feminine character was preferred in the interactive situation (Luo et al., 2006) and was more effective at reducing frustration than the masculine character (Beale & Creed, 2009). The computer's gender had a significant influence on conformity only in the text-plus-character condition; for example, males were more resistant to informational influence than females, but only when a female computer was provided (Lee, 2008). Younger male users (vs. females) were perceived as more agreeable by the perceivers (Bélisle & Bodur, 2010). In other study, females found that the agent spoke and moved in a more human-like manner than the males, although there were no significant differences (van der Sluis et al., 2012). Males were less likely to want help from avatars, and they were less likely to appreciate the friendly roles of an avatar (McGoldrick et al., 2008). The male embodied agents were perceived by users to be more powerful (Nunamaker et al., 2011). Furthermore, females and self-similar agents induced higher use intentions than dissimilar agents in both conditions (aids or obstacles agents); however, male users with self-similar and aiding male agents provoked a considerable level of use intentions, but this level dropped to its lowest point when the self-similar male agent was obstructive (van Vugt et al., 2010). Regarding the attitude to gesturing, the results showed that users significantly preferred the female gestures to the male gestures (McBreen & Jack, 2001). However, the results showed that gender did not significantly influence the users' perceptions (Wang et al., 2007).

**Users' age and the users' online buying experience.** Users' age can be considered the second demographic variable which investigated for its impact on the relationships between avatars and other variables or constructs. Younger age groups were less likely than others to need help

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from avatars but more likely to need functional help (McGoldrick et al., 2008). In addition, virtual agent providers revealed a tendency to offer more static agents than animated ones, with varying degrees of animation that may or may not be appropriate for older users, who also preferred the agent to be represented through the head/face only and no specific preference in agent gender (Chattaraman et al., 2011). In contrast, no significant differences were found among users with respect to users' age (Qiu & Benbasat, 2009; Wang et al., 2007). The third demographic variable is the users' online buying experience. Users who spent more time making purchases online were less likely to have less need for avatar help (McGoldrick et al., 2008). However, no significant differences were found among groups with respect to users' years of Internet experience (Qiu & Benbasat, 2009; Wang et al., 2007).

**Service type.** Important results emerged regarding the impact of applications or service types on perceiving agents as a communication tool. For instance, the results revealed that feminine agents in the CD service were significantly friendlier than those in the home furnishing service (McBreen & Jack, 2001). In addition, the results revealed that the virtual agents presenting photocopiers were likeable than those presenting remote controls or software (Buisine & Marti, 2007).

The discussion of this section has identified the variables linked to the avatar concept. The next section will highlight the significant gaps noted while reviewing the literature and show the importance of conducting the current research.

### **4.3 Gaps in the literature**

The gaps in the literature include those clearly stated in previous studies and those that emerged from conducting the systematic reviews.

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### 4.3.1 *Gaps highlighted in previous studies*

Significant gaps have been identified in preceding studies and should be taken into consideration in the current research, as follows:

**Avatar concept is still in its infancy:** A number of recent studies have identified that the avatar concept is just beginning to be understood and needs more future research to explore it. For example, researchers, particularly those in the marketing discipline, need to understand the concept of avatars, especially for commercial websites, in order to be able to capture its consequences on commercial relationships, consumer decision making and its effects on consumption and exchanges as it is still in its infancy (Garnier & Poncin, 2013; Poncin & Garnier, 2012). Forthcoming investigation can advance understanding on the occasions that give rise to embodied messages of avatars (Vasalou et al., 2008). Learning how to conduct business using avatars on websites has theoretically significant and yet relatively unexplored implications (MacKenzie et al., 2013). Further investigations are necessary as the literature offers little about the effects of avatars in commercial websites as assistants (Keeling et al., 2010). The scope of key roles of avatars as online assistants on transactional websites is still limited (McGoldrick et al., 2008). Furthermore, empirical research is needed to understand associations between avatars and consumers (Jin & Sung, 2010).

**Avatar characteristics:** Little quantitative evidence exists about the influence of avatar characteristics (e.g., avatar similarity) on avatar usage (Suh et al., 2011) and the deeper understanding of the benefits and drawbacks of avatar use (Galanxhi & Nah, 2007). In addition, there is a lack of evidence on the relationship between avatar attractiveness/appropriateness and interactions as might happen with repeated visits to the websites (Belk, 2013; Wood & Solomon, 2008). The effects of photorealism is an important issue in avatar research, but achieving true visual realism is very difficult because of its technical constraints (Groom et al.,



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2009). Future research should establish how an avatar's appearance influences emotion recognition (Visschedijk et al., 2013).

**Consumers' attitudes and behaviours:** Future research is needed for a new theoretical framework theorising the users' attitudes and intentions concerning avatars (Suh et al., 2011). Upcoming studies should examine additional factors that may be related to satisfaction with avatars (Jin et al., 2007) and trust as little research has examined the influence of avatars on users' trust in the online context (Morrison et al., 2012). Further examination is needed to empirically investigate the impact of avatars on marketing consequences (e.g., perceived value, attitude towards site brand, loyalty, intention to use or visit, intention to purchase and passive word-of-mouth intention) and individual consequences (e.g., emotional reactions, socialisation and task performance) (Garnier & Poncin, 2013).

**Demographic and cultural effects:** Further research is needed to examine the impact of demographic and cultural characteristics in establishing how an avatar's appearance influences users' perceptions (Visschedijk et al., 2013). Future research could also assess the usage and effectiveness of avatars for different age markets (Heiser et al., 2008), different user ages (Garnier & Poncin, 2013), consumer's knowledge of the product (high versus low) (Holzwarth et al., 2006) or multicultural contexts (Ben Mimounn et al., 2012). The fit between avatar services and cultures can be one of the key factors in the success of an avatar (Kang, 2006). Marketers may want to know how to distinguish between consumers willing to use avatars and those reluctant or unwilling; therefore, it can be a potential area for further research (Jin et al., 2007).

**Moderators' constructs:** Researchers should examine other moderators, such as consumer search strategy (Wang et al., 2007), familiarity with avatars and the age of users (Galanxhi &

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Nah, 2007; Garnier & Poncin, 2013). It is important to study the use of avatars in other areas or diverse applications, such as education (Galanxhi & Nah, 2007).

#### *4.3.2 Gaps identified from the systematic literature review*

Significant gaps were identified while reviewing the previous studies and adopting the systematic literature reviews approach. These areas should be taken into consideration in the current research, as follows.

First, the results of the systematic literature review (Chapter Two) revealed a lack of examination of the avatar concept, particularly in business and marketing disciplines confirming the results of some previous studies (see subsection 4.2.1). Therefore, further investigations of the avatar concept are urgently needed to understand it deeply.

Second, very little attention has been paid to identifying avatars' key characteristics that make it successful in delivering its tasks on the websites and, thus, their effects on the consumers' attitudes and behaviours. Therefore, it is valuable to investigate this concept in a deep way in order to identify the key successful characteristics of avatars on the websites and demonstrate the main attitudinal and behavioural constructs resulted from avatar use. In particular, reviewing the literature (in the relationships between avatars and behavioural constructs in this chapter) revealed a lack of research on avatars' effects on users' behaviours (see Figure 4.2).

Third, most extant studies on avatars have been conducted in virtual worlds (e.g., Second Life), whereas few studies have examined it as a tool on websites (particularly commercial websites). The review indicated that scholars examined the effects of using avatars in different contexts (e.g., e-commerce, gaming and education settings) and products, such as mobile phones and shoes. Indeed, a number of previous studies examined avatars in the educational (teaching and

learning) context. However, no study has examined the effects of using avatars on university websites as an administrator doing administrative work for potential and current students.

Addressing these gaps in the literature led to the current research which aims to develop a theoretical framework called admin-avatar framework. This framework theorises an appropriate definition of the admin-avatar, the successful characteristics of the admin-avatar and its potential effects on university students' perceptions whether towards their attitudes or behaviours.

#### **4.4 Chapter summary**

In this chapter, the relationships between avatars' dimensions and other variables were identified. The antecedents and consequences of using avatars were also displayed in more detail. Thereafter, mediator variables, moderator variables and demographic characteristics linked with avatars in the previous studies were presented. Finally, the gaps in the literature were illustrated. The next chapter demonstrates the adapted philosophy, methodology and research methods in more detail.

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## **Chapter Five: Research methodology and data collection**

### **5.1 Introduction**

The preceding three chapters have illustrated the paucity of studies investigating the avatar concept, particularly from business and marketing perspectives. The theoretical background of the avatar concept and its relationships with other constructs examined in the previous studies have been presented. Identifying the research gap indicated the need for deep insights into the admin-avatar concept, its dimensions and the consequences of using it. This chapter outlines, explains and justifies the methodology employed for theorising the admin-avatar concept, emerging the related constructs and empirically validating the identified conceptual models. As shown in Figure 5.1, this chapter commences with presenting the different philosophical paradigms, particularly those in social sciences, choosing the appropriate one and its application to the current research. This is followed by a discussion of the research design types and the reasoning behind the chosen design. Next, an inclusive description of the chosen design — namely, the exploratory sequential design — is outlined. The exploratory sequential design encompasses two phases, where each phase addresses one or more objectives of the current study. Phase one comprises developing (a) an appropriate definition of the admin-avatar concept and (b) a taxonomy of the admin-avatar, including the dimensions, conditions and main consequences of using admin-avatar. Phase two includes two main studies as an attempt to empirically validate parts of the emerged taxonomy. In each phase, the chosen method for data collection is displayed. Finally, the rationale for selecting the university as the context is outlined. The chapter ends with a summary.

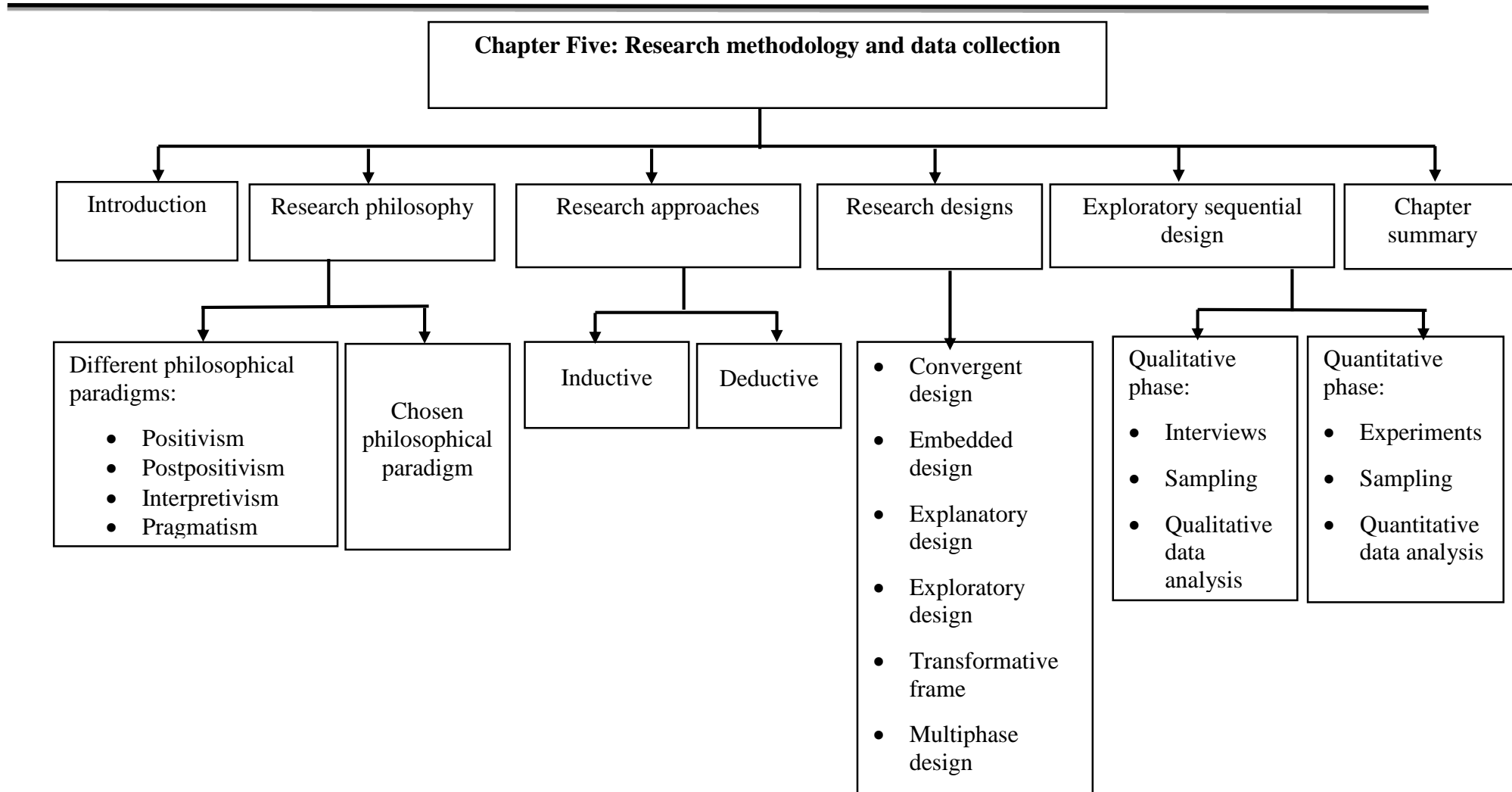


Figure 5. 1 Chapter Five map

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## 5.2 Research philosophy

Research philosophy ‘refers to the conceptual roots undergirding the quest for knowledge’ (Ponterotto, 2005, p. 126) and basic beliefs that guides action (Denzin & Lincoln, 2005). Beliefs or assumptions with respect to ontology, epistemology, axiology, rhetorical structure, and methodology are incorporated within philosophy (Ponterotto, 2005). The research philosophy can also be referred to as a worldview or paradigm (Creswell & Clark, 2011). It is valuable to discuss some concepts before examining the differentiation between the main philosophical paradigms. These concepts include worldviews, paradigms, ontology, epistemology, axiology and methodology that contain important differences which influence the researcher’s approach to the research process (e.g., Creswell & Clark, 2011; Easterby-Smith et al., 2004; Saunders et al., 2009). A worldview describes a set of assumptions or beliefs about knowledge that informs the researcher’s study (Creswell & Clark, 2011). The word *paradigm* is used synonymously with worldview (Creswell & Clark, 2011). Paradigm is the worldview of the researchers, and a better philosophical paradigm is one which achieves the research objectives or answers to the research questions (Denzin & Lincoln, 2005; Saunders et al., 2009). Ontology refers to the branch or subdivision of philosophy or philosophical assumptions concerned with the nature of reality or being (e.g., Easterby-Smith et al., 2004; Midgley, 2000; Ponterotto, 2005). Epistemology is related the nature of knowledge (Midgley, 2000) or the researcher’s view with respect to what constitutes acceptable knowledge (Saunders et al., 2009) or the relationship between the knower/participant and the would-be knower/researcher (Ponterotto, 2005). It organises and explains knowledge in the form of theories (Lancaster, 2007). Axiology refers to the researcher’s view of the role of values in the research (e.g., Creswell & Clark, 2011; Saunders et al., 2009). Methodology refers to a set of techniques used to investigate a specific situation (Easterby-Smith et al., 2004) or the process and procedures of the research,

where the research method flows from one's position on ontology, epistemology, and axiology (Ponterotto, 2005).

### ***5.2.1 Different philosophical paradigms***

It is common to begin thinking about the philosophical paradigm in order to identify the appropriate data collection and data analysis techniques. According to Saunders et al. (2009), five stages exist and should be considered before determining suitable data collection data analysis techniques — namely, the philosophical paradigm, research approach, research strategy and research choice. The researchers usually begin with the philosophy of the research, which is a comprehensive term that relates to the development and nature of the knowledge, including important assumptions about the way in which the researcher views the world (Saunders et al., 2009). These assumptions are often used to justify what can be considered valid practice (Midgley, 2000) and reinforce the adopted researcher's research strategy and method(s) (Saunders et al., 2009).

The research literature presented varies in terms of philosophical paradigms or worldviews from which researchers can choose for their research. In this section, the most common and frequently presented philosophical paradigms — namely, interpretivism, positivism, postpositivism and pragmatism — are discussed in order to identify the most appropriate paradigm(s) for the current study.

#### ***5.2.1.1 Interpretivism***

Interpretivism, also called constructivism or social constructionism, is typically related to the qualitative approaches that work from different perspectives (e.g., Creswell & Clark, 2011; Easterby-Smith et al., 2004; Saunders et al., 2009). The core of interpretivism is that understanding the phenomena is achieved through participants and their subjective views, which shape this worldview. In other words, it is essential to recognise the subjective meanings motivating the actors' behaviours in order to understand these actions (Saunders

et al., 2009). According to this philosophy, the ‘reality’ is subjective and interior and is socially constructed and given meaning by individuals (Easterby-Smith et al., 2004). The research is shaped from the individual perspectives to comprehensive patterns and, ultimately, to wide-ranging understandings (Creswell & Clark, 2011). The crux of interpretivism is that the individuals make sense of the world, particularly through sharing their experiences via the medium of language (Easterby-Smith et al., 2004).

#### 5.2.1.2 *Positivism*

The main idea of positivism is that the properties of the social world should be objectively measured through specific methods rather than being inferred subjectively through sensation, reflection and intuition (Easterby-Smith et al., 2004). The term *positivism* is adopted to describe the methodological procedures for attaining ‘positive’ knowledge of theory-neutral empirical facts by using mathematics (Goulding, 2002). Bryman (2012) defined positivism as an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond.

#### 5.2.1.3 *Postpositivism*

Postpositivism emerged as a result of the philosophical attacks on positivism and the serious challenges faced by social scientists when they tried to use the experimentalist methodologies of positivism (Greene, 2009). ‘The logical positivism was modified, becoming first logical empiricism (which replaced strong verification with a weaker condition called confirmation), and today it has become postpositivism (which is an extensively revised and more moderate philosophy of science’ (Tashakkori & Teddlie, 2010, p. 82). The methodological traditions that use a postpositivist framework have numerous procedures and techniques both for reducing bias and error and for evaluating how free the data actually are from such bias (Greene, 2009). These include the



standardisation of measures and their administration, estimates of reliability and validity coefficients, as well as statistical adjustments or unwanted variations.

#### *5.2.1.4 Pragmatism*

Pragmatism philosophy does consider that no predetermined frameworks or theories form the knowledge (Greene, 2009). The meaning of the developed structures or phenomena must come from individuals' lived experiences. One of the dominant ideas in pragmatism is that engagement in philosophical activity should be done in order to address problems, not to build systems (Tashakkori & Teddlie, 2010). In other words, pragmatism argues that the most important determinant of the epistemology, ontology and axiology the researchers adopt is the research question; one may be more appropriate than the others for answering particular questions (Saunders et al., 2009). There is a belief that postpositivism is related to quantitative approaches, constructivism is related to qualitative approaches, and advocacy and pragmatism are typically associated with mixed methods research (e.g., Alise & Teddlie, 2010; Creswell & Clark, 2007, 2011). Pragmatism offers an immediate and useful middle position philosophically and methodologically that chooses the combination of methods and procedures best for answering the research questions (Greene, 2009).

#### *5.2.2 The chosen philosophical paradigm*

According to Creswell & Clark (2007), when choosing a paradigm to follow, the researcher can consider one of three different points of view. (1) The best worldview that fits mixed methods research is pragmatism. (2) A multiple worldview can be used in the mixed methods research; using different paradigms produces contradictory ideas which reflect different ways of knowing about and valuing the social world. (3) Paradigms associated with the type of mixed methods design may vary depending on the type of design. This perspective considers mixed methods research as a 'method'. In addition, one view sees

researchers as not really combining qualitative and quantitative research as paradigms are incommensurable given that they are incompatible (Bryman, 2012).

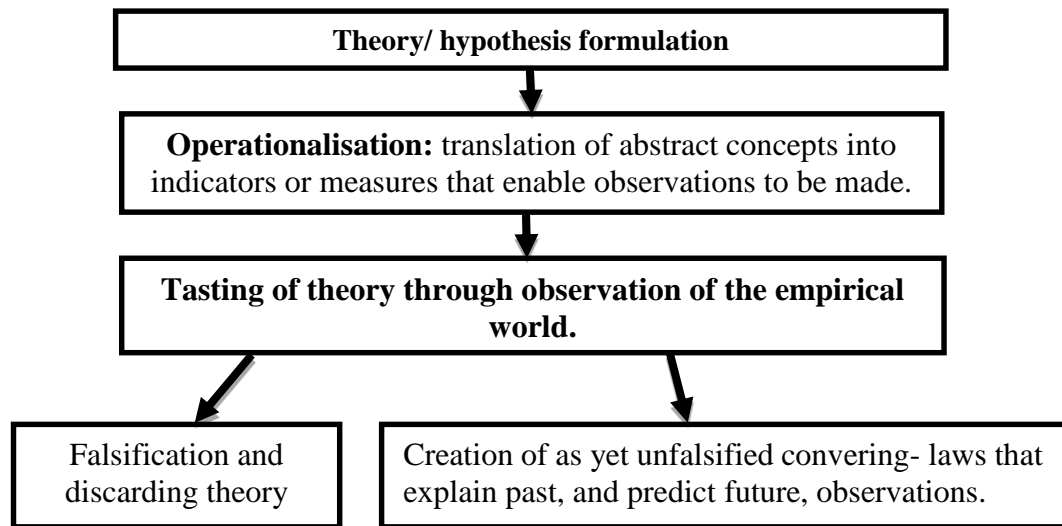
In line with Creswell and Clark, (2007, 2011), the current research adopts the third point of view — namely, paradigms are associated with the type of mixed methods design and may vary depending on the type of design. This is because there are different mixed method designs, and the researcher should identify the appropriate one. Each of these designs is recommended by adopting specific philosophy (ies). As the most appropriate mixed methods design for the current research is the exploratory sequential model (see in details in section 5.4 of this chapter), it is recommended that both constructivism and postpositivism are adopted (Creswell & Clark, 2011). As the adopted design starts qualitatively, the research problem and purpose often call for the qualitative component to have greater priority within the design. Therefore, researchers usually work from constructivist principles throughout the first phase of the research to value multiple perspectives and deeper insights. When the research moves to the quantitative phase, the fundamental assumptions may shift to those of postpositivism to identify and measure variables and statistical techniques. Therefore, multiple worldviews are used in this design, and the worldviews move from one phase to another (Creswell & Clark, 2011).

### **5.3 Research approaches**

Alternative approaches of thought with regard to the methodology of theory and knowledge building are deductive versus inductive approaches (Lancaster, 2007). The main differences between these alternative approaches to research are explained below to determine which approach is most appropriate for the current study.

#### ***5.3.1 Deductive approach***

The deductive research approach is the most widely used in the natural sciences (Lancaster, 2007). It aims to develop theories or hypotheses and then test them through empirical observations or a set of techniques in order to assess their validity (Lancaster, 2007). Gill and Johnson (2002) demonstrated the process of the deductive approach shown in Figure 5.2. The deductive research approach begins by generating theories or hypotheses to test out or a literature search bringing together the ideas of others (Lancaster, 2007). The second step in the deductive research is to operationalise these concepts. This step aims to convert the concepts in the theories or hypotheses in such a way that they can be measured through empirical observation (Lancaster, 2007; Saunders et al., 2009). According to Lancaster (2007), theory testing/empirical observation step involves identifying and deciding between alternative techniques and approaches for measuring the operationalised concepts as well as selecting and designing the research methodologies. The final step begins by deciding the extent to which the theory or hypothesis has been falsified and the extent to which parts, if any, of the theory/hypothesis remain unfalsified.



**Figure 5. 2 The process of deductive research approach (Gill & Johnson, 2002)**

### 5.3.2 Inductive approach

The inductive research approach is almost precisely the opposite of the deductive research approach. The inductive researcher develops hypotheses and theories to explain empirical observations of the real world (Lancaster, 2007). This means that the research is grounded on the principle of developing theory after collecting the data (Saunders et al., 2009). These empirical observations can be based on many aspects, such as personal experience (Lancaster, 2007). Perhaps the greatest strength of inductive research is its flexibility. This research approach does not require the establishment of *a priori* theories or hypotheses. The theories are built based on researchers' observations, thereby allowing a problem or issue to be studied or approached in several possibly different ways with alternative explanations of what is going on. It is particularly suited to the study of human behaviour, including of course behaviour in organisations. Inductive research also enables more flexibility in research design, including aspects such as sample size and type of data (Lancaster, 2007).

**Chosen approach.** Creswell and Clark (2007, 2011) argued that, in mixed method research, the researcher combines the two research approaches because s/he mixes both qualitative and quantitative data. To achieve the research objectives of the current study, a combination of inductive and deductive methods is used. Specifically, the qualitative design is required

to achieve the first three research objectives; thus, the inductive approach should be adopted, as mentioned earlier (Lancaster, 2007). Furthermore, the fourth research objective requires that the quantitative design be achieved, which means the deductive approach should also be used. Therefore, by adopting the mixed method design, both inductive and deductive approaches are combined. The current research begins, as will be shown in the next section, in the qualitative phase; subsequently, the quantitative phase is followed.

#### **5.4 The research designs**

The literature shows that the research should adopt one of the main research designs — namely, qualitative, quantitative or mixed methods design. The most appropriate design for achieving the research objectives is the mixed methods design. Specifically, the first three objectives are achieved by adopting a qualitative design. However, the last research objective is achieved by adopting a quantitative design. Thus, this section will expansively discuss the mixed method design and its types. By the end of this section, the appropriate type for the current research will be identified.

Six main types of mixed methods designs exist: convergent parallel design, embedded design, explanatory design, exploratory design, transformative frame, and the multiphase design. Table 5.1 summarises these designs and for more details see Creswell & Clark (2011).

Creswell and Clark (2011) identified four key principals that should be taken into consideration to make important decisions for choosing the appropriate mixed methods design in this research: (1) determining the level of interaction between the quantitative and qualitative strands; (2) determining the priority of the quantitative and qualitative strands; (3) determining the timing of the quantitative and qualitative strands; and (4) determining where and how to mix the quantitative and qualitative strands.

	Convergent parallel design	Embedded Design	Explanatory Design	Exploratory Design.	Transformative frame	The multiphase design
Definition	Concurrent quantitative and qualitative data collection, separate quantitative and qualitative analyses, combining the two data set.	The concurrent or sequential collection of supporting data analysis and the use of the supporting data before, during and or after collecting the main data procedures.	Methods employed sequentially beginning with quantitative data collection and analysis followed by qualitative data collection and analysis	Methods employed sequentially beginning with qualitative data collection and analysis followed by quantitative data collection and analysis	Framing the concurrent or sequential collection and analysis of quantitative and qualitative data sets within a theoretical framework that guides the method decisions.	Combining the concurrent and/ or sequential collection of quantitative and qualitative data sets over multiple phases of programme study.
Philosophy	Pragmatism	Worldview may reflect the primary approach (post positivist or constructivist) or pragmatism if concurrent. Constructivist for qualitative strand and postpositivist for the quantitative component if sequential	Postpositivist for quantitative (phase 1) Constructivist for qualitative (phase 2)	Constructivist for qualitative (phase 1) Postpositivist for quantitative (phase 2)	Transformative worldview	Pragmatism if concurrent. Constructivist for qualitative phase and Postpositivist for quantitative phase if sequential
Level of interaction	Independent	Interactive	Interactive	Interactive	Interactive	Interactive
Priority of the strands	Equal emphasis	Either quantitative or qualitative emphasis	Quantitative emphasis	Qualitative emphasis	Equal, quantitative, or qualitative emphasis	Equal emphasis
Common variant	Parallel databases	Embedded experiment Embedded correlational design Mixed method case study	Follow-up explanations Participant selection	Theory development Instrument development	Feminist lens Disability lens	Large-scale program development and evaluation projects

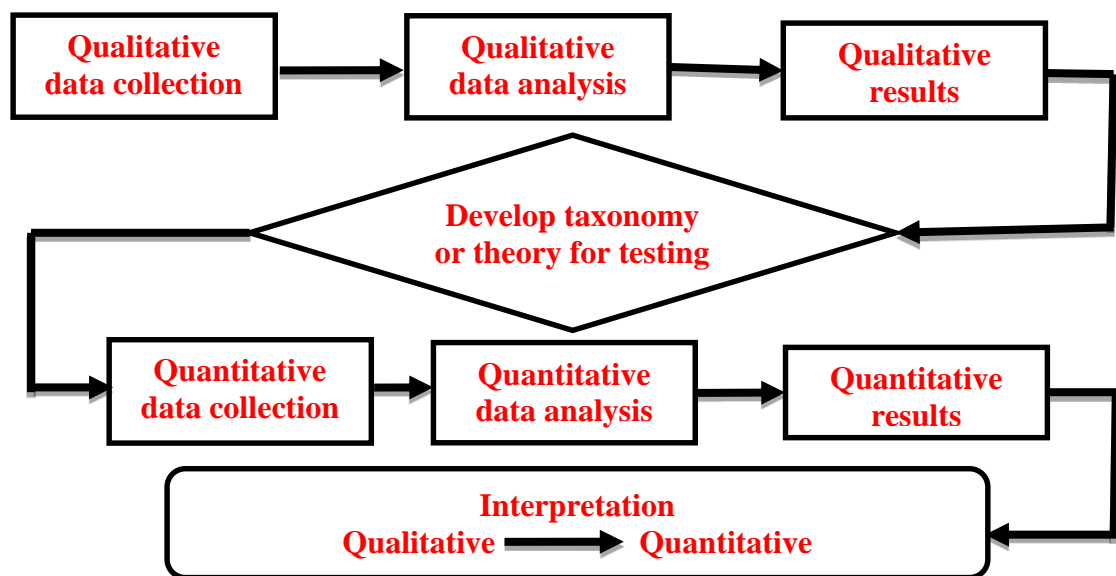
**Table 5. 1 Summary of mixed methods design types (adapted from Creswell and Clark, 2011)**

Therefore, to achieve the research objectives and remain in line with the four principles, the current research is appropriate with a design in which (1) there is an interaction between qualitative and quantitative data, (2) the priority of the qualitative phase is to explore the admin-avatar dimensions and its consequences, (3) the sequential approach that the quantitative phase is based on is the qualitative phase, and (4) the qualitative and quantitative components are mixed in the data collection. Therefore, the exploratory sequential design is the most appropriate design for the current research. This design will help in achieving the research objectives. The first strand (qualitative) will achieve the first three objectives; introduce the admin-avatar and its characteristics, illustrate its dimensions and explore the attitudinal and behavioural consequences of the users. The second strand (quantitative) will achieve the fourth research objective, which empirically examine the influence of the admin-avatar dimensions on the attitudinal and behavioural consequences of the users. Myers and Oetzel, (2003) adopted this design to explore the dimensions of organisational assimilation creating and validating its measure.

### **5.5 Exploratory sequential design**

The exploratory sequential design is useful when qualitative research can be used first to best determine and identify variables and constructs of the taxonomy, then examine them empirically (Creswell & Clark, 2007). The exploratory sequential design includes two variants: the theory-development variant and instrument-development variant. In the theory-development variant, the priority of the initial qualitative phase is placed on the succeeding quantitative phase playing an inferior role to expand on the initial results. The qualitative component is conducted to develop an emergent theory or a taxonomy, then the qualitative findings are tested with a larger sample. This model is appropriate when the quantitative research questions or hypotheses are formulated based on qualitative findings, and the researcher continues to conduct the quantitative phase to answer the research questions (Creswell & Clark, 2007, 2011). Contrary to the previous model, an instrument-

development variant could be chosen. In this model, the initial qualitative phase plays an inferior role whose purpose in gathering information is to build a quantitative instrument (Creswell & Clark, 2007, 2011). The current research adopted the first model because the main aim of the research is to explore the admin-avatar concept displaying its dimensions, conditions and consequences. Therefore, this model helps define a taxonomy that shows all of them. Figure 5.3 shows the different stages of this design. The constructs and taxonomy are first generated qualitatively, and then the relationships between these constructs are tested quantitatively.

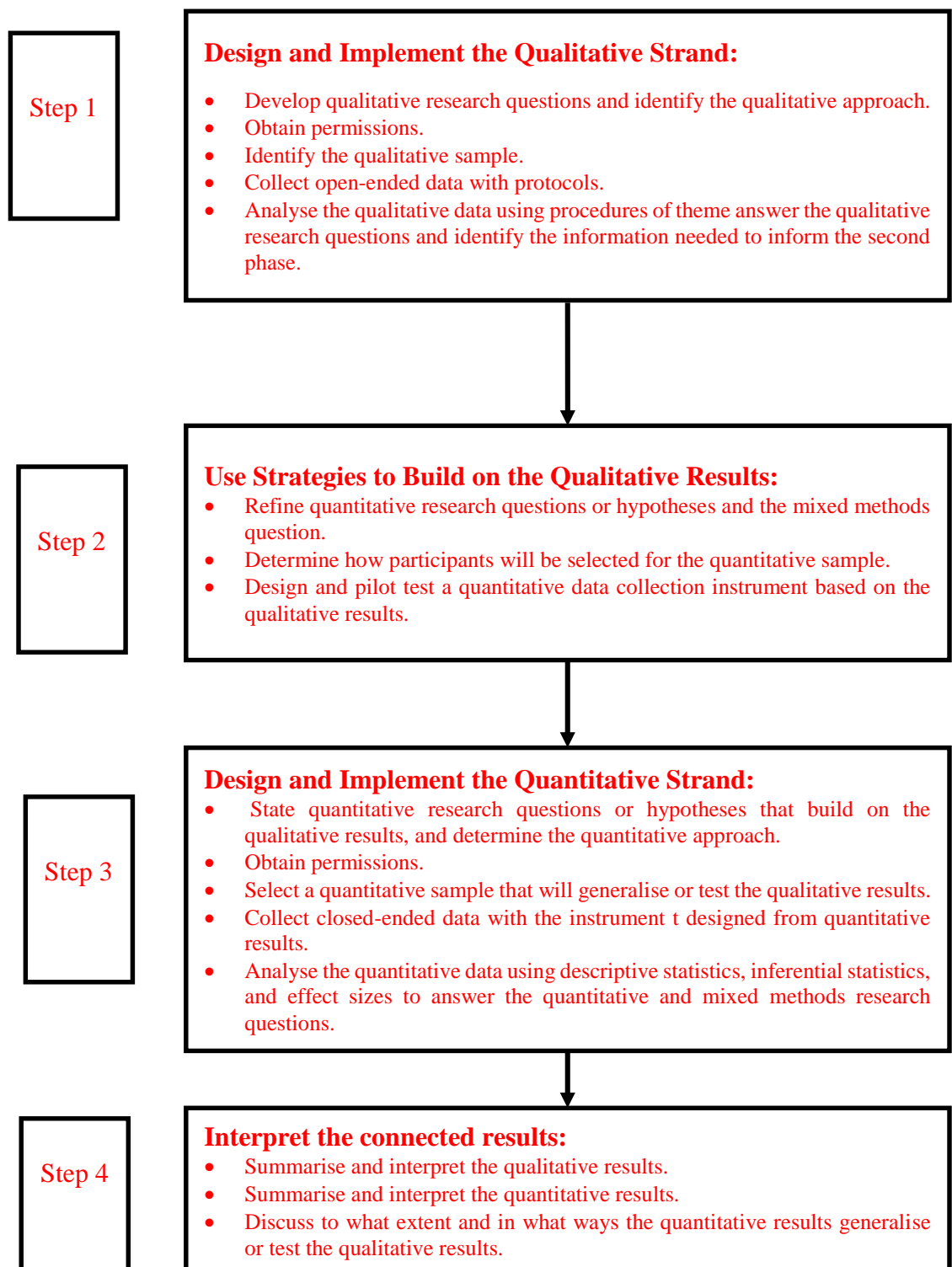


**Figure 5. 3 Exploratory design: taxonomy development model (QUAL emphasised)**

The exploratory design has advantages and challenges. The main strengths of this design are (1) the straightforward approach of the design to describe, implement and report due to the separate phases of the design, (2) inclusion of the quantitative approach can make the qualitative results more acceptable to quantitative biased audiences, and (3) it easily applies multiphase studies in addition to single research. However, the main challenges of this design are that (1) it requires considerable time to implement, (2) decisions must be taken concerning the relevant qualitative findings to use, and (3) we should discuss participants' issues to determine whether the same individuals will participate in both qualitative and



quantitative phases (Creswell & Clark, 2007, 2011). Figure 5.4 shows the exploratory sequential design procedures.



**Figure 5. 4 Exploratory sequential design procedures flowchart (Creswell and Clark, 2011)**

### 5.5.1 First phase (Qualitative phase)

A number of decisions concerning the methodological process in the qualitative phase should be taken in order to identify the required techniques and procedures achieving the research objectives, as shown in Table 5.2.

Methods consideration	Decision	Rationale
Methods selection	Interviews: Exploratory interviews Semi structured in-depth interviews	Interviews yield a large amount of data to explore the concept (Hesse-Biber & Leavy, 2006; Leary, 2004). To explore the guidelines of the admin-avatar dimensions, conditions and consequences. To provide insights of the main themes and constructs that emerged from the exploratory interviews (Spiggle, 1994).
Sampling	Non-probability samples-purposive sampling.	Selecting specific features of the participants will enable detailed exploration and understanding of the central themes and core of concept (Ritchie, 2003)
Data analysis	Analysed in accordance with the framework produced by Spiggle (1994)	To capture holistic views on the use of a concept under investigation (Kauppinen-Räsänen, & Grönroos, 2015).

**Table 5. 2 Exploratory research methodological Process**

#### 5.5.1.1 Method selection: interviews

Interviews yield a large amount of data to explore the concept (i.e., the admin-avatar concept) and generate its taxonomy (Hesse-Biber & Leavy, 2006). In the semi-structured interviews used, the questions were designed to elicit the descriptions of the admin-avatar in order to develop an appropriate definition of this concept. Some questions were designed to elicit the main dimensions of the admin-avatar, which might have an influence on the feelings and attitudes of the participants towards the admin-avatar, website and brand. In addition, other questions sought to identify the participants' behaviours towards brand. Specifically, two types of interviews were conducted: exploratory interviews and in-depth interviews. The questions of each type are shown in Appendix E.1 Questions in the exploratory interview were broader to elicit an outline of the admin-avatar dimensions and

its consequences. The exploratory interviews were conducted between March and May 2013. The in-depth questions were narrow to focus on and get deep insights about each admin-avatar dimension, condition and consequence, as shown in Appendix E.2. In line with Kvale and Brinkmann's (2009) guidelines, the interview protocols were developed. Table 5.3 shows a summary of the interview protocols in different stages of the interview and the action that should be taken.

Interview stage	Actions should be taken
<p>The first few minutes of an interview are decisive.</p> <p>The interviewees want to understand before they allow themselves to talk freely and expose their experiences and feelings to stranger.</p>	<ul style="list-style-type: none"> <li>• Good contact (e.g. attentive listening, showing interest, understanding, respect for what the subject says and ease &amp; clear about what the respondent wants to know).</li> <li>• Inform about the purpose of the interview.</li> <li>• Use a sound recorder.</li> <li>• Ask if the participant have any questions before starting the interview.</li> <li>• Further information can preferably wait until the interview is over.</li> </ul>
<p>The core questions of the interview.</p>	
<p>The debriefing is likely to continue after the sound recorder has been turned off.</p> <ul style="list-style-type: none"> <li>• Some interviewees may bring up topics they did not feel comfortable raising with the sound recorder on.</li> <li>• If new and interesting topics come up after the sound recorder has been turned off, the interviewer should consider if and how this material can be used in the further analysis.</li> </ul>	<p>From an ethical point of view, the interviewer ought to ask the interviewee for permission to report the topics that emerge in the informal conversation after the interview.</p>
<p>After this the interaction can be concluded</p>	<p>The interviewer can say e.g. I have no further questions, is there anything else you would like to bring up or ask about before we finish the interview?</p>
<p>At the end of an interview,</p> <p>There may be some anxiety as the participant has been open about personal and emotional experiences.</p> <p>There may also be feelings of emptiness (no value added; give much information &amp; no have received anything in return).</p>	<p>By asking if the participant has anything more to say.</p> <p>By asking him/her about him/her experiences of the interview.</p>

**Table 5. 3 Summary of the interview protocols**

### 5.5.1.2 Exploratory and in-depth interviews' sampling considerations

In line with Creswell and Clark (2011), the current research follows the recommended qualitative data collection procedures as shown in Table 5.4. In total, 42 interviews (30 participants participated in the exploratory interviews and 12 participants participated in the in-depth interviews) were conducted with current students at the University of Hull. A total of 12 interviews were conducted during the in-depth stage based on findings in preceding research, particularly mixed method research (e.g., Hölscher & Strube, 2000). According to Ritchie (2003), qualitative research utilises non-probability samples; the units are deliberately selected to reflect particular features within the sampled population. These features allow for a detailed exploration and understanding of the central themes the researcher wishes to study. The adopted approach to the purposive sampling to achieve the study's aims and coverage was heterogeneous samples, where a deliberate strategy was used to include the key themes of the admin-avatar concept, as these might vary widely from one participant to another (Patton, 2002; Ritchie, 2003). Applying this approach, the sample was chosen purposively as the participants came from different faculties and departments. In addition, the participants came from different countries. Appendix D.3 shows the classification of the sample based on specific characteristics —namely, nationality, scientific degrees (undergraduate and postgraduate), faculties and/or department.

Procedures in data collection	Persuasive qualitative data collection procedures
<b>Using sampling procedures</b>	Identify the site(s) to be studied. Identify the participants for the study. Note the sample size. Identify the purposeful sampling strategy to enrol participants and why it was chosen (inclusion criteria). Discuss recruitment strategies for participants.
<b>Obtaining permissions</b>	Discuss permission needed to study the sites and participants. Obtain institutional review board approvals.
<b>Collecting information</b>	Discuss the types of data to be collected (open-ended interviews, open-ended observations, documents audio-visual materials). Indicate the extent of data collection. State the interview questions to be asked.

<b>Recording the data</b>	State what protocols will be used (interview protocols, observational protocols). Identify recording methods (e.g., audio recordings, field notes).
<b>Administering the procedures</b>	Identify anticipated data collection issues (e.g., ethical, logistical)

**Table 5. 4 Recommended qualitative data collection procedures for designing mixed methods studies (Creswell and Clark, 2011)**

**Obtaining permissions.** Before starting the interviews, ethical approval was gained from the research ethics committee at the University of Hull. The ethical approval form is included in Appendix D.1.

**Collecting information.** The qualitative data were collected using open-ended interviews to glean deep insights about the admin-avatar concept. All the questions used are shown in Appendix E.

**Recording the data.** In most qualitative research traditions, it is strongly preferable to have a full record of each interview (King & Horrocks, 2010). As the most common form of recording, the researcher utilised an audio recorder to record the full interviews.

**Administering the procedures.** All interviews were one-on-one and face-to-face interviews conducted at the University of Hull. As the admin-avatar concept is new, a hypothetical scenario was developed in which the participants saw a current website with an avatar. The scenario showed how the avatar works. The participants answered interview questions while imagining that the admin-avatar was being used on the university website. The interviews were conducted in line with the interview protocols discussed earlier. The in-depth interviews were conducted in April 2014.

### 5.5.1.3 Exploratory interviews data analysis.

According to Spiggle's (1994) framework, the qualitative data analysis is comprised of seven analytical operations: categorisation, abstraction, comparison, dimensionalisation, integration, iteration and refutation. It is difficult to do these operations separately. At the end of these operations, the meaning of the data is extracted, arriving at conclusions and

generating or confirming conceptual schemes and theories that describe the data. First, the purpose of the categorisation operation is to classify or label units of data. The classification allows moving beyond the identification of themes or unrelated constructs. Related to this operation, five main themes emerged — namely, key dimensions of the admin-avatar, attitudinal consequences related to website, attitudinal consequences related to brand, behavioural constructs resulting from using the admin-avatar and conditions related to the admin-avatar and users (See appendix E3). Second, the abstraction operation aims to develop higher-order conceptual constructs by incorporating more concrete categories and recognising that a unit of data is an empirical indicator of a more general construct of interest. Following that, dimensionalisation involves identifying properties of categories and constructs. ‘Once a category has been defined, the analyst may explore its attributes or characteristics along continua or dimensions’ (Spiggle, 1994, p. 494). An important role of identifying properties and their dimensions is to permit exploring and defining relationships across categories and constructs. Based on the abstraction and dimensionalisation operations, the items of themes are categorised into constructs; some of them are first-order constructs while others are higher-order constructs. For example, the construct of attitude towards the website is considered a second-order construct as it includes three constructs — namely, attractiveness, novelty and likeability —each of which includes a number of items or data units.

The comparison operation aims to explore differences and similarities across incidents in the collected data and provides guidelines for collecting additional data. Comparisons are used to connect between one category and another in the development of abstract constructs. In addition, the comparison operation also guides subsequent data collection in which categories, constructs, and conceptual connections from the initial analysis are identified. Similar to experimental and survey designs, the comparison operation allows for manipulating similarities and differences in consequences. Actually, the comparison

operations are done after dimensionalisation and all units of data are again reread to observe the similarities and differences of items (data units) under the same construct or dimension. Slight changes resulted from this operation. As a lack of information with respect to some constructs and dimensions, such as effort (dimension of ease of use), was observed, further in-depth interviews to get more information which may be significant for this research were warranted.

Integration operation entails the mapping of relationships between constructs in some forms, such as gestalt connections, circular connections or causal linkages. One important issue is that the deliberate use of images may improve this operation.

The sixth operation is called iteration, which refers to the process of repeating. It implies that the researcher does not perform precise research stages in a consecutive manner, but moves back and forth between stages. In this operation, analysing the initial interviews may indicate that additional data should be collected in subsequent interviews or from specific types of individuals. In addition, iteration is based on the data record (interview) or the entire data set (whole interviews). In the former iteration type, the final interpretation of a particular passage of the text is reserved after having considered the entire text or interview. In the latter iteration, reviewing each interview is done after developing the global themes. During the iteration operation, it is important to read and reread the interviews. Iteration allows the development of constructs and conceptual connections for subsequent exploration.

The final operation is refutation. It involves intentionally subjecting one's emerging inferences, such as categories, constructs, or conceptual framework, to empirical scrutiny. Consumer research includes three specific and common techniques of refutation: negative case analysis, purposive sampling, and testing by context. A negative case in the exploratory interviews stage was again invited to do an in-depth interview. There are no agreed-upon

strategies for conducting a negative case analysis, such as how to search for negative cases or use those that appear as exceptions to the emerging analysis (e.g., Glaser & Strauss, 1967, as cited in Spiggle, 1994). The categories that were not confirmed were dropped. Using other contexts or other units of organisation as a basis for refuting was not adopted because of time and cost constraints of the research. Table 5.5 summarises the qualitative data analysis operations.

Operation	Meaning
<b>Categorisation</b>	classifying or labelling units of data
<b>Abstraction</b>	Developing higher-order conceptual constructs by incorporating more concrete categories and recognising that a unit of data is empirical indicator of a more general construct of interest.
<b>Comparison</b>	Exploring differences and similarities across incidents data currently collected and providing guidelines for collecting additional data.
<b>Dimensionalisation</b>	Identifying the properties of categories and constructs. After defining the category, attributes or characteristics along dimensions are explored.
<b>Integration</b>	Mapping of relationships between constructs
<b>Iteration</b>	Moving through data collection and analysis in such a way that former operations shape succeeding ones.
<b>Refutation</b>	Involving deliberately subjecting one's emerging inferences to empirical scrutiny.

**Table 5. 5 Qualitative data analysis operations (adapted from Spiggle, 1994)**

### 5.5.2 Second phase (Quantitative phase)

A number of decisions concerning the methodological process in the quantitative phase should be taken in order to identify the required techniques and procedures for achieving the research objectives, as shown in Table 5.6.

<b>Methods selection</b>	Conduct a number of experiments.	As the admin-avatar concept is a relatively new concept to students and given there are different conditions of admin-avatar that emerged from the in-depth interviews, the experimental design is the most appropriate approach to manipulate these conditions to understand their impacts and controlling of the extraneous variables, which influence the results (Field & Hole, 2010; Kantowitz et al., 2009)
<b>Sampling</b>	Use a convenient sample from the current students at	The most common type used in the experimental design studies (particularly the laboratory experiments) in the literature (Kam, Wilking & Zechmeister, 2007). Choosing existing university students are based on two main reasons:



	the University of Hull.	The experience: good experience to talk about their current opinion and their experience before joining the University of Hull Representativeness: different program, different department and school different stages in the program and different countries.
<b>Context</b>	Use the university as the applied context in this research.	The influence of an avatar increases, in cases of, difficult purchase process, complicated product, and the limited buyer's knowledge of the product (Holzwarth, et al, 2006). Thus, applying this research on university brand would be valuable because the process of comparing between the universities to choose the most appropriate institution is not easy. Therefore, the admin- avatar would likely play an important roles in students' decision making process.

**Table 5. 6 Quantitative research methodological process**

#### 5.5.2.1 Method selection: Experiments

Quantitative data can be collected using different quantitative approaches. Researchers usually relate and/or experiment. Relational research determines how two or more variables are related to each other (Kantowitz, Roediger, & Elmes, 2009) but does not comprise a manipulation of variables, so the data that are related are called *ex post facto* data — that is, ‘after the fact’ (Christensen, 2007; Kantowitz et al., 2009). Thus, related data come from logically occurring events and do not result from direct manipulation by the scholar (Kantowitz et al., 2009). Researchers observe what naturally goes on in the world without directly interfering with it or allowing causal statements to be made (Field & Hole, 2010). However, relational research is not appropriate for some research because it does not control the extraneous variation (Kantowitz et al., 2009). In other words, relational research measures the correlational relationships between, for example, the independent and dependent variables without taking the impact of the extraneous variables into consideration. In contrast, the main advantages of experimental research, compared to survey research, are the direct manipulation of variables and controlling of the extraneous variables, which influence the results (Field & Hole, 2010; Kantowitz et al., 2009). Experiments seek to isolate the cause and effect by manipulating the projected causal variable (Field & Hole, 2010). The experimental research is most appropriate for conducting

the second phase of the current research because the admin-avatar conditions should be manipulated to show their influences on the dependent variables.

Reliability and validity concepts are important to the experiments. Table 5.7 shows the definitions of these terms. Experimental reliability refers to stability, consistency, or repeatability of the experimental study results (Christensen, 2007). Internal validity has been achieved if the observed effect, as measured by the dependent variable, is caused only by the difference in the manipulated variable (e.g., Christensen, 2007; Sawyer, Worthing, & Sendak, 1979). Experimental designs are the only research design in which causal inferences can be achieved with a high degree of certainty (Sawyer et al., 1979). However, if the effects are caused by variables other than the manipulated variable, the extraneous variables confound the results of the experiment, threatening the internal validity (Christensen, 2007). The random assignment of participants to the experimental conditions and the enclosure of proper control groups are critical for achieving high internal validity (Sawyer et al., 1979). Furthermore, external validity indicates the extent to which the experimental results can be generalised across differences in people, settings, treatments, outcomes, and times (Christensen, 2007). To some extent, the internal validity and external validity of experiments are contrariwise related; lower internal validity leads to higher external validity, and vice versa (Leary, 2004). For example, laboratory experiments have high internal validity but suffer from low external validity because of their artificiality. However, the assumption that results of laboratory experiments are not generalisable to the real world environment is not essentially true because the differences between a laboratory and field experiment may be adequately small and the results can be replicated in the field (Sawyer et al., 1979).

Term	Meaning
<b>Experimental reliability</b>	The consistency, stability, or repeatability of the results of an experimental study (Christensen, 2007).
<b>Experimental validity</b>	The accuracy or truthfulness of an inference that is made from the experiment results (Christensen, 2007).
<b>Internal validity</b>	The extent to which accurately inferring that the manipulated and dependent variables are causally related (Christensen, 2007).
<b>External validity</b>	The extent to which the results of the experiment can be generalised across differences in people, settings, treatments, outcomes, and times (Christensen, 2007).
<b>Content validity</b>	The items in the questionnaire must relate to the construct being measured (Field & Hole, 2010).

**Table 5. 7 Summary of experimental reliability and validity**

#### 5.5.2.2 *Types of the experimental designs*

**Experimental research settings.** The experimental approach is often used in laboratory, field, or internet settings. The three experimentations use the experimental approach, but they have slightly different characteristics. According to Christensen (2007), a field experiment is conducted in a real-life setting in which the experimenter actively manipulates variables and carefully controls the effect of as many extraneous variables as the situation will permit. The laboratory experiment is conducted in the laboratory; the researcher precisely manipulates one or more variables and controls the influence of all or nearly all of the extraneous variables. Finally, the internet experiment is conducted over the internet. It has the same characteristics as either a field or laboratory experiment in that the researcher precisely manipulates one or more variables and controls for as many extraneous variables as possible. The current research adopts the laboratory setting because nearly all the extraneous variables should be controlled, particularly, the current research aims to wholly control the independent variables (Field & Hole, 2010).

**Quasi-experiments versus full (true) experiments.** It is valuable to differentiate between two main experimental methods to identify the appropriate ones for the current research. A quasi-experimental design uses experimental designs that do not meet all the requirements essential for controlling the influence of extraneous variables, where it is not possible to randomly assign participants to treatment conditions (Christensen, 2007; Harries, 2010).

Quasi-experimental designs are stimulating and useful methods of attempting to conduct experiments in real-world settings (Harries, 2010). Making a causal interpretation from a quasi-experiment necessitates meeting the same main requirements required for any causal relationships, such as cause must co-vary with the effect, cause must precede effect, and competing hypotheses must be implausible (Christensen, 2007). The quasi-experiments could meet the first two requirements. However, the last requirement is difficult to achieve using the quasi-experiment because it cannot control the extraneous variables. Therefore, it is recommended that true experiments, instead of quasi-experiments, be used, particularly when the aim of the research is to wholly control the independent variables (Field & Hole, 2010). The current research adopted the true experiments to prevent the results from any extraneous variables influencing the admin-avatar.

**Within-subjects versus between-groups designs.** Another decision that should be made is how to assign the participants to the different levels of the manipulated variables. There are two main possibilities: assigning only some participants to each level (between-groups designs) or assigning each participant to every level (within-subjects designs) (Kantowitz et al., 2009). The between-groups (at least two groups) design is conservative. There is no chance that one treatment will continue to contaminate the other because each participant is exposed to only one treatment or tested once only (e.g., Field & Hole, 2010; Kantowitz et al., 2009). However, one of the main drawbacks is that the between-groups design must deal with differences among participants, which decreases its efficiency or its ability to detect real differences between the different treatments (Harries, 2010; Kantowitz et al., 2009). The experimenter must try to minimise differences among the participants in the two or more treatment groups. Techniques can be used to minimise the differences, such as baseline (by administering a test for the treatment to obtain a baseline measure of the subjects), matching (by matching participants' characteristics between groups) and randomisation (by making an equal chance of being the participant assigned to any groups) (Kantowitz et al.,

2009). The use of randomisation is an important factor in conducting the experiment (Field & Hole, 2010).

In contrast, many researchers prefer a within-subjects design (also called a repeated measures design) because it is more efficient as the participants are compared with themselves (Kantowitz et al., 2009). However, the main drawbacks of the within-subjects design are the general practice effects and differential carryover effects (Field & Hole, 2010; Kantowitz et al., 2009). Such effects occur when the participants begin the first treatment; they might become more proficient or they might experience some boredom or fatigue with the task. The later effects occur when the influence of the early part of the experiment on the later part of the experiment varies according to which treatment comes first (Kantowitz et al., 2009). The technique used to diminish, but not eliminate, these effects is called counterbalancing. Counterbalancing refers to the changing of the treatment order between the subjects. In addition to counterbalancing, using the between-groups design or building a sufficient time delay between treatments could help reduce these effects (Kantowitz et al., 2009). According to Field and Hole (2010), each design of the within-subjects and between-groups designs has its strengths and weaknesses. Determining which design is most appropriate to use depends on what is being researched. Table 5.8 summarises the advantages and disadvantages of each design.

	Within-subjects	Between-groups
<b>Advantages</b>	Economy (Cheaper than between-groups)	Simplicity
	Sensitivity (one group and same participants)	Less chance of practice and fatigue effect. Useful when it is impossible for an individual to participate in all experimental conditions.
<b>Disadvantages</b>	‘Carry-over’ effects from one condition to another.	Expense in terms of time, effort and participant numbers.
	The need for conditions to be reversible.	Insensitivity to experimental manipulations (different participants characteristics in the groups might affect the results).

**Table 5. 8 Summary of advantages and disadvantages of within-subjects and between-groups designs**

As each type of designs has its own advantages and disadvantages, a within-subjects (repeated measures) design was adopted for the first experimental study because it is cheaper, given the limited amount of available resources for the current research. Moreover, using within-subjects design for the second experimental study is more risky because the participants will be exposed to four conditions. Thus, the probability of experiencing participant fatigue in the second experimental study is high. This may negatively influence the later conditions of the experiment that the participants exposed to; additionally, using different languages in the second study makes it very difficult to use a within-subjects design. Given these constraints, a between- groups design was deemed to be more appropriate for in the second experimental study.

### 5.5.2.3 Quantitative data collection issues

In line with Creswell and Clark's (2011) procedures, considerations for the quantitative data collection issues were followed, as shown in Table 5.9.

Procedures in data collection	Persuasive qualitative data collection procedures
<b>Using sampling procedures</b>	Identify site(s) to be studied. Identify participants for the study. Note the sample size, the way it was determined, how it provides sufficient power. Identify whether probabilistic or non-probabilistic sampling strategy. Discuss recruitment strategies for participants.
<b>Obtaining permissions</b>	Discuss permissions needed for study the sites and participants. Obtain institutional review board approvals.
<b>Collecting information</b>	Discuss the types of data to be collected (instruments, observations, quantifiable records). Discuss reported scores for validity and reliability for instruments used.
<b>Recording the data</b>	State what instruments or checklists will be used and provide examples.
<b>Administering the procedures</b>	State how procedures will be standardised. Identify anticipated ethical issues.

**Table 5. 9 Recommended quantitative data collection procedures for designing mixed methods studies (Creswell and Clark, 2011)**

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**Sample characteristics and sample size.** Population is defined as the entire collection of individuals being considered, such as all students at State University or all college sophomores (McBurney & White, 2009). The population of this research is all UK university students (undergraduate and postgraduate). The sample is a small subset of the population that is used to make inferences about the population as a whole (Field, 2005). The appropriate sample for this research is a convenience sample. It is quite an acceptable type which selects a desirable group of people. In addition, most experimental research is done using convenience sampling (McBurney & White, 2004). For both experimental studies, the first participants who were invited and agreed to attend participated in the experiment sessions. The invitation was extended by meeting students while they were on the university campus and convincing them to participate. The researcher provided the students with brief information about the experiments, such as the aim of experiment and the location of the experiment (computer room on the campus). After the students agreed to participate in the experiment, the researcher collected their email addresses to send them an email detailing the available sessions. Most students (experiment participants) booked their places before coming to the experiment sessions.

To determine the sample size, three approaches can be used: power analysis, confidence interval and computer-intensive methods. Power analysis seems the best method for determining the appropriate sample to use for study (Christensen, 2007). As one of the main limitations of using convenience sampling is non-representative population and bias, a power analysis is used in an attempt to reduce some of its limits (Bailey, 2009). According to power analyses, sample size can be calculated before data collection (*a priori*) and after data collection (*a posteriori*) in which power is 'the probability of rejecting the null when a particular alternative hypothesis is true' (Dattalo, 2008, p. 15). Power is defined, in the case of *a priori*, as  $1 - \beta$   $\alpha$ , where  $\beta$  is a type II error. Several authors suggest a 4:1 ratio of

$\beta$  to  $\alpha$  (type I error), suggesting that the recommended alpha level is 0.05 (Christensen, 2007; Dattalo, 2008). Therefore,  $Power = 1 - 4(0.05) = 0.8$ .

Concerning effect size, which refers to the magnitude of the real effect of the independent variable on the dependent variable (Pagano, 2013) or the true alternative hypothesis such as an expected difference between groups (Dattalo, 2008), the common standard of effect size established by Cohen (1988) is shown in Table 5.10.

Effect size (d) value	0.00-0.20	0.21- 0.79	$\geq 0.8$
<b>Interpretation of d</b>	Small effect	Medium effect	Large effect

**Table 5. 10 Cohen's standard (cited in Pagano, 2013)**

Based on Cohen's table (power tables for effect size), the sample size alternatives at power level 0.8 are shown in Table 5.11. As the dependent variables (constructs) emerged from the qualitative phase, the probability of the real effect of the admin-avatar on these constructs could fall with a mid-level range. Therefore, the effect size taken in this research is 0.5, meaning the sample size (N) is 28 participants. Thus, for the first experimental study, at least 28 participants should participate (within group). For the second experimental study, the required total sample size is 112 participants for the four groups (between groups).

Power	Effect size								
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<b>0.8</b>	<b>783</b>	<b>194</b>	<b>85</b>	<b>46</b>	<b>28</b>	<b>18</b>	<b>12</b>	<b>9</b>	<b>6</b>

**Table 5. 11 Sample size alternatives (Christensen, 2007)**

**Obtaining permissions:** Ethical approval (see the appendix) and informant consent for this study were obtained from the Ethics Committee of the Hull University Business School, University of Hull (see Appendix D). The experiments were conducted in a computer room (lab) at the University of Hull between 20 April 2015 and 10 May 2015.

#### 5.5.2.4 Experiments' measurements

**Experiment study one:** Based on a comprehensive review of the literature and the qualitative phase, a 93-item survey instrument was created (Appendix G.1). This survey



measured eight items for clarity (based on Freling, Crosno, & Henard, 2011 and the qualitative phase), six items for control (developed from the qualitative results), four items for communication (Holm, 2006), five items for convenience (adopted from Keh & Pang, 2010, and Seiders, Voss, Grewal, & Godfrey, 2005), five items for assistance (developed from the qualitative results), five items for competence (adopted from Aaker, Vohs, & Mogilner, 2010) five items for hedonism (adopted from Voss, Spangenberg, & Grohmann, 2003), four items for information recall (based on the qualitative results), three items for website ease of use (adopted from Adjei, Noble, & Noble, 2010), three items for usefulness (adopted from Sheinin, Varki, & Ashley, 2011), 17 items for attitude towards the website (adopted from Altsech, 1996; Freling et al., 2011; Ganesh, Reynolds, Lockett, & Pomirleanu, 2010; Holzwarth et al., 2006; Koslow, Sasser, & Riordan, 2003), three items for pride (adopted from Eyal & Fishbach, 2009; Wilcox, Kramer, & Sen, 2011), 18 items for attitude towards brand (developed from the qualitative results), four items for the potential to join (developed from the qualitative results) and three items for propensity to leave (adopted from Fournier, Tanner, Chonko, & Manolis, 2010).

**Experiment study two:** Based on the comprehensive review of the literature and the qualitative phase, a 101-item survey instrument was created (Appendix G.2). This survey measured eight items for clarity (based on Freling et al., 2011, and the qualitative phase), six items for control (developed from the qualitative results), four items for anthropomorphism (Bartnecket al., 2009; Kim & McGill, 2011), five items for convenience (adopted from Keh & Pang, 2010, and Seiders et al., 2005), three items for familiarity (adopted from Zhou et al., 2010), five items for hedonism (adopted from Voss et al., 2003), four items for information recall (based on the qualitative results), three items for website ease of use (adopted from Adjei et al., 2010) three items for usefulness (adopted from Sheinin et al., 2011), 17 items for attitude towards the website (adopted from Altsech, 1996; Freling et al., 2011; Ganesh et al., 2010; Holzwarth et al., 2006; Koslow et al., 2003), eight

items for social presence (adopted from Short, Williams, & Christie, 1976; Swan et al., 2008), 18 items for attitude towards brand (developed from the qualitative results), four items for feedback (developed from the qualitative results), three items for word of mouth (adopted from McGregor, 2006; Reichheld, 2003; Zeithaml, Berry, & Parasuraman, 1996, as cited in Brügger, Foubert, & Gremler, 2011) and five items for recommendation (Cheema & Kaikati, 2010; Gelbrich, 2011).

**Pre-test and revise the questionnaire.** The questionnaires for both experimental studies were tested on a sample of participants (10 current students at the University of Hull) to identify, uncover and remove potential problems, particularly question content, wording, difficulty, layout, instructions and time scale (e.g., Harries, 2010; Malhotra, 2004). For both questionnaires, participants were very close in estimating the required time as their estimations ranged between 13 and 16 minutes for the first study and 18 to 22 minutes for the second study. This was good indicator that the expected time was 20 minutes per condition for first experiment and 20 minutes for the second experiment study. Some spelling mistakes were recognised by the participants and corrected. With respect to the items/sentences which have common parts, some participants recommended using the common part as the title of the question while leaving the remaining parts in the table. This helped shorten the items' sentences and save participants' time, as shown in Table 5.12.

Before	After
<ul style="list-style-type: none"> <li>• If I were a student at University of Gloucester, I feel that the university of Gloucester is adapting new ways</li> <li>• If I were a student at University of Gloucester, I feel that the University of Gloucester is helpful.</li> <li>• If I were a student at University of Gloucester, I feel that the University of Gloucester is advanced.</li> <li>• If I were a student at University of Gloucester, I feel that the university of Gloucester if friendly.</li> <li>• If I were a student at University of Gloucester, I feel that the university of Gloucester is very good university.</li> </ul>	<p>If I were a student at University of Gloucester, I feel that the university of Gloucester is:</p> <ul style="list-style-type: none"> <li>• Adapting new ways</li> <li>• Helpful.</li> <li>• Advanced.</li> <li>• Friendly.</li> <li>• A very good university.</li> </ul>

**Table 5. 12 An example of reducing the sentence length**

### 5.5.2.5 Quantitative data Analysis

This section presents the quantitative data analysis techniques used in the current study. One of the essential initial steps before dividing the data analysis, particularly multivariate data analysis, was data examination or screening data prior to analysis (Hair et al., 2010; Tabachnick & Fidell, 2013). Although this step takes many days in order to make a careful examination of data prior to running the main analysis, which took about 5 minutes, it was considered fundamental for the honest analysis of the data (Tabachnick & Fidell, 2013). According to Tabachnick and Fidell (2013), data screening affects the accuracy of the data file, missing data, outliers and test of normality, as discussed as below. Table 5.13 shows the meaning of each data screening type.

Data screening type	Meaning
<b>Accuracy of data file</b>	Ways to achieve the accuracy of the computerised a data file.
<b>Missing data</b>	The items or questions, which have been omitted from a response.
<b>Detection of outliers</b>	Cases that have an extreme element or value on one variable (a univariate outlier) or such an uncommon combination of scores on two or more variables (multivariate outlier) that, is unusual, it misrepresents descriptive statistics.
<b>Test of normality</b>	Each variable and all linear combinations of the variables are normally distributed, thus, the residuals of analysis are also normally distributed and independent.

**Table 5. 13 Data screening types' meaning**

**Accuracy of data file.** The best way to safeguard the accuracy of a data file is to proofread the original data against the computerised data. The first step with a large data set is to check univariate descriptive statistics using a descriptive programme such as SPSS frequencies. For continuous variables, are all the values within range? Are means and standard deviations reasonable? For discrete variables (such as categories of gender and age), are there any out-of-range numbers? Have the codes for missing values been accurately programmed? (Tabachnick & Fidell, 2013).

**Missing data.** Missing data are one of the most universal problems in data analysis. The seriousness of missing data depends on the pattern of missing data, how much is missing,

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and the reason they are missing. In the current experiment, no data were missing because the data were collected using a web-based questionnaire where participants were required to answer all the items on the screen before proceeding to the next page. Therefore, the analysis of the missing values was ignored in this study.

**Outlier.** An outlier is a case that has an extreme element or value on one variable (a univariate outlier) or such an uncommon combination of scores on two or more variables (multivariate outlier) that makes it extraordinary and distorts descriptive statistics (e.g. Fraser, 2012; Tabachnick & Fidell, 2013). Thus, outliers potentially put the analysis at risk of erroneous conclusions (Howitt & Cramer, 2011). Outliers are found in both univariate and multivariate situations, among both discrete and continuous variables, among both independent variables and dependent variables (Tabachnick & Fidell, 2013). An outlier occurs for four reasons. First, it arises from incorrect data entry; in these cases, data should be checked carefully to ensure that they are properly entered. Second, it arises from the failure to specify missing-value codes in computer syntax so that missing-value indicators are read as real data. Third, the outlier is not a member of the population from which the researcher intended to sample. If the case should not have been sampled, it is removed once it is noticed. Fourth, an outlier arises when it is from the intended population, but the distribution for the variable in the population has more extreme values than a normal distribution. There are two main methods to position the univariate outliers: statistical and visual methods. For continuous variables, the univariate outliers are the cases with very large standardised scores (z scores), in excess of  $\pm 3.29$ , on one or more variables. Cases with standardised scores are potential outliers. However, the extremeness of a standardised score relies on the sample size that a few standardised scores in excess of 3.29 are expected with a very large sample (Tabachnick & Fidell, 2013). In addition to z-scores, potential univariate outliers can be noticed through using box plots. Box plots are simpler and literally box in observations around the median; however, cases located far from the box (any scores

that fall outside the inner fences) are extreme and called outliers (Dancey & Reidy, 2007).

In the current study, z-scores and box-plots were used to detect outliers.

**Test of normality.** In the multivariate normality, it is assumed that each variable and all linear combinations of the variables are normally distributed; thus, the residuals of analysis are also normally distributed and independent (Hair et al., 2010). The assumption of multivariate normality was not readily tested because it is unreasonable to test an infinite number of linear combinations of variables for normality (Tabachnick & Fidell, 2013). Although the normality of the variables is not always compulsory for analysis, the explanation is usually quite a bit better if the variables are all normally distributed because the solution is degraded if the variables are not normally distributed (Tabachnick & Fidell, 2013). It is common to assess the normality of variables by either statistical or graphical methods through two main components skewness and kurtosis (e.g., Field, 2005; Tabachnick & Fidell, 2013). When a distribution is normal, the values of skewness and kurtosis are zero (Tabachnick & Fidell, 2013). Nonnormal kurtosis produces an underestimate of the variance of a variable (Tabachnick & Fidell, 2013). Although both skewness and kurtosis are usually performed to assess normality, ‘they do not indicate whether the distribution as a whole deviates from a comparable normal distribution’ (Field, 2005, p. 93). Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) deal with these limitations by comparing the scores in the sample to a normally distributed set of scores (Field, 2005, p. 93). In terms of power considerations, Stevens (1992) recommended using both the skewness and kurtosis coefficients to test for both types of normality violations separately together with S-W in a single test (Barnes, 2001).

**Confirmatory factor analysis (CFA).** CFA may also be used. CFA has become an increasingly common method of examining the structure of data sets (Curran, West, & Finch, 1996). CFA requires the researcher to identify both the number of underlying dimensions and the specific pattern of loadings of each of the measured variables on the

underlying set of underlying dimensions (Curran et al., 1996; Janssens et al., 2008). Table 5.14 shows key statistical concepts related to CFA.

Statistical concepts	Meaning
<b>Observed or manifest variables</b>	Variables which are measured effectively (e.g., score on 7-point scale). They are shown as square or rectangular.
<b>Non-observed variables or latent variables</b>	Variables which are measured indirectly, but may be derived/estimated on the basis of the score for and the variance of the observed variables. They are shown as circles or ovals.
<b>Error terms</b>	Determine the unique variance of a variable, which are non-observable and are therefore always indicated with a circle (e1, e2, e3 and e4).
<b>Double-pointed arrows</b>	Used to indicate correlations and co-variances.
<b>Single-pointed arrows</b>	Used to indicate causal effects.
<b>The numbers '1'</b>	Assigning a measurement scale to the latent factors and error terms. This results in unique solutions.

**Table 5. 14 Key statistical concepts related to CFA (adopted from Janssens et al., 2008)**

Initially, each measured variable in the simple form of CFA models is hypothesised to load on only one factor and identify the positive, negative, or orthogonal correlations between the factors. The CFA models set restrictions on the factor loadings, the associations between factors, and the correlations between errors of measurement, which allows for tests of the fit of the hypothesised model to the data (Curran et al., 1996). To conduct the CFA for the current research, the models are created using AMOS software (version 22). In line with Janssens et al.'s (2008) guidelines, a number of steps were followed. After drawing the model(s), some outputs should be checked, such as the minimisation history and test for normality and outliers, standardised estimates, squared multiple correlations, residual moments, and modification indices. These outputs help make decisions with respect to reliable constructs by studying unidimensionality, convergent validity, composite reliability and discriminant validity. Unidimensionality means that a set of variables only has one fundamental dimension in common. The variables measured here must all have loadings

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higher than  $>.50$  on the latent variables and must be significant by achieving a critical ratio (C.R. = t-value) = 1.96. The standardised regression weight should be equal to .50 or more.

The overall fit of the measurement model determines to what extent the covariance matrix generated by the model corresponds to the actual covariance matrix (Janssens et al., 2008). To determine the overall fit or general quality of the measurement model, a number of different criteria are used. The null hypothesis of equal covariance matrices are not allowed to be rejected if  $p > 0.05$  and the chi-square value of degrees of freedom  $< 2$ , indicating that the quality of the model is good — particularly with larger samples. The goodness of fit index (GFI) should preferably be greater than .90, and the adjusted goodness of fit index (AGFI) is preferably greater than .80. In addition, the comparative fit index (CFI) should preferably be greater than .90. Another indicator frequently used is the root mean square error of approximation (RMSEA). It should be less than or equal to .05 to indicate a good fit, and values up to .08 indicate an acceptable fit (Browne & Cudeck, 1993, as cited in Janssens et al., 2008). The modification indices are used to advance the relationships between these variables. These indices are used here to determine which variables must be removed from the model. Items strongly correlated with a latent variable and therefore have a unique variance, should not be included in the analysis. The degree quality of the model is improved after every removal of a variable. Such good fit models can provide strong evidence about the reliability and both convergent and discriminant validity of a set of measured variables (Curran et al., 1996).

**Convergent validity.** Convergent validity represents the degree to which two different indicators of a latent variable confirm one another (Janssens et al., 2008). Two conditions of the convergent validity are weaker and stricter conditions. A weak condition indicates that each of the loadings is significant (all of the cases have C.R.  $> 1.96$ ). A stricter condition indicates that the correlation between each indicator and the corresponding latent variable

is greater than .50, together with a good fit of the model (Janssens et al., 2008). For further details on how to be applied on constructs of the research framework, see sections 8.4 and 9.4.

**Composite reliability.** Opposite of the convergent validity, a criterion for reliability may not be extracted directly from the output. It must be calculated manually for every dimension (Fornell & Larcker, 1981; Janssens et al., 2008) using the following two equations:

$$CR = \frac{(\text{Sum of Standardised Loadings})^2}{\{(\text{Sum of Standardised Loadings})^2 + \text{Sum of Measurement Error}\}}.$$

It should be higher than .70 (Hair, Ringle, & Sarstedt, 2011).

$$\text{Average variance extracted (AVE)} = \frac{\text{Sum of Squared Standardised Loadings}}{\text{Sum of Squared Standardised Loadings} + \text{Sum of Measurement Error}}.$$

Each construct should have a value greater than .50. For further details on how to be applied on constructs of the research framework, see sections 8.4 and 9.4.

**Discriminant validity.** Discriminant validity refers to the relationship of the off-diagonal terms of correlation between two constructs with the average variance extract (AVE). Discriminant validity is achieved when the square of the correlation between these two constructs should be smaller than their corresponding AVE (Fornell & Larcker, 1981). The elements on the diagonal corresponds with the AVE of the constructs whereas the non-diagonal elements are calculated as the square of the correlations between the constructs (Janssens et al., 2008). For further details on how to be applied on constructs of the research framework, see sections 8.4 and 9.4.

**Common method bias (COB).** Common method bias, also called common method variance (CMV), refers to the variance attributable to the measurement method rather than to the constructs the measures reflect, thereby distorting the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The method factors can bias estimates of construct reliability and



validity and/or can bias parameter estimates of the relationship between two different constructs (Podsakoff, MacKenzie, & Podsakoff, 2012). Two main types of remedies can be used to control the method variance: procedural remedies and statistical remedies (Podsakoff et al., 2012; Williams et al., 2010). In line with Mackenzie and Podsakoff's (2012) recommendations, several procedural remedies related to the questionnaire design were undertaken to minimise method variance, as shown in Table 5.15. To assess the severity of common method bias statistically, the comprehensive confirmatory factor analysis marker technique from Williams, Hartman, and Cavazotte (2010) was adapted for the current study. This technique is discussed in detail in Chapters Eight and Nine.

Potential Sources of bias	Actions for improvement
<b>Lack of participant ability (verbal skills, education, or cognitive sophistication)</b>	The two questionnaires were pretested to ensure that the questions are written at a level the participants can understand.
<b>Lack of experience thinking about the topic</b>	Participants were exposed to an admin-avatar before they completed the questionnaire. The purpose of the research, the importance of this survey as a part of a PhD thesis and the importance of their contribution to the research were provided in the front page of the questionnaire.
<b>Complex questions and item ambiguity</b>	Complicated, difficult to understand ambiguous items were eliminated in the pre-test.
<b>Low self-efficacy to provide a correct answer</b>	Highlighting to participants in the instructions that there are no right or wrong answers and that it is important to answer all questions as honestly and accurately as possible.
<b>Grouping related items together.</b>	Questions were purposely randomised for every participants throughout the questionnaire to decrease potentially undesirable response patterns.

**Table 5. 15 Recommended procedural remedies related to the questionnaire design (adopted from Mackenzie & Podsakoff, 2012)**

**Testing hypotheses.** As this research compares the differences between more than two groups or conditions, the appropriate technique is one or more of the analysis of variance (ANOVA) techniques (Coolican, 2009; McBurney & White, 2004). It is a powerful parametric procedure or technique for testing the differences between several averages which avoids the problem of occurring Type 1 errors. This type appears when several *t* tests

are used in multiple comparisons between pairs of averages (Coolican, 2009). To show the differences between the different conditions, the repeated ANOVA is used in the first experimental study and the factorial design ANOVA is used in the second experimental study.

**Repeated ANOVA.** Repeated measures or repeated ANOVA is a term used when the same participants participate in all conditions of an experiment (Field, 2009). For example, the same participants in the first experimental study were exposed to the three conditions (all conditions of this study). A repeated measures structure must be balanced through the observation for each subject and for each experimental condition (Janssens et al., 2008). In other words, if an observation is missing a specific experimental condition for a participant, that participant will be excluded from the analysis.

**Factorial ANOVA design.** The second experimental study adapts a 2x2 factorial design. As this design has two independent variables, the factorial ANOVA design is an appropriate type for showing the differences between groups (Field, 2009). Unlike the repeated measures, participants are exposed to only one experiment condition. This technique is discussed in detail in Chapter Nine.

**Serial multiple mediator model.** Mediation indicates a situation when the relationship between an antecedent and an outcome variable can be explained by their relationship to a mediator as the third variable (Field, 2013). There are two main mediation model types: simple mediation model (included one mediator) and multiple mediator models (included more than one mediator). The latter type is most appropriate to the current experimental studies because the proposed framework includes more than one mediator between the admin-avatar dimensions and their outcomes. The multiple mediator models are divided into two types: the parallel multiple mediator model and the serial multiple model (Hayes, 2013). The former model proposes that all mediators operate in parallel, without influencing

one another. The serial multiple mediation model proposes that mediators are linked together in a causal chain. The latter type is the most appropriate type because the proposed framework postulates that the mediators related to the website influences the mediators related to the brand. Following Hayes's (2013) procedures, the serial multiple mediator model is used to examine the mediation effect in the two experimental studies (see Chapters Eights and Nine).

Although there are some advantages to using structure equation modelling (SEM), for the estimation of the serial multiple mediation model, doing so is neither necessary nor better (Hayes, 2013, p. 159). Hayes found that results using LISREL are extremely similar to those of the serial mediation model. In addition, he believed that there are no advantages to using a SEM programme when conducting a mediation analysis. Unlike the SEM programme, the serial multiple mediation model forces the user to estimate a model it is programmed to estimate rather than the exact model the user might want to estimate. For instance, it will estimate all direct effects in a serial mediation model. However, SEM would allow the researcher to estimate a model that constrains certain direct effects to zero.

**Simple moderator model.** A statistical models sometimes includes the combined effect of two or more predictor variables on an outcome. The combined effect of two variables on an outcome is known theoretically as moderation and statistically as an interaction effect (Field, 2013). In the second experimental study framework, with only one moderator, a simple moderator model was adapted. Following Hayes's (2013) procedures using SPSS, the simple moderator model was used to examine the moderation effect in the second experimental study (see Chapter Nine).

**5.6 Chapter summary**

This chapter outlined the methodological approach undertaken in this research. The first section of the chapter discussed different philosophical paradigms showing the appropriate one for the current research, followed by a discussion of the research design employed. The third section discussed how the exploratory sequential model was conducted. This involved the qualitative and quantitative phases and considered issues such as the chosen methods, sample procedures, data collection procedures, and analysis techniques used for each phase. The next four chapters present the qualitative and quantitative data analysis. Specifically, Chapter Six provides the first part of the qualitative data analysis (admin-avatar dimensions and conditions), Chapter Seven outlines the second part of the qualitative data analysis (consequences of using the admin-avatar, its taxonomy and the framework of the experimental study), Chapter Eight discusses the design and data analysis of the first experimental study, and Chapter Nine discusses the design and data analysis of the second experimental study.

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## **Chapter Six:**

### **Qualitative data analysis and results:**

#### **Admin-avatar definition, characteristics, dimensions and conditions**

##### **6.1 Introduction**

Chapter Five discussed the research methodology, presenting the philosophical paradigms, research designs and procedures and indicating the appropriate ones for the current research. The appropriateness of the qualitative analysis was highlighted in Chapter Five to explore the admin-avatar concept. This appears to be supported by the gap in the literature regarding the lack of study of the admin-avatar concept. This chapter presents what constitutes the term *admin-avatar* from participants' perspective and its main characteristics. It also discusses the primary dimensions of the admin-avatar and key conditions in which the admin-avatar is employed as a tool on the websites. Hence, this chapter addresses two research objectives: (1) defining the admin-avatar concept from the university students' perspective, identifying its main characteristics; and (2) exploring the main dimensions of the admin-avatar and the main conditions related to the admin-avatar and its users (the status of the admin-avatar [e.g., admin-avatar based on text or not] and users familiar with the admin-avatar or not). Figure 6.1 shows the Chapter Six map.

The qualitative data, as described in Chapter Five, were collected from current students at the University of Hull. The participants came from different faculties and departments and different countries, reflecting the diversity of university departments and its students' hometown.

##### **6.2 Admin- avatar definition and characteristics**

As indicated in Chapter Four and based on the extensive review of the literature, there is a lack of understanding of the admin-avatar concept. Thus, this section fills this gap in the extant literature by developing a new definition of the admin-avatar concept.

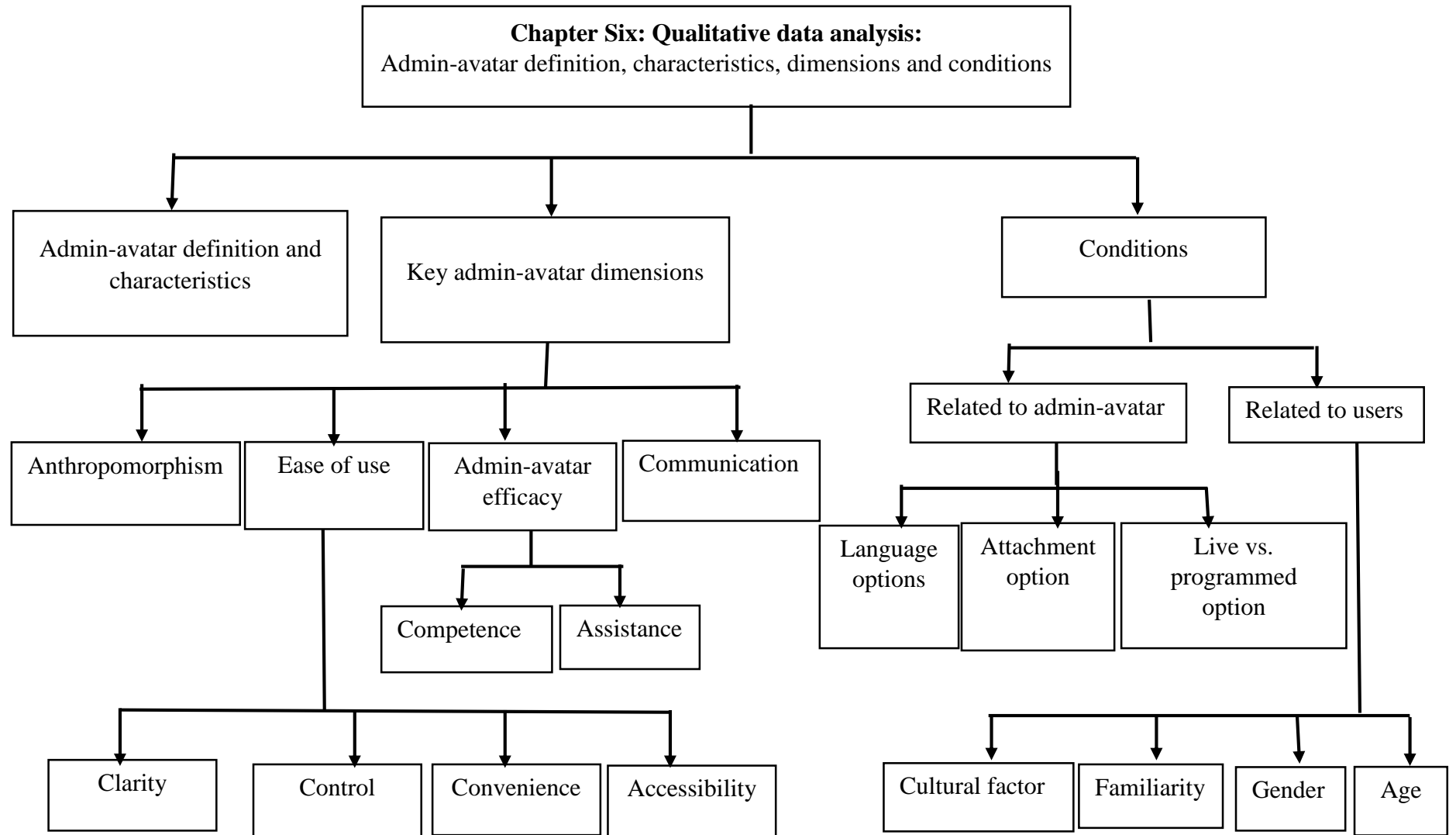


Figure 6. 1 Chapter Six map

In a hypothetical scenario, the participants viewed a website of an existing organisation which has avatar on its website and saw how its avatar was working. They were asked to imagine an avatar on the university website. Participants were also asked to describe it. For example, in his description, Jamaan focused on two main characteristics: the nature and functionality of the admin-avatar. He considered it like a voice over the website (nature) which offers a source of information giving the users all the needed information about the university and its services. Here, the feature (voice) replaced the text by providing information in an oral format. Jamaan also believed that the admin-avatar could organise the provided information in a way to help users receive it effortlessly. In addition, the admin-avatar can act as a university/organisation representative on the website.

*The admin-avatar is one of the features that can give me full information about particular website such as the university or particular services in the website. Therefore, instead of reading and trying to find my information, the admin-avatar can classify their information based on what they provide. Therefore, I think I can easily go to what I want through the website and listen to the presenter of the institution.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

In his description of the same two characteristics, Srin referred to the admin-avatar as an animated graphical interface (nature) providing information (a source of information as a main function) which users may need. The information is displayed in two main formats: audio and video (nature). Srin contended that a significant difference exists between the admin-avatar and real humans because the admin-avatar's shape does not look like a real human, just an animated graphical interface.

*The admin-avatar is a graphical interface; it is not a human being, but some animated graphical interface which gives you relevant information in audio as well as visual format.*

Srin, Male, PhD: Finance, India

Khulood also referred to the two characteristics by describing the admin-avatar as a programme on the website (nature) with some human characteristics, such as talking to give

the information and/or answering the queries the students may have (source of information as a function). She believed that the main aspect of the admin-avatar is to imitate a human being on the website to give users and students the feeling that somebody or some person is interacting with them. This view supports Srin's view that the admin-avatar is considered an attempt at integrating a human touch on the website.

*It is like a programme that has been designed as a person who speaks with me and gives me information about any aspect I am asking about...it is like somebody imitating a human being by talking.*

Khulood, Female, PhD: Accounting, Oman

In her description of the admin-avatar, Élise focused on the anthropomorphism of the admin-avatar by identifying some of the distinguishing human characteristics, such as professionalism, natural expressions and willingness to answer questions. Thus, she also considered the admin-avatar as a source of information.

*She looks very professional. She is talking naturally. Therefore, she is like waiting to listen to my questions; it is really like a real girl.*

Élise, Female, MSc: Financial management, France

Overall, most participants focused on the talking feature, rather than the text, of the admin-avatar, through which it provides information. In addition to the admin-avatar's verbal cues, the nonverbal cues were considered important for some participants and could be embedded, as indicated by Moukhled.

*I think the admin-avatar gives us oral information instead of reading it. Therefore, in some cases sometimes it might be easier for us to listen, not to read.*

Talha, Male, MSc: Business, Oman

*I think it is a good solution and a nice solution for people, especially those who like to visualise something to see something.*

Moukhled, Male, PhD: Supply chain, Saudi Arabia

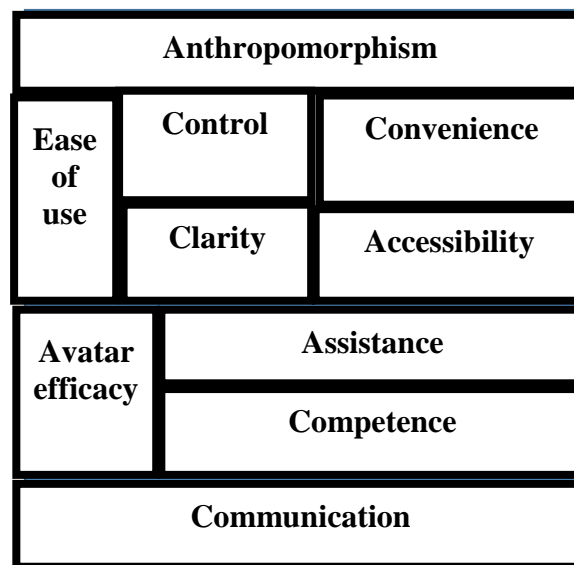


The admin-avatar characteristics can be classified into three main categories: human being, visual, and audible and programming characteristics. The admin-avatar includes some human characteristics, such as speaking, a human face and human parts of the body (e.g., shoulder and arms), expressions, and gender. Visual characteristics include the animated interface (not a static avatar) and graphical and expressional features (e.g., nonverbal cues). In addition, all the provided information is spoken. Thus, the admin-avatar is audible and programmed with specific information.

Based on the previous discussion, the admin-avatar is defined as an animated graphical web interface that imitates the university administrators by providing information and responding to users'/visitors' queries orally and visually. This definition differs from the extant definitions in the literature, as referred to in Chapter Three, on a number of facets. First, it was observed that the majority of definitions address the avatar concept in general. However, this definition addresses the admin-avatar as a specific concept (the avatar representing the administrator of brand). Second, the current definitions focus on the representation as a main aim of the avatar without delineating other functions. Conversely, this definition elucidates the main functions of the admin-avatar. Third, the proposed definition clearly asserts that the admin-avatar is closely similar to the real person demonstrator of the university by imitating his/her cues and behaviour. Finally, the proposed definition includes two main characteristics: the oral and visual format; these are lacking in most definitions reviewed. Although the qualitative data analysis helped in developing a distinct definition of the admin-avatar, two key aspects noted in the literature have not been recognised in participants' narratives: representation and dimensionality (e.g. Brown et al., 2010; Halvorson et al., 2012; Luciano et al., 2001). Therefore, considering these aspects, the admin-avatar could be defined as a three-dimensional animated graphical web interface that represents and imitates the organisation's administrators by providing information and responding to users'/visitors' queries orally and visually.

### 6.3 Key dimensions related to the admin-avatar

The admin-avatar is one of the modalities/media which delivers information to people through websites. It is important to identify the main dimensions related to the admin-avatar that make it a successful tool when performing its tasks. Four main admin-avatar dimensions emerged from participants' narratives: anthropomorphism, ease of use, self-efficacy and communication.



**Figure 6. 2 Admin-avatar dimensions**

#### 6.3.1 Anthropomorphism

Supporting some of previous studies, which examined the degree of avatar anthropomorphism (e.g., Lisetti et al. 2013), the qualitative results of current research show link between the admin-avatar and human characteristics or behaviour appears obvious in participants' descriptions. This link reflects the anthropomorphism dimension. Participants described different facets of this dimension. For example, Srin perceived the admin-avatar as being similar to humans while having a graphic format to provide information orally. He believed that this dimension might enhance the user's acceptance of the website. These results are in line with Jin and Boleburch (2009) who examined the effect of the speaking feature on the users' perception (e.g. avatar attractiveness).

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*The main characteristics like it is a sort of dummy of any living human being and it gives me information that I am looking for in an audio and visual format. So the university is trying to make it as close as possible to be living as a human being and it will make its use much more prominent and maybe people will start accepting it largely... It looks like, but is not, a human being because it is an animated character which has been programmed to deliver us a specific message.*

Srin, Male, PhD: Finance, India

Khulood supported Srin's view that the admin-avatar emulates the real administrator through his/her face and voice and the notion that it can respond to the user's queries. This imitation makes the admin-avatar close to a real one because still there is a degree of it being like a robot. Khulood also believed that the admin-avatar has some emotions, which is a human characteristic.

*It is an imitation personal image of a human being. It is a voice which is a human voice speaking as well. That is a characteristic like a human picture ... who is responding to certain questions that are written on the website. I cannot say it is a human character because I feel like it is just a robot who is imitating a human, but somehow it is like it is close to human but not a real human because I had that view of a robot in my mind, so when see an electronic picture that comes to my mind. It is an interactive intelligent way of communication...[and] has some kind of emotional feelings.*

Khulood, Female, PhD: Accounting, Oman

In addition to the face shape and oral characteristics of the admin-avatar identified by Srin, Arun noted preferring to interact with the admin-avatar on the websites based on some factors, such as the image of the admin-avatar and its gender, voice accent and tone. Arun's account appears to identify three additional human characteristics: namely gender, accent of voice and tone. He noted preferring to interact with a female (versus male) admin-avatar with a British accent. The degree of the admin-avatar tone (e.g., strong versus weak) might also play a vital role in its acceptance. Zul depicted the admin-avatar as being friendly — another human characteristic — when it gives information to the users or visitors.

*It is nice to listen to an admin-avatar, but it depends on many factors such as... the image, gender, voice accent, tone.*

Arun, Male, PhD: Systems studies, India

*The admin-avatar is...friendly...*

Zul, Male, PhD: Marketing, Indonesia

In perceiving how human the admin-avatar is, participants had diverse descriptions. For example, Alyan asserted that the admin-avatar to which they were exposed looks more like a real human than on other websites which include just a picture or cartoon. However, Qadir viewed the admin-avatar used as a more cartoonish character than a human; even its accent was clear and understandable.

*It definitely looks human because it has a human face and speaks to me...but some websites put just cartoons.*

Alyan, Male, MSc: Education, Saudi Arabia

*It is like a cartoonish character sound...it reminds me of a Pokémon character but is an English version.*

Qadir, Male, Bachelor: Accounting, Pakistan

Audery believed that the admin-avatar was more like a human being as it moved its face and eyes. According to her beliefs, the admin-avatar was similar to a lady who does marketing or advertising activities on TV. Delia also referred to the admin-avatar's movement of its face and eyes. Supporting the movement point, Matthew indicated that the admin-avatar moves around, especially when s/he speaks like a real human, not just picture. Talha also viewed the admin-avatar as a moving person who can convince visitors to use the services offered.

*Yes because she moves her face and eyes, she looks like a woman on a TV show.*

Élise, Female, MSc: Financial management, France

*I like the fact that she is moving a little bit and not just static....*

Delia, Female, PhD: Marketing, UK

*Her face moves when she speaks; that is cool.*

Matthew, Male, Bachelor: Biomedical, UK

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*I think having a talking three-dimensional character could convince me to buy the product or service.*

Talha, Male, MSc: Business, Oman

Participants describing the admin-avatar referred to some other human characteristics, such as an attractive professional who represents the university.

*The admin-avatar is attractive.*

Larkai, Male, MSc: Business, Ghana

*She is a pretty girl. She is wearing a suit. She looks professional.*

Qadir, Male, Bachelor: Accounting, Pakistan

*She looks like a professional. She is pretty. She is a girl*

Élise, Female, MSc: Financial management, France

*She looks like a professional person. She would represent the business school well, and she is an attractive woman.... Yeah, she looks really like a business woman. She looks very real.*

Delia, Female, PhD: Marketing, UK

Unlike participants who perceived the positive side, Malik referred to the drawbacks of the admin-avatar. He mentioned that having things such as unusual tone, pace and breaks led to problems in delivering the message in a smooth way. This broke his attention and led him to feel bored. According to this view, this admin-avatar tended to be artificial and was not close to a human being.

*After listening to the admin-avatar description, although the information is valuable, the tone, pace and the often breaks in the message made it boring to listen to and this will in turn distract my attention.*

Malik, Male, Bachelor: Engineering, Nigeria

Participants suggested that it would be better to create avatars of the dean or vice chancellor, for example, to provide some information in order to be more convincing. Talha believed that providing the information in an oral way was better than in the written condition. He compared and linked the two similar cases. Some organisations upload videos of their chief executive officers, which is an attractive way to captivate/attract consumers on websites. Correspondingly, the university could create avatars of the dean to deliver his/her words/information on the webpage in an oral manner. According to Zul, creating an avatar

of the dean would help him receive the information comfortably and produce a good attitude towards the avatar as it would appear like a real person

*I think the spoken language here is much better. I have been in that experience which is somehow similar, but it is not avatar. When I open some websites I see a word from a CEO that is written and normally anybody can read it. I was less interested to read what he said, but another company put a link. I clicked it, and I saw the CEO of that company speaking. In that case it was more interactive and it attracted me to listen more than to read. So I think, yes, if the dean of the school for example somehow sees his face and is trying to see what I normally read now, I think it is better.*

Talha, Male, MSc: Business, Oman

*It should be good looking. It should be good looking. If the admin-avatar is someone who is famous talking about the organisation, that can give information more comfortably for the audience to hear the information from him or her. Especially if the person is a famous person, it makes me comfortable to hear something from him; it looks like the real person is talking to me.*

Zul, Male, PhD: Marketing, Indonesia

Contrary to the previous studies, the current research focused on all the identified human features in more detail to give clear insights into the anthropomorphism dimension. Existing studies declared that the degree of anthropomorphism could reduce the limitations of the system or interface (Luo et al., 2006). Anthropomorphising agents or avatars require adding human-like features, such as facial cues, speech output, body gestures, human emotions and social intelligence (Qiu & Benbasat, 2009). In the next sub section, the ease of use admin-avatar as another key dimension will be discussed.

### **6.3.2 Ease of use**

Many participants cite the ease of use and its aspects as key dimensions for using the admin-avatar as a tool on the university website. In general, students such as Chao, Bora, Moukhled and Shafiq believed that receiving information from the admin-avatar was easy for them. These results are consistent with Takahashi et al., (2005) results. Bora argued that she could do other tasks while listening to the admin-avatar, particularly if it spoke in her native

language. However, Moukhled indicated that it depended on the aim of the search he was doing on the website. In some cases, reading the information is better than listening to it.

*The admin-avatar makes it easier for me to get the information than reading text.*

Chao, Male, PhD: Engineering, China

*I can listen to it while I am doing something else and if it were my native language, it would be much easier.*

Bora, Female, Bachelor: Modern language, Albania

*Listening is easier to receive (get) information than reading.*

Moukhled, Male, PhD: Supply chain, Saudi Arabia

*The admin-avatar gives a new way from a different layer easily.*

Shafiq, Male, PhD: Finance, Ghana

Matthew and Zul did not perceive any difficulty with using the admin-avatar; it was just one click to receive the needed information. Shu did not believe that any additional complicated requirement emerged when adding the admin-avatar which could make it difficult to use. Before adding the admin-avatar, visitors usually read the information. However, after the addition, they listened to it, resulting in the same level of ease when getting the information. Delia and Élise believed that the ease of using the admin-avatar came from picking the needed information up faster than in the text condition. However, Delia was slightly concerned about the ability to design an admin-avatar to provide specific information rather than listening to the entire message the admin-avatar shared to pick up the needed information.

*No, it is not difficult. Just press on it. Speaking is not difficult; it makes it easier.*

Matthew, Male, Bachelor: Biomedical, UK

*I think it is so easy because we just click on the website and then the admin-avatar will speak to us and we will get the information.*

Zul, Male, PhD: Marketing, Indonesia

*I think it is easy. Nothing has changed because before you click and see text answers to questions or explain something. But now, click and the admin-avatar starts talking — no big differences for operating website or system.*

Shu, Female, PhD: Finance, China

*I do not have to read the information, she is just saying it. It is almost conversational. ... Just this slight concern about how easy to find very specific information from her, but makes me wonder, anything else!*

Delia, Female, PhD: Marketing, UK

The language used is considered another important element that determines the degree of ease of use. Alyan believed that international students might face some difficulties in getting the needed information from the admin-avatar, particularly when using difficult vocabulary. Élise and Qadir, as international students, also expected to encounter some difficulties when the admin-avatar speaks too fast. Therefore, the language the admin-avatar uses and its speed play critical roles in determining the degree of ease of use. In addition, Alyan believed that it is important to provide an introduction to demonstrate how the admin-avatar works because it is a new technology introduced on the website. It might make using the admin-avatar easy. Previous research results on similar admin-avatar concepts, with relation to the ease of use, showed that users who were completing a problem-solving task experienced more difficulty communicating through an avatar system than those interacting through full video-conferencing links (Clayes & Anderson, 2007; van der Sluis et al., 2012).

*For international students, sometimes it will be difficult for them to understand difficult new vocabulary; there should be an introduction on how we can use this tool.*

Alyan, Male, MSc: Education, Saudi Arabia

*For me as student, as an international student, it just that may be I cannot understand if she speaks too fast for me.*

Élise, Female, MSc: Financial management, France

*This should be some problems for some students, like if English is not the first language. Like this lady, she is speaking really fast, I might understand it, but it might be a communication barrier for other students where English is not their first language.*

Qadir, Male, Bachelor: Accounting, Pakistan

Mehedi believed that the admin-avatar could help people, particularly visually impaired individuals, receive the information in an easy way. Mehedi also expected people who do not like to sit in the front of the screen to prefer to use the admin-avatar as an easy tool.

*By listening to the voice of the admin-avatar, it is especially important for disabled people — those who cannot see, those who cannot read — because they cannot read the texts. So, they can listen to one voice, and it*



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*will be helpful for any disabled PhD students as well. I have two points — mainly, one is the implication for the disabled people and the second is for normal people as well as those do not like to look at the screen for a long period of time.*

Mehedi, Male, PhD: Management, Bangladesh

Four main issues were raised in the interview data, and many relate to or reflect the ease of use issue. These include control, clarity, convenience and accessibility.

### 6.3.2.1 Control

The control issue in the admin-avatar condition was critical for many participants, who argued that it is difficult to accomplish their tasks or receive complete information when having control problems. For Dara, although written information is better because she can control the text by returning to any part to review it, it takes more time compared to the admin-avatar case. Samuel believed that replacing the information from texts on the website to audio through the admin-avatar is a problem because users cannot control the process of getting the needed information, as in the reading condition, but the difference between both conditions is not significant.

*With text modality, it is easier to read and read again, and I observed that I am able to control my reading pace and likewise filter what I want to know about. While with the admin-avatar, it is slightly different.*

Samuel, Male, PhD: Media, Nigeria

*When I read the text, it showed the overall context that I can go back to review it again and again, but this method will take more time than listening to the admin-avatar.*

Dara, Female, PhD: Supply chain, Thailand

Akwei indicated that it is difficult in the admin-avatar condition to make any decisions or search for any unclear words to understand the speech compared to reading a text. In addition, Ahmad viewed that being forced to listen to the whole message delivered by the admin-avatar and listening to it again to understand the unclear part made it difficult. In contrast to reading a text or watching a video, Arun believed that there is no chance to pause and resume the admin-avatar in the case of any destruction. Ralf believed that he could

control the speed of his reading; if he encounters some difficult vocabulary, he can read slowly and/or review the text to understand it. However, he cannot do this with the admin-avatar and has to listen to the message again.

*The differences I see from admin-avatar and a text modality is, with the text, I can read it and make any judgments at any time and can check for any words that are not very clear.*

Akwei, Male, MSc: Business, Ghana

*If I am reading and I do not happen to understand some of the points, I can always re-read the part that I did not understand. However, with the admin-avatar, I am forced to hear all of the information again in order to get to the part I did not understand.*

Ahmad, Male, Bachelor: English literature, Brunei

*In listening, there is no possibility of breaking and resuming. If there is a short break from listening by virtue of any distraction, one has to listen all over again. While reading, it is possible to resume from the paused point.*

Arun, Male, PhD: Systems studies, India

*It could be if I have a text that could be in mistake, so I can read it at the speed I want, but here I cannot because the voice is telling me something. If I did not get the point of the information, I cannot go back or I have to hear the whole information again.*

Ralf, Male, Bachelor: Management, Germany

Another control problem raised by participants related to the lack of text. Malik believed that not seeing the information makes controlling the needed information difficult to students. Similarly, Khulood believed that she cannot control some of the difficult words to know the exact meaning. This difficulty results from not seeing the words as in the text case. This problem can be solved by adding the written information beside the admin-avatar.

*I believe it is difficult because I would prefer to see the text and read it myself at my own pace, and it will help me better imagine and re-read it. I want to be sure of something.*

Malik, Male, Bachelor: Engineering, Nigeria

*When I am reading something and I catch a word I do not understand, I go for a dictionary and look up the meaning whereas if I hear sometimes I am not sure what I have heard and maybe spell it wrong and that means I will not fully understand it. ... It is still difficult as if I can repeat it and hear it and then type it, yes I am trying to look for the meaning of that*

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*word. There is a chance to misspell the word itself. If there is a transcript at the same time that the person is speaking I might click on the word and then tell me what that word means.*

Khulood, Female, PhD: Accounting, Oman

Some participants in the interviews referred to a number of suggestions. For example, Cong advised that, in designing the admin-avatar, 'speed control' should be taken into consideration as a feature. Matthew advised adding some buttons, such as play, pause and scroll buttons, to control the content of the admin-avatar's message. Talha supported Cong's and Matthew's suggestions, which would be beneficial especially for people who are non-native English speakers.

*Advise them to add a function to control the speed.*

Cong, Male, PhD: Supply chain, China

*Maybe if it could have a play and pause button or something like that so if I listen to the whole sentence and maybe if I turn to understand. If it is a long sentence, I even did not understand the middle of it, if this person plays again to listen to it, like maybe scroll and go to the track section to listen it again, it is compatible.*

Matthew, Male, Bachelor: Biomedical, UK

*When I read, for example, especially for those people who are not English speakers, if the avatar is English maybe they cannot go back or they need to click again to listen to the same answer or something like that. So, in this case, reading is much easier, but here we cannot control the flow of information unless there is a sort of speed button that I could reduce or increase the speed of the voice.*

Talha, Male, MSc: Business, Oman

The literature, in Chapter Four, did not include any results with relation to the control issues of avatars or a similar concepts.

### 6.3.2.2 Clarity

A great number of students interviewed in this study indicated clarity was one of the key issues determining the ease of use of the admin-avatar. Hong believed that the admin-avatar is a clear medium for receiving the needed information he searched for. Matthew focused on the clarity of the voice. He perceived the admin-avatar's voice to be clear enough to

understand the content of its messages. In addition, Qadir believed that the admin-avatar was a clear tool for providing information as some individuals cannot read properly. The admin-avatar might help them understand the information. However, Shu could listen to the admin-avatar again to get the required information. Therefore, in her opinion, the addition of the admin-avatar would not represent any problem in understanding the information with respect to the voice's clarity.

*The information listened through the admin-avatar is clear for grabbing the key information I want.*

Hong, Male, Bachelor: Accounting, China

*The admin-avatar has a clear voice...I think it is really clear to understand, it is a nice voice.*

Matthew, Male, Bachelor: Biomedical, UK

*It more clear because if some people cannot read properly, they might understand by listening it.*

Qadir, Male, Bachelor: Accounting, Pakistan

*If information is transformed into voice, maybe I can — if I could not understand the question clearly — maybe I can listen to it one more time.*

Shu, Female, PhD: Finance, China

With respect to the clarity of language used, Bora believed that the pronunciation was occasionally not clear, particularly for international students. Akwei considered the presence of only one accent of the admin-avatar which might not be clear for every student to understand the provided information. It is better to add an option to the admin-avatar that allows for different common accents to fulfil high levels of the admin-avatar's clarity. For Olivia, the accent used in the admin-avatar is an important point; she preferred to listen to it with a local accent, the common accent in Hull city. Furthermore, Ralf also believed that transforming the information into the audio format made it difficult for him as an international student, especially if the voice was not smooth. This is because it is hard to follow up on the provided information. Talha recommended that the clarity of the accent

used as well as the admin-avatar's face and body language should be taken into consideration when designing the admin-avatar.

*Pronunciation sometimes is not so clear for international students, like me, and if I read a word, it is easier for me to have a clear concept of the information*

Bora, Female, Bachelor: Modern language, Albania

*It would be best for me to have the avatar have a British accent — specifically, a Hull accent.*

Olivia, Female, PhD: Systems studies, USA

*Some accents with the admin-avatar may not be clear for everyone... Not all accents are clear to everyone; some people find it difficult to understand the pronunciation of some words when they say it orally.*

Akwei, Male, MSc: Business, Ghana

*I mean those people who are working on this should be concerned about clarity concerns and about the accent, maybe also the faces and looking at the body language.*

Talha, Male, MSc: Business, Oman

*It was quite clear, but it stopped at some points in the middle of a sentence and then continued after like two seconds or something like that. I got most points, but for me English is not my mother tongue so it is really quite hard to follow them if the sentence breaks down. It was clear what I think is a good point when I read it as fast as the pronunciation. It is me because I am not a native speaker. I do not know the pronunciation of some words.*

Ralf, Male, Bachelor: Management, Germany

For Jamaan, the admin-avatar is clear, but he believed that organising information is critical for making the admin-avatar clear on the website. In other words, the information provided through the admin-avatar should be organised with clear titles and subtitles to ensure using it effectively. Similarly, Köhler et al., (2011) showed that a newcomer's adjustment (e.g., role clarity) is affected by the agent–consumer interaction in terms of content (functional content and social content).

*I think it is clear, but I cannot say that all avatars are clear because it depends on the man who organises or makes category for these avatars. I think that if we make it well organised for the students, it will make*

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*students happier and it is easy to use not complicated [features], such as dividing it into undergraduate, postgraduate and PhD or even by colleges or schools. That will be, I think, a good idea. So the main thing is focusing on how to organise this tool.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

Previous research showed that virtual agent type (two-dimensional embodied agents vs three-dimensional embodied agents) -as a similar concept to the admin-avatar- had highly significant effects on the clarity of the agent's voice (McBreen & Jack, 2001). In the next sub section, the third aspect of the ease of use dimension (convenience) will be discussed.

### 6.3.2.3 Convenience

Convenience indicates the level of effort and time required for the user to use the admin-avatar to get the needed information from the website. Generally, participants highlighted the convenience of the admin-avatar compared to other modalities or styles, such as text, audios and videos. For instance, Talha compared the admin-avatar to the text condition and believed that the admin-avatar was more convenient than the text.

*It is more convenient to listen than to read so the admin-avatar is much better than reading texts.*

Talha, Male, MSc: Business, Oman

The exerted effort in getting the needed information could indicate the admin-avatar's ease of use. Srin believed that getting the needed information through the admin-avatar requires less effort than reading the information from the text. Similarly, Joseph concluded that the admin-avatar provided the information through listening, which did not require reading the information. In line with this view, the preceding research showed that the user interfaces positively differed in relation to search effort in the avatar's presence (Lee & Chung, 2005). In contrast, Khulood believed that using an admin-avatar involves substantive effort, as she sometimes needed to listen more than once and write the difficult words, then search to get the meaning of these words. These actions require more effort, which can be reduced by

attaching a transcript to the admin-avatar. The interviewees shared significantly opposite views regarding the required effort to get the information from the admin-avatar.

*Listening is totally comparatively less effort than reading.*

Srin, Male, PhD: Finance, India

*It does not require reading, but just listening.*

Joseph, Male, PhD: Systems studies, Nigeria

*It is still difficult as if I can repeat it and hear it and then type it, yes I am trying to look for the meaning of that word. There is chance to misspell the word itself. If there is a transcript at the same time that the person is speaking I might click on the word and then tell me what that word means... It is like a replacement for a solution instead of looking for the meaning.*

Khulood, Female, PhD: Accounting, Oman

A great number of participants asserted that the convenience of the admin-avatar comes from saving students time. For example, Tauseef, Biming, Cong and Akmal argued that hearing information from the admin-avatar saved more time than getting the information by reading the text. Bora usually gets information by reading it on the website, but she expected that the admin-avatar would save her time.

*It saves time as information is being spoken.*

Tauseef, Male, PhD: Finance, Pakistan

*It saves my time and quickly provides useful information, which I need.*

Biming, Male, Bachelor: Business, China

*The avatar is a good method for saving the space of the website and time of the users.*

Cong, Male, PhD: Supply chain, China

*It is more convenient to listen rather than reading. It saves time.*

Akmal, Male, Bachelor: Law, Malaysia

*I always used to read information I needed, but an avatar could be better at saving time.*

Bora, Female, Bachelor: Modern language, Albania

For Jamaan, the admin-avatar saved time because if he wanted any information he just asked the questions (clicked the hyperlinks of the questions) and it responded to him immediately. Moukhled believed that the admin-avatar, especially when it provides marketing

information, is convenient as it can deliver a great amount of information in a very short time.

*I mean by that, it will not get too long or too much time to get the answers from the website that will be useful.... If I need anything, I just have to go to the website and ask questions about something that I need so it will save time.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

*Often the sound is much more impactful than text, especially regarding quick marketing information, because it takes a very short time for providing a great amount of information.*

Moukhled, Male, PhD: Supply chain, Saudi Arabia

Yet Olivia believed that the admin-avatar reduced the ability to get the information as quickly as reading. Naveed also viewed reading information to be more convenient than hearing it through the admin-avatar, as the latter might require repeating the listening if a difficult accent is used or the presence of anything (e.g., noise) distracts the user's attention.

*I feel a bit trapped because I am unable to skim the information to save time.*

Olivia, Female, PhD: Systems studies, USA

*Reading is always better and convenient. All the content is in front of reader while in listening we need to rewind to comprehend the accent of the speaker and sometimes environmental noises create problems.*

Naveed, Male, PhD: Supply chain, Pakistan

According to some participants, the admin-avatar is considered a healthier tool for getting the required information. For instance, Rahaf believed that the admin-avatar offered a healthy tool for receiving information, as she did not like sitting for a long period of time in front of the screen. Shu also perceived the convenience of the admin-avatar to come from not needing to stay at the screen for a long time. Supporting Rahaf's and Shu's point of view, Zul, Delia and Biming said that the admin-avatar prevented people from overworking their eyes by listening to the information instead of reading it. Therefore, the admin-avatar could help users get the information conveniently while maintaining eye comfort.

*So it offers me a healthy alternative/option. It is better as I do not like reading from screens for a long time.*

Rahaf, Female, PhD: Systems studies, Oman



*I think it is much more convenient because I really do not want to stay at the screen for the whole day, but if I sometimes I can use my ears instead of my eyes, it will be good. If someone reads it out for me, it makes it clearer sometimes than when I read it. I think so.*

Shu, Female, PhD: Finance, China

*It can give more information without making our eyes tired while reading the letter, like before we just see the written text, but here we can hear because I think people prefer to hear rather than read.*

Zul, Male, PhD: Marketing, Indonesia

*Reading is bad for eyesight and it is convenient to know something through listening rather than reading.*

Biming, Male, Bachelor: Business, China

*In my everyday life, I do so much reading and a lot of that reading is on the screen, and I am actually ending up getting quite tired and my eyes get tired. First, the convenience comes from just being able to listen; doing something else or not having to work hard to find information. ... The convenience for me is just that I do not have to read it, it is nice to hear.*

Delia, Female, PhD: Marketing, UK

Other reasons make the admin-avatar more or less convenient for the visitors. For instance, it depends on the visitor's personality. Ralf viewed himself as a lazy. Therefore, he prefers to listen to the information rather than reading it. He said that if he found two options, the admin-avatar and the text, to get the information, he would choose the admin-avatar, but it should work without any problems, especially in loading or its voice. In other words, the admin-avatar should work smoothly.

*It is convenient for me because I am lazy, so I would prefer to click on and hear the information I do not have read. I do not like reading, really like sitting there much. ... So if I have now a text in front of me and this voice is telling me the text, I would listen to the voice. So I think for me it is better to hear somebody because I can do other things. ... I would prefer the voice avatar if it is not, like, having mistakes in loading and the voice is not coming or anything like that. If it is really working, I would prefer hearing information instead of reading.*

Ralf, Male, Bachelor: Management, Germany

Qadir concluded that the admin-avatar could be more convenient for disabled people who cannot read properly and face difficulties getting the required information in traditional ways (e.g., help desk). Talha and Delia believed that the admin-avatar is not convenient due

to its voice. Listing to speaking devices out loud is not permitted in many places on campus, which limits the use of the admin-avatar.

*It is convenient for me...convenient for disabled students who cannot read properly. Or, for example, for me reading is very hard and I prefer someone to talk to me so that will be really convenient on the website.*

Qadir, Male, Bachelor: Accounting, Pakistan

*I think it is a helpful if the computer, for example, has a headset because I cannot use it in silent rooms. I cannot use it in some places because everybody will listen to the voice. You know, if I have a headset, for example, or if I am in private room, let's say, I think it is useable.*

Talha, Male, MSc: Business, Oman

*I like that idea...if I want to read it with her or if I just want to press the mute bottom on my computer. Like pretend I'm on the train. I cannot listen to an avatar because it would disturb people. ... So, I mean there are certain situations I would not be able to listen to her.*

Delia, Female, PhD: Marketing, UK

Khulood expected the admin-avatar to be easy and convenient for most people as they use devices with advanced technology and there will not be any problems when they use it. For her, it would be convenient, and she gave an example of clarifying the role of the admin-avatar as an instructor for her when applying for the PhD programme. It would make the process of applying more convenient.

*It is a very easy tool. I do not think that it will make people uncomfortable at all because now people get to use many devices and technology and they are not in shock yet they are expecting something.*

Khulood, Female, PhD: Accounting, Oman

It was recognised that there was a lack in investigating the convenience of avatar in the literature. The aspect of convenience showed to extent of required time and effort to get the information through the admin-avatar. The next sub section will discuss the last aspect of the ease of use admin-avatar (accessibility).

#### 6.3.2.4 Accessibility

Some participants believed that the admin-avatar medium could deliver information in an accessible way. For example, Larkai found receiving information through the admin-avatar

to be more accessible. Bora argued that the accessibility of information through the admin-avatar could change students' attitudes towards the admin-avatar as a source of providing information. Supporting to view, virtual agents must be accessible in ways that users can obtain information in order to build trust in them (Hertzum et al., 2002).

*Getting the relevant information is more accessible.*

Larkai, Male, MSc: Business, Ghana

*Students at the University of Hull could change their attitudes by having easier access to the information they need.*

Bora, Female, Bachelor: Modern language, Albania

For some participants, the degree of accessing information through the admin-avatar is determined by factors such as the internet speed, the modem type and other technical issues.

*I think the internet and process and all these things are going to work together — and there are many things affecting the process such as the speed of the internet, the sum of modem or all of these technical things.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

*I think even where the internet connection is bad, if I have text it is loaded once there will be no parts with stops when the admin-avatar is talking, even if the internet is bad. Giving it as it should be, it can break down every time and the text comes once and that for me is a weak point.*

Ralf, Male, Bachelor: Management, Germany

The last aspect of the ease of use addressed the accesability of using admin-avatar and getting the information. The next section will discuss the admin-avatar efficacy as a third dimension of the admin-avatar.

### **6.3.3 Admin-avatar efficacy**

This construct exemplifies the admin-avatar's ability to accomplish its tasks. It consists of two main categories: competence and assistance.

#### *6.3.3.1 Competence*

The admin-avatar's competence reflects the level of its avatar proficiency when presenting its tasks — in other words, the extent of providing information to users in an effective and

efficient way. The participants' views on this point varied. For instance, Akmal believed that the admin-avatar gave the information in an effective way, especially in the detailed information, which is usually ignored by users in the written format. Likewise, Chris viewed the admin-avatar tool as providing more information than needed. However, he preferred to find the specific information he was searching for rather than listening to long information.

*It allows us to get full information from the website as compared to reading because when the text on the website is long, people do not tend to read it.*

Akmal, Male, Bachelor: Law, Malaysia

*The admin-avatar tells me more information than I would have looked out for...[I] would prefer to find what I am looking for instead of hearing a long-winded answer.*

Chris, Male, MSc: Business, UK

On the other hand, some participants believed that the admin-avatar was not competent and was an inefficient way to provide the detailed information. For example, Tauseef believed that, when he wants the details, he prefers reading the information instead of hearing it as it is difficult to understand detailed information when listening to the admin-avatar. Srin also viewed the admin-avatar as just being used for delivering overview information rather than details, which can be obtained from other sources, such as videos. Joseph expected other needed tools to be provided with the admin-avatar to deliver the sufficient information to the users. The need for the additional tools depends on the type of information required.

*However, in order to get deep information, one must read through manually; by listening only, not all the information can be understood. The avatar offers all the related information in a single-handed notion.*

Tauseef, Male, PhD: Finance, Pakistan

*Using this kind of tool cannot give very detailed information because the audiences will be interested in having an overview about the staff, okay.... Once this happens, whatever the listener wants from here, they get a feeling about it. Then they get back to the relevant resources to get the detailed information. If the admin- avatar is supplemented with a video, it would give a nice feel.*

Srin, Male, PhD: Finance, India

*There may be a need for a supportive alternative advert depending on the kind of information involved.*

Joseph, Male, PhD: Systems studies, Nigeria

The participants' opinions vary regarding the understanding issue, such as the extent to which the admin-avatar is considered an appropriate tool for enabling visitors to understand the provided information. For example, Samuel detected the admin-avatar to be an easy tool for understanding the information. Hong regarded the admin-avatar as a creative way to understand the provided information. Supporting these views, Alfredo viewed that the voice of the admin-avatar helped him understand the important parts of the information. Finally, Liang believed that listening to the admin-avatar, compared to reading the text, helped clearly understand some important information which could be ignored in the text condition.

*I find the admin-avatar easier to understand information.*

Samuel, Male, PhD: Media, Nigeria

*It is a creative way to understand the information I want.*

Lu, Male, Bachelor: Accounting, China

*Through the admin-avatar I can understand the important parts*

Alfredo, Male, PhD: Marketing, Mexico,

*When I listen to the admin-avatar, some important information — for example, such as the top university in the UK and some teaching and research — is clearly understood. In contrast, I intend to ignore this text information when I am reading.*

Liang, Female, PhD: Marketing, China

On the contrary, a number of other students explicitly expressed the negative side of adding the admin-avatar, particularly as a substitute for the text. For Bora, getting information from the text would be easier to understand than receiving it from the admin-avatar. Khulood did not believe that she could fully understand the needed information about a particular issue received through the admin-avatar, as she is not a native English speaker. Supporting her opinion, Xu imagined that there would be some problems related to the understanding of

the provided information, especially for international people or students. He believed that the presence of the text increased the ability to understand information.

*I think that the text could more understandable because reading is better for me.*

Bora, Female, Bachelor: Modern language, Albania

*I would imagine that it will be difficult to get a response if I am not a native speaker, like if I am not fluent in English enough, so when the person speaks at a high speed, the person who does not really cover the language well might not understand fully what the avatar is saying.*

Khulood, Female, PhD: Accounting, Oman

*The main problem would be like for some students from other countries; they may not understand the entire message, so they may prefer the text to the admin-avatar. So, this is a problem mainly that international students will face. For me, for example if I read something and I do not understand a word, I can just go to Google translate and know the meaning of this word. But this case is difficult to use with the admin-avatar.*

Xu, Male, PhD: Finance, China

Some participants described the admin-avatar as a tool for providing information, but it is not constantly efficient. For example, Ivan believed that adding text to the admin-avatar would be better for users to receive information when they have a listening problem. Similarly, Hamdan expected the admin-avatar not to work perfectly at all times, and he preferred to use another tool to get the needed information.

*In case some listeners face listening problems, it might be better to include both spoken and written styles.*

Ivan, Male, PhD: Finance, Bulgaria

*I think it is not sufficient because if, for example it does not work very well, I need something else to find what I want. So with itself, it will not work. I do not think it is a good idea just with itself. I need something extra to help me in the search for what I want.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

The previous research showed similar construct to competence which is called affordance. For example, there was no significant effect of designed affordances emerged on the use intentions of embodied agents (van Vugt et al., 2006), which contradicted later research showing that designed affordance (the aiding agent compared to the obstructing agent)

significantly affected use intentions, distance and user involvement (van Vugt, Baileson, Hoorn, & Konijn, 2010). As this sub section addressed the competence, the next sub section will address assistance as the second aspect of the admin-avatar efficacy.

### 6.3.3.2 Assistance

This dimension indicates the roles that the admin-avatar can play in helping the users. The data show a number of roles that the admin-avatar can play. For Jamaan, the admin-avatar assisted him in getting the specific information needed from the website instead of reading many paragraphs or a large amount of information. This is because the webpage with the admin-avatar usually has subtitles as hyperlinks, and each subtitle talks about a specific topic. Khulood supported Jamaan's view that one of the main admin-avatar roles is to summarise and give them specific information or an overview of the topic instead of reading unnecessary information. However, she believed that it might be useless, especially when users cannot get or understand some difficult words. Here, the users face some difficulties getting the correct spelling of these words when just hearing them through the admin-avatar. Khulood believed that it would be necessary to provide other means, such as an email address or phone number in addition to the admin-avatar, to avoid giving inappropriate answers or information. Élise also emphasised the need for other means to respond on the users and ensure that they get sufficient information in the end.

*It is helpful in terms of providing lots of information instead of reading so many paragraphs; students can click on the particular information and they can get their needs from the website.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

*The avatars can summarise information because people do not really hear all the information; they will just look for the information they want. Therefore, it is helpful. It is still difficult as if I can repeat it and hear it and then type it, yes I am trying to look for the meaning of that word. There is a chance to misspell the word itself. If there is transcript at the same time that the person is speaking, I might click on the word for it to tell me what that word means. That would be very helpful. ... If the answers do not really fully satisfy the consumers' needs, they have to make that obvious that they care about inquiries. If this avatar did not help me*

*fully get all responses, please go to this email or please call this number for help.*

Khulood, Female, PhD: Accounting, Oman

*She (the admin-avatar) needs to say something like 'I cannot respond to you; if you need some help, you can call this number' or something like that, not just close the door because if I'm looking for information and she answers a lot of things and one moment says no 'I cannot answer', it is like a catastrophe.*

Élise, Female, MSc: Financial management, France

For Hamdan, the admin-avatar helped him get information about to his inquires instead of calling the administrators of the university. In addition, Qadir believed that the admin-avatar made the website clearer. Mehedi believed that the admin-avatar can be a helpful tool, especially for two types of students: disabled students who cannot read or face problems in reading and normal students who do not like looking at the screen for a long time. Previous results mentioned some roles- included the helper roles- as important roles of the avatar concept (McGoldrick et al. (2008).

*It is a face that helps me when I have any question and it helps me get what I want, either for example to call someone or to search for anything.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

*The main characteristics of the admin-avatar are to help me understand the website more easily, making it much clear.*

Qadir, Male, Bachelor: accounting, Pakistan

*The admin-avatar has allowed voice and by listening to the voice, it is especially important for disabled people and those who cannot read because they cannot read the texts...and for normal people as well who do not like to look at the screen for a long period of time.*

Mehedi, Male, PhD: Management, Bangladesh

Although previous research on avatar mentioned its roles, there was no study recognised, which empirically examined the assistant roles of avatar. In addition, previous research has examined avatars' self-efficacy (Lee et al., 2005) and embodied agent affordances (e.g., van Vugt et al., 2006 & 2010). Affordances refer to the possibilities for action that the embodied agent offers to the user (search, help, etc.). It is recognised that the admin-avatar efficacy dimension is more inclusive than the affordances dimension because the former measures



the sufficiency and efficiency of the admin-avatar in addition to the role it fills. Previous studies also examined users' self-efficacy in using the avatars (Lee et al., 2005). However, the current research showed the admin-avatar's self-efficacy. A significant difference exists between these dimensions. The former measures the user's ability to use the avatar, whether to represent him-/herself or organisations; the latter refers to the admin-avatar's ability to do the tasks it should for the users. In the next sub section, communication as the last dimension of the admin-avatar will be discussed.

#### 6.3.4 Communication

This construct refers to the admin-avatar's ability to communicate effectively with users during the search process. According to Srin, adding the admin-avatar to a website made the communication process between the user and the university easier and faster than the current website. Although Qadir believed that the admin-avatar was a good communication tool for native English speakers, he expected it to be a communication barrier to international users trying to understand the information.

*It makes communication faster and easier.... The kind of admin-avatar you are going to use, like a graphical interface...it is ultimately the application of technology to make communication easier.*

Srin, Male, PhD: Finance, India

*This could be some problems for some students, like if English is not the first language — like this lady is speaking really fast, I might understand it but it might be a communication barrier for other students where English is not their first language.*

Qadir, Male, Bachelor: Accounting, Pakistan

The last admin-avatar dimension addressed in the current research was communication. The qualitative results related to communication are consistent with findings in previous studies. For example, Lee et al. (2005), Li et al. (2011), and Schwarz et al. (2012) argued that avatars can improve interpersonal communication with users because they are used as a rich communication medium for enhancing communications to be much like face-to-face communications. In contrast, as some participants expected, the admin-avatar might be a

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barrier, especially for international students; thus, they argued that it should include the text. These results are in line with, for example, findings from Sutcliffe and Alrayes (2012), who found no evidence of avatars being more effective than text for providing good communication, contrary to the media richness theory. Thus, the qualitative phase of this admin-avatar study showed both sides (positive and negative) with regard to the communication dimension.

The message of the admin-avatar is one of the most important subjects related to communication. A great number of participants acknowledged how the messages delivered through the admin-avatar played a significant role. The data related to the message were divided into two main categories: message content and message length.

#### 6.3.4.1 Message content

The content of admin-avatar messages is considerably important and determines whether the visitor uses the admin-avatar or not. Srin believed that the content of the delivered message was more important than the medium conveying the message. However, he distinguished between the two main types of information and the feasibility of delivering each type via the admin-avatar. The first type of information concerns the educational modules and courses programmes that they can deliver via the admin-avatars. The second type of information concerns the university itself, and Srin preferred to hear it from a real human, such as the vice chancellor or the dean, not from a mechanical animated character such as avatars. This is because the impact of the message will not be as strong from the avatars.

*The information is more important than the medium. ... Definitely, like see about as far as the courses are concerned, if it is talking about the modules or something like that, it is okay. But if it is talking about the reputation of the university or the ranking, the vision, this kind of information, I would like to listen from the vice chancellor or dean of the business school, not from a mechanical animated character because it creates an impact if a person with that sort of profile speaks to me. They*

*place an avatar instead of him, maybe gives it the same information, but the impact is different on the audiences.*

Srin, Male, PhD: Finance, India

For Khulood, the messages should be straightforward and discuss specific points or issues. If the admin-avatar delivers detailed information, it would be more like the text condition, and there would be no benefit from adding this option or tool. Carlos supported the same opinion, saying that he preferred to use the admin-avatar if it gave him specific information. Larkai believed that admin-avatar gives direct information to the visitors or users. However, because Cong expected the admin-avatar to give specific information, he was worried about the important information in the text which might be ignored by the admin-avatar. When adding the admin-avatar, it is important to include the important information about the topic. These results are in line with previous studies (e.g., van der Sluis et al., 2012), which indicated that users prefer avatars or mobile agents that use specific linguistic descriptions. Jin and Bolebruch (2009) also found that the message of avatar should be more informative.

*If the answers like exactly what I have in the manuals but in terms like I can hear it, so it is the same purpose. Listen, if the admin-avatar is so long and it contains a lot of information that I will not need, I will just say it is like reading the manuals. But if avatars are straightforward and well written like for example an accommodation, then I know that it is only about accommodation. This one is like, for example, a PhD programme or first-year programme or social life in Hull. So that will be definitely short. If it is short, I will say that it serves the purpose.*

Khulood, Female, PhD: Accounting, Oman

*If the avatar can give me specific information, I would prefer the admin-avatar.*

Carlos, Male, PhD: Management, Mexico

*The admin-avatar presents messages that are more direct.*

Larkai, Male, MSc: Business, Ghana

*However, some important information should be mentioned by text messages.*

Cong, Male, PhD: Supply chain, China

Delia noted that questions in the subtitle formats besides the admin-avatar include specific information which would help her better. In addition to the specific messages, Ahmad advised that these messages should be organised and easy to follow. Chao believed that the admin-avatar tool was a way to follow the messages and main ideas easily.

*I think there are many questions I do not know and have not looked to the content, but if I could click on specific areas which are giving specific information she could tell me that would be nice. However, I do not want to have to hear here everything. ... I can use the control button, either pause or stop or just forward...but if only she can give a small bit information that would be great. I did not need to know that when I just want straight to the right information.*

Delia, Female, PhD: Marketing, UK

*Currently, there are many smart phones and other hand-held devices that could do these tasks. Therefore, if the avatar can answer only specific questions, then I guess it would be fine. However, they should also provide subtitles so that it would be easy to follow.*

Ahmad, Male, Bachelor: English literature, Brunei

*The information from the admin-avatar should be easy to follow the main ideas.*

Chao, Male, PhD: Engineering, China

#### 6.3.4.2 Message length

The interviewees referred to the length of the provided messages or information as an important aspect. Srin viewed the admin-avatar as a tool to provide short information or an overview of the topic, but the details can be offered by the text. He believed that providing detailed information through the admin-avatar would make the listeners feel bored and uncomfortable. Similarly, Alyan advised that the messages provided by the admin-avatar should be short and specific as long ones will make getting information difficult for website visitors. The difficulty here is related to the degree of accelerating the admin-avatar's sound or going back in the long speech of the admin-avatar. In addition, the written information/message should also be included with the admin-avatar. These results are in

line with previous studies (e.g., van der Sluis et al., 2012), which indicated that users prefer avatars or mobile agents that use short linguistic descriptions.

*Once this — whatever the listener gets from here — they get feeling about it. Then they get back to the relevant resources to get the detailed information. I think this kind of tool should not be used to provide very detailed information, just suggest an overview, in a very crisp and timely manner. I think that this kind of tool will work well rather than giving a long speech that it makes it boring or uncomfortable.*

Srin, Male, PhD: Finance, India

*It should be short because, believe me, many students will like her the first minutes and maybe two minutes and then they will stop it because they cannot move to go ahead of the voice or go back, so that will be difficult. The admin-avatar should give short information and I can enter. It will be very important to put a link for specific information for the whole handbook. It is difficult to just hear the voice, but if they put a link to the specific information it will be good. But the whole text for voice and if they can move it or be a quick speaker, it is difficult I think.*

Alyan, Male, MSc: Education, Saudi Arabia

Supporting this view, Khulood believed that the admin-avatar serve the same purpose of the texts by providing information to the users or visitors. However, the admin-avatar should be short, direct, and well organised with subtitles to serve its purpose completely. She preferred the texts or hardcopy manuals when long information was provided. When the users deal with admin-avatar-provided short messages and/or answers, they perceived it as an interesting and helpful tool.

*If the answers are exactly what I have in the manuals, but in terms I can hear it, so it is the same purpose. If the avatar is so long and it contains a lot of information that I will not need, I'll just say it is like reading the manuals. But if the admin-avatars like straightforward, well-written, and little, for example, accommodation, so I know that it is only about accommodation. This one is like for example the PhD programme or first-year programme, so that will definitely be short. If it is short and I will say, it serves the purpose... That will be very helpful and at the same time instead of getting boring, do not let the admin-avatar be so long. I mean cut down the admin-avatar in terms of small questions and small answers. That will be very helpful and it will serve the purpose of that avatar.*

Khulood, Female, PhD: Accounting, Oman

Finally, a number of participants in the current study cited that the admin-avatar being programmed was a major barrier for communication with the brand. They suggested using

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a live admin-avatar which would respond immediately to users. This result supports previous findings revealing that users tended to prefer receiving messages from avatars in a conversational way rather than a monologue (Nishida, 2002).

#### **6.4 Conditions of using the admin-avatar**

The data suggest that seven specific situational factors influence the use of the admin-avatar. These conditions can be categorised into two main groups: conditions related to the admin-avatar and conditions related to the users. The conditions related to the admin-avatar include the availability of language options, a live admin-avatar option, and the admin-avatar with an attachment. The conditions related to the users include the user's familiarity, culture, gender and age.

##### **6.4.1 Condition related to the admin-avatar itself**

###### *6.4.1.1 Availability of language options*

The availability of language options shows the languages (English versus the participant's first language) which the admin-avatar can use to provide information. The participants are grouped into three main categories: English preference, first language preference, and neutral preference groups. The first group includes all participants who prefer to listen the admin-avatar speaking English language. Their preferences are based upon different arguments. For instance, Arun preferred the admin-avatar with English language as he practically considers it his mother tongue. Meanwhile, Tauseef's preference was based on the universality of the English language. This means that most university visitors benefit from it, unlike any other language that few visitors benefit from them. Likewise, Ahmad believed that, although adding other languages to the admin-avatar would be a good option, he preferred the English language as it is the most accessible language for communication.

*I prefer English. It is practically my first language.*

Arun, Male, PhD: Systems studies, India

*I prefer the admin-avatar to be in English language because English is a universal language and more people will benefit from it. If it will use any regional language, the benefit will be subject to any group of people, not a universal audience.*

Tauseef, Male, PhD: Finance, Pakistan

*Personally, I prefer the admin-avatar to speak English because I think it is the most accessible language for communication.*

Ahmad, Male, Bachelor: English literature, Brunei

For Jamaan, the English language is the most preferable because it is the formal language in the university and he is completing his PhD programme in it. Similarly, Khulood viewed English as the formal language at the university; thus, she and other students have to deal with it in the admin-avatar. She believed that attaching the text to the admin-avatar made the process of receiving information easier because listeners could find the difficult words quickly.

*I prefer to listen to English language because the formal language in the UK is English so I think most people want to improve their English language and ... it is hard to translate into other languages because it is hard to translate special terms. So it is useful if they use English language and most students study English language. So there is no difficulty using English as an official language in the admin-avatar.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

*I will really prefer English as it is the language that I work with and study with it. For international students, they have to deal with English of course at the end. As I said, if they have difficulties in terms of hearing the word and not understanding it, it would be helpful if there was the text written at the same time while the avatar is speaking.*

Khulood, Female, PhD: Accounting, Oman

Although Hamdan preferred receiving the information in English, particularly in a British accent, he would be happy and proud if he found his first language, Arabic. In addition, he believed that the presence of the Arabic language in the admin-avatar would attract Arab students to join the university because they would think that many Arab students study there. In addition, Akwei preferred listening to the admin-avatar in English, but he noted concerns about the accent. In addition, he supposed that any potential applicant who wanted to apply to the university already has a good background or level of English language.

*I prefer to receive it in English language but the accent must be, for example, a UK accent. I do not prefer to receive it in my own language for one reason: I am student here at University of Hull in England, so I will use the English language. ... But, I can remember my own country and will show people that the Arabic language is very popular language I will be proud and I will be happy, but I will not use the Arabic language in avatar. Let me talk about other people who come from outside and see this, there is an option for example, like Arabic. They will directly say okay, go to this university because there is an option to speak Arabic and I want when I arrive there to meet some people to speak Arabic.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

*I prefer to listen to the English one but some accents of the admin-avatar may not be clear for everyone.... Not all accents are clear to everyone; some people find it difficult to understand the pronunciations of some words when they say it orally.... It is not better if the avatar speaks in my own language because English language is an internationally accepted language and everyone who intends to study in England needs to have a good background in English language.*

Akwei, Male, MSc: Business, Ghana

The second group of participants preferred the admin-avatar to talk in their own languages for different reasons. For most participants, the issue of understanding information was the main reason for choosing their own language. For example, Joseph thought that receiving information in one's own language would improve users' understanding. Moukhled believed that it is an important option because the English level of most students when first applying to the university is not good enough to understand the detailed information. Therefore, they can turn to their languages.

*It is better sometimes to run an advert in my own language. This improves the understanding of the target audience more than any general language adopted.*

Joseph, Male, PhD: Systems studies, Nigerian

*Yes of course, this is because when the students start their search for universities, their English levels may not be good enough to understand the information, particularly the details.*

Moukhled, Male, PhD: Supply chain, Saudi Arabia

*Yes, avoid the misunderstanding.*

Cong, Male, PhD: Supply chain, China



Ivan believed that providing the user's own language is necessary, especially if textual information is not present. Furthermore, Rahaf believed that adding users' languages made the admin-avatar more attractive. Akeem thought that users' own language would attract his attention, but he still needed the written information.

*It might be better, especially if my listening in English is not good and there is no written text. It will be difficult just to rely on a spoken English avatar.*

Ivan, Male, PhD: Finance, Bulgaria

*Using a multi-language avatar even makes it more attractive, such as Arabic.*

Rahaf, Female, PhD: Systems studies, Oman

*If the avatar offers an advert in my language, I would prefer it because it would attract my attention more and make it more interesting, even though I still need to rely on written text.*

Akeem, Male, MBA, Nigeria

Olivia believed that adding different languages to the admin-avatar would positively enhance the university's reputation. Matthew would be happy if the university used his language as this might motivate him to recommend the website to his friends, who face language difficulties. Zul said he would feel proud of such an option and would recommend it to his friends as the university recognises his language. He would be committed to continue with the university for future studies.

*Having the avatar speak multiple languages will help demonstrate Hull's reputation as an international school.*

Olivia, Female, PhD: Systems studies, USA

*There could be options to change language, which could be useful to foreign students and could also show that university does have huge foreign students. ... I will just be happy about it. If there are foreign students, I will recommend to my friends and say, if you go to the university website, you have other languages as well which makes easier for the foreign students.*

Matthew, Male, Bachelor: Biomedical, UK

*I would feel proud of that because they know my language! I would prefer to choose this university as a place for my study because they know about my language which means they know about my country. I would recommend this university to other persons because I can say, 'yeah you can use because they recognise our language there, you can enrol in this university'.*

Zul, Male, PhD: Marketing, Indonesia

Shu would feel more comfortable listening to information in her first language. She would feel as if she were in her own country which would produce positive attitudes towards the university and motivate her to recommend it to other international students.

*I prefer my own language, that is for sure. That is so great and so consider the university makes me feel like I am at home. I will like university more.... I will recommend it to my friends, younger sister and brothers. University of Hull is very good, it is very kind, it is an international university.*

Shu, Female, PhD: Finance, China

According to Élise, using multiple languages gives an impression that it is an international university which opens its doors and welcomes students from different cultures. Supporting some of the previous points, Ralf would completely choose his own language as it is a faster way to receive and understand the information. Adding this option would make Ralf perceive the university as an international one and he would be happy because of that. However, he would not recommend the university to his friends because of this option because it is not crucial or an important factor to choose specific university. Other important factors should be taken into consideration, such as the educational system (e.g., supervision, teaching) it follows.

*If I find my language and I am looking for information, I am sure I will use French because it is so complicated for me to have the information in English. ... I welcome them to try it. My first feeling is, oh, they are international and they want to say welcome to everybody and maybe after they can speak many languages so they are very strong.*

Élise, Female, MSc: Financial management, France

*Definitely my own language because it is much easier to get information faster. I think it (university) is more international. It is more personal for everybody because if I am here now like I was in Germany and I was looking for — actually it happened, I was looking for the website and I changed to German and read most of information in German language — the same. I would do the same and I would be really happy if there is a voice in German telling me the information. There is nothing, it would not change my point of view. I would not recommend people because I think university is not only about the website. It is really about education and people and these kinds of things show a kind of innovation, but it is not like the university has the level of knowledge, so it is not a reason for changing the website or a reason for recommending other people to join the university.*

Ralf, Male, Bachelor: Management, Germany

The final group includes those participants who do not mind which language is used. For some participants, using a specific language depends on the situation or the type of needed information. For Talha, if the search is about academic information, he prefers using the English language. However, for searches related to administrative information, he prefers his first language. Adding the Arabic language to the admin-avatar would increase his trust and commitment to the university. He explained that integrating his first language with the admin-avatar would leave an impression that this university respects other cultures, which in turn might enhance the probability of joining the university in the first place. He would also expect there to be a great number of Arabs there. Alyan would use the Arabic language if difficult words or topics were encountered, so he liked the idea of adding Arabic language.

*If I am looking for academic contents or courses, something like this, I will use English but for administrative issues, I will use Arabic. If I see Arabic features available that really give me the sort of confidence to choose the university because they do provide a sort of recognition for others, whether Arabic or Chinese. So, yes it increases my commitment as I said before.... First, I will have a strong potential to join the university. Second, I will know that my culture is recognised within this university, so my feelings will be that this university is providing a sort of multicultural environment. That means there are so many Arab people within the university and, for this reason, they are providing this service, so that means I will not be stranger in this community.*

Talha, Male, MSc: Business, Oman

*It depends on the information. Something difficult maybe I prefer Arabic, so it is good to put such an option. I will feel like they understand Arab students very well. When I entered some universities' websites, I saw you could read in Arabic so I believe that very nice and they like to look for students, especially in their language. So I like this idea.*

Alyan, MSc: Education, Saudi Arabia

Generally, Qadir preferred using the admin-avatar in English to enhance his English levels. However, in situations when he cannot understand the provided information, he would prefer listening in his own language. Adding users' own languages produces some positive attitudes towards the university and its website. For example, Qadir believes that it is an international and helpful university with a good reputation of caring for its students. In addition, he would be very thankful if his own language were added and would recommend

it to his friends. Finally, he believes that the success of the admin-avatar depends on two main conditions: offering different languages, particularly Chinese because of the great number of Chinese students there, and providing information in simple English language for easier understanding.

*I am here to learn and I improve my English because English is not my first language and I want to make it much better. But, in some instances, if I do not understand anything from the admin-avatar, anything complicated on the University of Hull website, then in this situation I might turn to my own language.... I think the university is trying to help us in the best possible way they can and make it more convenient for some students where English is not the first language. ... Probably I will say they actually have been supportive, having my own language in the admin-avatar and trying to help me in every possible way, so I will be positive about the university's website and the university's reputation and say they are really taking care of students well. I would be very thankful to the University of Hull as a person. However, I would recommend it to my friends who speak the same language and they have stock in the admin-avatar.*

Qadir, Male, Bachelor: Accounting, Pakistan

Although Delia is a native English speaker, she enjoyed seeing the admin-avatar with different languages. She perceived this as demonstration that it is a world-class university trying to attract the best students from all over the world.

*I would love that. I think this university is going to attract students from around the world. I would enjoy the experience, I would think it gives a better impression because I think this is going to attract the best people, and this university wants to attract the best people from across the world, not just England, not just Yorkshire. This is really a world-class university. It would give me an even better impression to see the opportunity for students from across the world to come. ... Could she speak in different languages? I suppose that it is another language that will be fantastic if she could speak Arabic to potential Arab students and French and Chinese.*

Delia, Female, PhD: Marketing, UK

Although this research showed the importance of providing languages with the admin-avatar, there was no previous study, which examined avatar or the other similar terminology mentioned the condition of language option availability. This could be interpreted that most of these previous studies examined the chat avatar, whereas few studies examined the spoken

avatar. In the next sub section, the live admin-avatar as a second condition related to the admin-avatar in this research will be discussed.

#### 6.4.1.2 Live admin-avatar

A live admin-avatar emerged as a considerable factor that increased the chance of using the admin-avatar as a tool on the websites. Matthew believed that adding the live admin-avatar helps receive the needed information quickly. In addition, it will be a more flexible option that gives accurate answers than the programmed format. Emphasising the quickness of the live admin-avatar, Ralf indicated that it saved his time because it reduced the time required for a search.

*A live admin-avatar would be better because I mean it is better than skimming a set of answers and is better as it is flexible and the programme could change and give different answers, and I think that could be better.*

Matthew, Male, Bachelor: Biomedical, UK

*I think it would be better if it worked for me to put the question in and he understands me. It would be for me better than searching a list for my question. But the thing is, how does it work? Because sometimes I put in a question and I find the question wrong; it is not like a trip, but I think that it is a problem also in failing to receive a question. But receiving information immediately by voice—it would be better.*

Ralf, Male, Bachelor: Management, Germany

Some participants, such as Ralf and Srin, questioned the possibility of having a live admin-avatar that works appropriately (i.e., understanding the question and responding immediately). However, if it worked, Srin believed that this would influence the users' attitudes towards the admin-avatar as a tool on the website, especially in terms of excitement and value. Talha expected that adding a live admin-avatar would need a great effort and experience to do so appropriately. However, he distinguished between two main cases of the live admin-avatar—namely, written and spoken cases. This means that, if the users ask their question using their voices, he would expect the answers to come through a voice as well and vice versa.

*I do not know how it can be done because it is a technological thing. It is not a natural response of human being so I do not know how you do this!*

*But it is obviously much more interesting. It will be definitely be interesting to see it and more valuable.... The only thing is that if I do have a question, okay I can only ask, just listen to it, but it is a completely different thing.*

Srin, Male, PhD: Finance, India

*The university needs a team here because that simulates life in a normal situation. The admin-avatar speaks to someone and he expects an answer immediately, whatever the answer. Technically, I think you need a huge team because it looks like what is called a call centre, so you need a team that can respond to all questions and here also will that question be oral? I mean, when I ask the question, it will be an oral question or it will be a written question. If it is a written question, I am expecting a written answer.*

Talha, Male, MSc: Business, Oman

For Qadir, adding a live admin-avatar would make it a convenient tool and improve his perception of the admin-avatar, particularly with respect to helpfulness and successfulness. For others, such as Alyan, receiving information through the traditional format or through the admin-avatar would not make a difference. However, having a live admin-avatar would make a difference in terms of receiving the required information immediately.

*I have no time to do that, so that live admin-avatar is a great help. I used to go all the way to the help desk even if I am at home. And if I need help I can just click on the live admin-avatar and it tells me, it guides me. But if the admin-avatar was not present, I need to go all the way down, and that takes time, and go on to find a person who would help me out, that is also time consuming for students. It is a great help and should be successful on the University of Hull website. Especially when I was a new student I would always go to the help desk.*

Qadir, Male, Bachelor: Accounting, Pakistan

*I do not think that this will make a big difference for me. The programmed one does not make a big difference because it is fine if I receive the messages or voice. For me, it is similar, I think. But with the live admin-avatar, it will make something new for me to write and hear her voice. It is good; I will feel comfortable about what they say.*

Alyan, Male, MSc: Education, Saudi Arabia

Delia linked the idea of a live admin-avatar and the talking search option in Google. She expressed her admiration for the idea of spoken responses. However, she believed that such spoken responses are not often appropriate because some users prefer to keep a record of the written conversation, which is available with the spoken format.

*My son is seven and when he uses Google he does not even type in the Google search. He uses the microphone ... and if I could have the set of*

*live chats so there is a real person behind that, yeah I like the idea. I like the idea.... The only thing I can think of is that everybody likes to have a record these days. Like Facebook has a record of conversations and information and emails have a record of written conversations. I do not know whether that gives some people a record. I do not know. I don't think I would if I wanted ask question and get a quick answer back.*

Delia, Female, PhD: Marketing, UK

To be concluded, the live admin-avatar is important to be available on the brand website. However, it is consider as challenge for the brands to provide it in their website as it needs an advanced technology. The last condition related to the admin-avatar is the attachment (whether providing only admin-avatar or admin-avatar based on text), will be discussed in the next sub section.

#### 6.4.1.3 Attachment (admin-avatar based on text)

Attaching written information/text to the admin-avatar, as previously discussed, was considered one of the main conditions/factors which might increase the perceived benefits of using the admin-avatar. Some participants emphasised the importance of the presence of written information with the admin-avatar, offering different reasons. For instance, Delia supported the idea of attaching text in situations where it is difficult to use the spoken admin-avatar (e.g., public transportation and silent places).

*I like that idea. I do imagine what would happen if I wanted to read it with her or if I just wanted to press the mute button on my computer. Like pretend I am on the train. I cannot listen to an avatar because it would disturb people. ... So, I mean there are certain situations I would not be able be able to listen to her because it depends on my surroundings. Therefore, if I am at home in the office, fine, I would listen to it, but probably if I am in a PhD room, I would read the text and put her on mute.*

Delia, Female, PhD: Marketing, UK

Matthew explained that it would be difficult to force all users to use only one tool. Therefore, the university should provide alternative tools so users can decide which one to use. Supporting this point of view, Qadir believed that the tool options should be provided so the choice can depend on the user's aim.

*Everyone has different preferences, so I think both could be better (text and admin-avatar).*

Matthew, Male, Bachelor: Biomedical, UK

*In my point of view, it should be optional to keep this admin-avatar on the website or I might cancel if I do not want it and just read the stuff. It totally depends on how I want it because not every person is the same. I will be biased and say I like the admin-avatar and it should be on the website, but it should not only be the reading section. Maybe some people do not like it. Both options should be open which make the website perfect in both senses.*

Qadir, Male, Bachelor: accounting, Pakistan

Participants concluded that attaching written information to the admin-avatar would be critical, especially for international students. Alyan, as an international student, preferred having access to attached text while the admin-avatar is talking as the spoken admin-avatar is helpful for native English speakers. Élise perceived it as a good idea to attach the text to the admin-avatar because international students probably do not fully understand the admin-avatar. For Khulood, the process of listening to the admin-avatar and typing in difficult words to understand its meanings would be onerous and might be inaccurate. Attaching the transcript would help her receive the information efficiently.

*I think for me because I am not an Englishman I prefer to see the text and hear the voice but believe me the British people want the voice only.*

Alyan, MSc: Education, Saudi Arabia

*I think for international students who do not understand so many things, maybe just take the text the two ways. Maybe, but it is a good idea.*

Élise, Female, MSc: Financial management, France

*It is still difficult as if I can repeat it and hear it and then type it, yes I am trying to look for the meaning of that word. There is chance to misspell the word itself. If there is transcript at the same time that person is speaking to I might click on the word to tell me what that word means. That would be very helpful. It is like a replacement for solution instead of looking for the meaning.*

Khulood, Female, PhD: Accounting, Oman

## **6.4.2 Conditions related to users**

### **6.4.2.1 Familiarity**

The user's familiarity with the admin-avatar can play a significant role in enhancing its use as a tool on the website. The majority of the participants in this research were not familiar



with the admin-avatar as a tool for providing information. Shu said that this was the first time she'd seen an admin-avatar on a website and believed it to be a good chance to try and use it. Delia believed that she and her generation are not familiar with this type of tool as they often use the traditional format of websites, such as texts and videos. In contrast, she expected younger students to be familiar with the admin-avatar as they are often more knowledgeable about information technology (IT). From her point of view, familiarity with this tool helps website visitors use the admin-avatar more easily, thereby enhancing information recall.

*It will be good to try and nice but I do not know because I have not seen anything like this on other university websites. But if there are some avatars, I will try.*

Shu, Female, PhD: Finance, China

*Students are much more knowledgeable about IT than me and my generation, so they want to gather information in different ways rather than just traditional website. So you know things like this are great because it appeals to that and it is easier and easier to find information and the way of studying is going to even narrow research on which university to come to. If you make information gathering easy, they will remember this. It will be more memorable as well. It is easy for them so I think it would be even more popular for students because they are more familiar with technology.*

Delia, Female, PhD: Marketing, UK

Hamdan was also not familiar with the admin-avatar tool. However, he believed that it is a novel tool which has a positive impact (e.g., reducing recruiting costs) on the university itself. For Srin, this was the second time for him to see the avatar on the website, which means he is familiar with this type of technology. However, he encountered some difficulties using it, although he said he would take a quick look when he finds an admin-avatar on a website.

*I will say this is a new idea ... I think this a new idea and I have not seen it before in any university.... Some universities might do it; when they do this it will take chances in terms of reducing the costs for employees and it will work anytime, 24 hours. There are disadvantages, as I mentioned. The internet does not work very well. I mean there are a lot of advantages and disadvantages, but the advantages are more than disadvantages.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

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*I hardly use it man. This is only the second time I have ever seen it. Yes, I do come across some websites so some stuff I see. So rather than reading the stuff, I just click on it and just listen to it. Yes, whenever I get a chance, I am taking a glance towards it.*

Srin, Male, PhD: Finance, India

These results fill the gap referred in chapter Four that researchers should examine other moderators, such as familiarity with avatars (Galaxhi & Nah, 2007; Garnier & Poncin, 2013). The next sub section will discuss the cultural factor as second condition related to the user of the admin-avatar.

#### 6.4.2.2 Cultural factor

Some cultural factors emerged in some participants' narratives, which might play a critical role in accepting or using the admin-avatar. For instance, Arun emphasised that using an admin-avatar might be bound to one's culture (e.g., the appearance of the admin-avatar should be appropriate to the user's culture in relation to the appearance). In addition, Jamaan believed that the user's culture plays an important role in some situations in terms of documentation. Some people need documents with respect to their issues or inquiries. He also gave an example of a similar issue (internet banking) to clarify the cultural role of accepting new or advanced technology. As the University of Hull is a multicultural university, he assumed that no agreement exists about using an admin-avatar as a tool for providing information.

*It is nice to listen to an avatar, but that depends on many factors such as the image, gender, voice accent, tone.... However, it must suit the listener culturally.*

Arun, Male, PhD: Systems studies, India

*I think we still need to use another tool because maybe some students do not deal with that kind of tool because it is new. For example, they think that we have to get a hard copy which is more official than verbal so sometimes they need a document or something like that depending on their culture. For example, in internet banking, I know some people do not deal with internet banking. They go normally to a bank and deposit their money there or withdraw money because they do not always deal with digital information. They think that this information is very secure and they*

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*prefer to go by themselves. So I think because at Hull we have multiple cultures, we cannot say all people can use the avatar.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

The previous studies showed, regarding users' regional differences, that a UK sample was significantly more likely to want all forms of avatar help than North American and Oceania users, who wanted either friendly help or all types of help (McGoldrick et al., 2008). The moderating role of user's ethnicity match was confirmed on social presence and perceived enjoyment, but not perceived usefulness (Qiu & Benbasat, 2010). The next sub section will address both users' age and gender issues as conditions of using the admin-avatar.

#### 6.4.2.3 Gender and age

The gender of the admin-avatar also plays a critical role for some participants. For instance, Ralf preferred to deal with a female admin-avatar rather than a male admin-avatar. He believed that the gender of the admin-avatar is not important, but if there were an option on the website to choose the gender, he would choose a woman. In addition, Srin said that the gender of the admin-avatar plays a key role in users' acceptance. He tends to deal with a good-looking female admin-avatars more than male admin-avatars. These results confirmed the previous research which showed the significant differences between providers' offering and users' preference in terms of agent gender appeared (Chattaraman et al., 2011). The results revealed that users often choose Internet avatars' gender to be the opposite of their own sex (Galanxhi & Nah, 2007; Smith, 2002). In the commercial context, the consumer may choose a masculine or feminine avatar irrespective of his or her real gender (El Kamel & Rigaux-Bricmont, 2011). However, other results revealed that users follow stereotypical gender patterns when communicating with avatars that present as either masculine or feminine (Brahnam & De Angeli, 2012). From another point of view, the influence of the user's gender had no significant influence in any case (Buisine & Marti, 2007). Talha

expected to use a good-looking a female admin-avatar; if he finds a male admin-avatar, it is unusual for him and against his expectations.

*I would prefer it is like navigation. If I has navigation, I can choose between a woman and man, and me personally, I will choose a woman. So I think it is not important, but if there is an option I will choose a woman.*

Ralf, Male, Bachelor: Management, Germany

*Any individual, before clicking, will look at it how look, like if it looks interesting. Let us click on it and listen to it. Okay then while the listening, if I find it is okay, the girl is very pretty but the guys not handsome, okay if the voice is pretty flat, so maybe like after 10 or 20 seconds—no! Let's close it. Okay, so many things need to be considered to make it a success story.*

Srin, Male, PhD: Finance, India

*Characteristics related to the person—the person should be good-looking. For example, man or woman depends on the target, who the user is.... For me, it is better to see a woman; maybe for others it is better to see a man. It depends because a woman is good at marketing or maybe my expectation is to see a woman and then what I see is a man! I say why?! So it depends on your expectation before you click. This is one issue.*

Talha, Male, MSc: Business, Oman

In relation to the users' age, Jamaan expected the admin-avatar not to be a suitable tool for older users compared with younger users. This point of view supports Delia's view, as illustrated earlier, that her generation and older people are less likely to accept such technology. Jamaan's arguments and expectations are based on the idea that older users are not familiar with the internet or advanced technology.

*I believe that it is not suitable for all people, especially for elderly people because sometimes they cannot use the internet or they cannot deal with that kind of tool. But for young people it is a useful idea.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

These results are consistent with the previous research which showed that younger age groups were less likely than others to need help from avatars but more likely to need functional help (McGoldrick et al., 2008). Furthermore, the results revealed that age partially moderated effect on the differences of avatar types in terms of self-disclosure, as this effect was obvious for the opinion and capability factors of self-disclosure (Kang, 2006). In addition, virtual agent providers revealed a tendency to offer more static agents

than animated ones, with varying degrees of animation that may or may not be appropriate for older users, who also preferred the agent to be represented through the head/face only (Chattaraman et al., 2011). In contrast, no significant differences were found among users with respect to users' age (Qiu & Benbasat, 2009; Wang et al., 2007). The third demographic variable is the users' online buying experience.

Based on the discussion thus far, the first part of the taxonomy is depicted in Figure 6.3. This figure illustrates the dimensions of the admin-avatar, representing the antecedents of use. In addition, the conditions related to the users are included as moderators as they appear to either strengthen or deteriorate the influence of the admin-avatar's dimensions on the consequences related to the website (as will be discussed in the next chapter). For example, students who are familiar with the admin-avatar presumably find it easier to use (e.g., it is clear to them, they can control receiving the information and more conveniently) than students who are unfamiliar with it. The former group (those familiar with it), in turn, perceive the admin-avatar as more hedonic, useful, helpful, etc., than other students. Delia was a good example for clarifying the role of these constructs as moderators: She was unfamiliar with the admin-avatar and expected younger students to be more knowledgeable about it, meaning they would use it more easily. Although Delia is an older student and unfamiliar with the admin-avatar, she would use it even with the expected difficulties. This result supports a recent observation by Garnier and Poncin (2013), who found that researchers should examine other moderators, such as consumers' familiarity with avatars and the age of users. Investigating these conditions might give insights into understanding the proposed relationships more precisely.

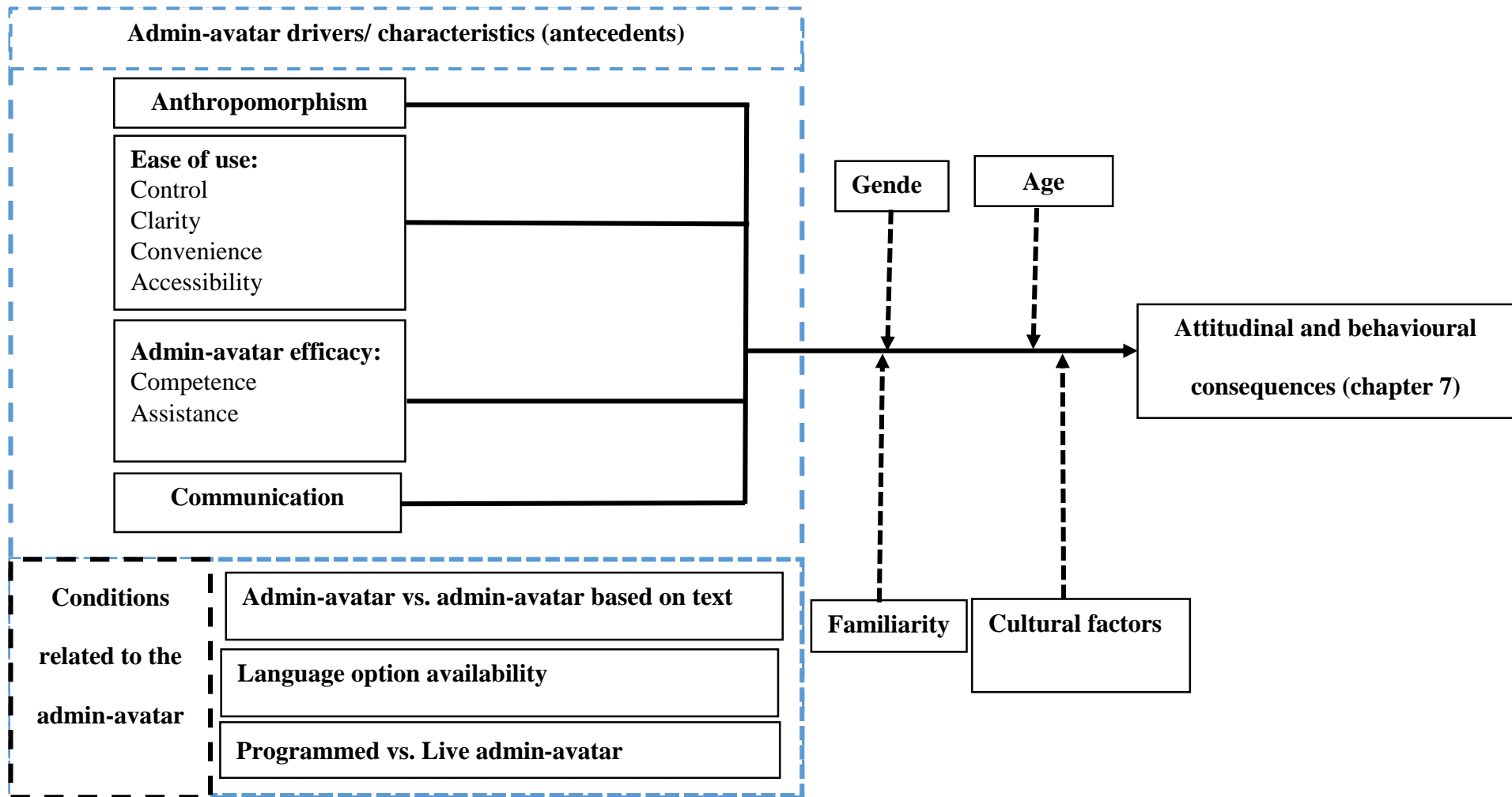


Figure 6. 3 The first part of the theoretical framework

**6.5 Chapter summary**

This chapter commenced with developing a definition of the admin-avatar based on the emerging themes from the exploratory study. The definition was contrasted with current definitions in the literature, and some other elements were added to further develop the proposed definition. The second section in this chapter addressed four key dimensions of using the admin-avatar — namely, anthropomorphism, ease of use, admin-avatar efficacy and communication. The ease of use included four factors: control, clarity, convenience and accessibility. Admin-avatar efficacy also included competence and assistance. The final section of this chapter addressed seven conditions which influence the use of an admin-avatar. These conditions are classified in two groups: conditions related to the admin-avatar and conditions related to the users. The conditions related to the admin-avatar itself included language option availability, live admin-avatar option and attachment (admin-avatar based on text), while the conditions related to the users included familiarity, cultural factor, gender and age. Chapter Seven discusses the main consequences of using the admin-avatar.

## **Chapter Seven: Qualitative data analysis and results: Consequences of using admin- avatar**

### **7.1 Introduction**

Chapter Six defined the admin-avatar concept, explored and discussed the main aspects of using the admin-avatar and the conditions that represent situational factors influencing the admin-avatar usage. For ease of presentation, this was referred to as the first part of the taxonomy, consisting largely of the antecedents of the admin-avatar. This chapter presents the second part of the taxonomy, concentrating on the consequences of using the admin-avatar. The chapter is composed of four sections: attitudinal consequences, behavioural consequences, the admin-avatar taxonomy and the conceptual frameworks. The attitudinal consequences include two main subsections: consequences related to website and consequences related to the university. The behavioural consequences include three subsections: potential to join, propensity to leave and students' voluntary behaviours. The chapter shows the emerged taxonomy from the qualitative data analysis. Finally, this chapter paves the way for the development of the conceptual frameworks that will be empirically examined (in Chapters Eight and Nine). Therefore, this chapter addresses the research objective of exploring the main attitudinal and behavioural consequences of the consumers due to after adding the admin-avatar to the brand website. Figure 7.1 shows the map of Chapter Seven.

### **7.2 Attitudinal consequences of using admin-avatar**

This section is divided into two subsections: consequences related to the website and consequences related to the university.



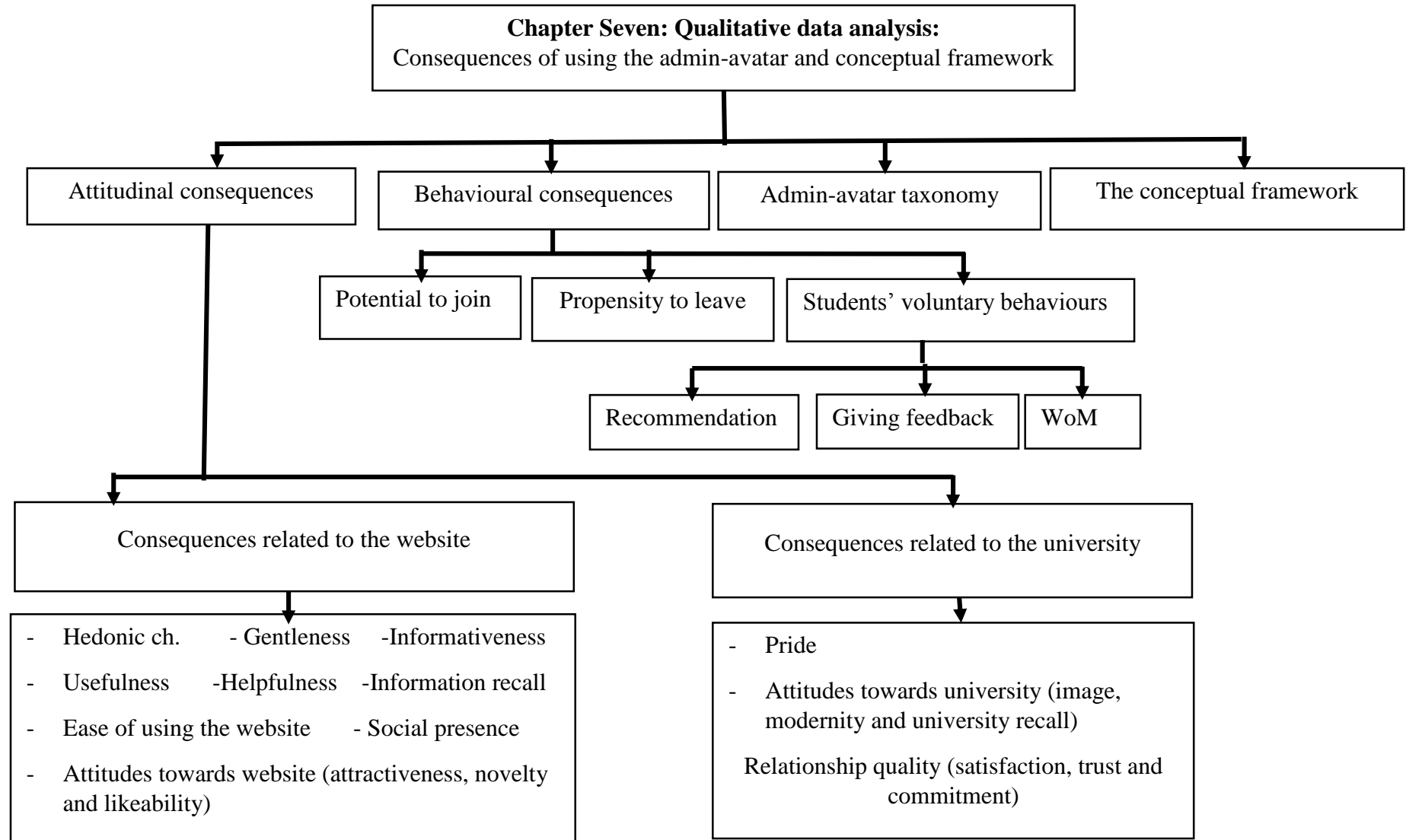


Figure 7. 1 Chapter Seven map

### 7.2.1 Consequences related to website

This subsection addresses the consequences related to the admin-avatar as part of the website as well as consequences related to the website itself. It includes hedonic characteristics, helpfulness, gentleness, informativeness, information recall, usefulness, ease of using the website, attitudes towards the website and social presence.

#### 7.2.1.1 Hedonic characteristics

Hedonic characteristics here indicate the students' feelings of enjoyment or fun derived from using the admin-avatar. Alfredo did not feel bored when using the admin-avatar compared to reading the information. For Zul, the source of enjoyment was that a real-life person was speaking, giving him the information needed when he used the admin-avatar. Participants considered the admin-avatar to be an exciting tool because of its newness and animation as a speaking three-dimensional avatar. The excitement results from using advanced technology as some initially thought it was just a photo. These results are consistent with previous studies such as Neviarouskay et al. (2010) and Jin and Bolebruch (2010), but contradict findings from Beale and Creed (2009).

*I think the admin-avatar is less boring than written information.*

Alfredo, Male, PhD: Marketing, Mexico

*I can see someone who speaks, like it can be the dean or it can be the vice chancellor, for example talking about the university or about the business school there. ... It is not boring because they can give more information and not make my eyes tired from reading the information. Like before I just saw the written text, but here we can hear because I think people prefer to hear rather than read.*

Zul, Male, PhD: Marketing, Indonesia

*It is an exciting tool because it is something new...and we can get some information from animated characters.*

Shu, Female, PhD: Finance, China

*It will be exciting because I think it is very new for me. I did not use it before, just chatting, and not this photo or just cartoon.*

Alyan, Male, MSc: Education, Saudi Arabia

Talha considered the admin-avatar as an exciting tool because it is more interactive and friendlier than the written information. He believed that the addition of this tool would help students create a positive image about the university before initiating their studies.

*Because those people, especially who will register for this, will see it as more interactive, will see it as more friendly, and they can assume that they can imagine a sort of image about the university before they come to the university.*

Talha, Male, MSc: Business, Oman

The excitement of the admin-avatar comes from it being oral. Moukhled enjoyed using the admin-avatar because he usually prefers listening to information than reading it. However, he explained that it depends on the aim of the required information. Some types of information have to be written on the website, such as forms.

*Listening is much more exciting than reading. The motivation determines which is better (the aim of information)*

Moukhled, Male, PhD: Supply chain, Saudi Arabia

According to Élise, the current condition (written information) is boring for her whereas the admin-avatar let her have fun during the search. Similarly, Srin viewed that the admin-avatar provided a fun feeling when using it. Furthermore, Chao enjoyed using the admin-avatar, especially given the large amount of information provided on his search topic. This is because reading this amount of information would bore him.

*It is funny to look this information because normally when I am looking for information it is on a website. It is very, very boring. I check everything...it is funny to look at the admin-avatar.*

Élise, Female, MSc: Financial management, France

*The admin-avatar leaves a good feeling.*

Srin, Male, PhD: Finance, India

*It is more tedious and horrible for me to get a large amount of information from text modality rather than from audio (avatar)*

Chao, Male, PhD: Engineering, China

Hedonic		Helpfulness
Gentleness		Informativeness
Information recall		Usefulness
Ease of use		Social presence
Attitudinal de towards	Attractiveness	
	Novelty	
	Likeability	

**Figure 7. 2 Attitudinal consequences related to website**

This sub section addressed the users' feeling towards the admin-avatar, especially related to the the feelings of enjoyment or fun. The next sub section will address the admin-avatar informativeness.

#### 7.2.1.2 Informativeness

Informativeness refers to the degree to which the admin-avatar is described as being informative. The qualitative data analysis found that the interviewees varied in their perceptions about whether the admin-avatar was informative or not. Some of the interviewees considered it an informative tool that did not require additional tools. For example, Shafiq believed that the admin-avatar gave him all the information he needed about the topic he listened to. Likewise, Chris believed that the admin-avatar gave him more information than he needed; preferred the admin-avatar to provide specific information.

*After listening to the admin-avatar, I feel I got all the information I needed.*

Shafiq, Male, PhD: Finance, Ghana

*It tells me more information than I would have looked for...I would have preferred to find what I am looking for instead of hearing a long-winded answer.*

Chris, Male, MSc: Business, UK

For Qadir, although the admin-avatar was informative, he thought that adding pictures, maps or videos would make the topic much clearer, more understandable and illustrative.

Supporting this point of view, Élise believed that the admin-avatar was an informative tool for most of the topics. However, some topics, such as identifying locations, need additional aid tools (e.g., maps). In addition, she believed that the admin-avatar would be more informative if it spoke in her native language, French. Holzwarth et al. (2006) confirmed the influence of avatars on the perceived informativeness.

*As I said, it is good, like it gives you all the information, but pictures and videos would make things much clearer, so that is a negative thing about this admin-avatar. It should add some videos to it, it should make it much more attractive and much easier to understand. Maps, illustrations of things — stuff like that would be easier.*

Qadir, Male, Bachelor: Accounting, Pakistan

*For me, it can be enough. It depends on the information. But for example if I need a map or something like that, she can show me yes it is enough for me. Maybe I need a little bit of text too because I need to understand better, for me I do not. For example, if it was in French, in my personal language, I would not miss the text. It is only an avatar. It is good for me.*

Élise, Female, MSc: Financial management, France

Zul did not believe that the admin-avatar would be informative if it was only put on the website to provide information. Other tools could give more complete information about the topic he searched for and should support it. Talha believed that the informativeness of the admin-avatar is a relative issue; it could be informative for him, but not others. Therefore, different tools should be provided on the website so the user could choose among those perceived to be most informative. Alyan emphasised that the admin-avatar neither sufficient nor appropriate, in some cases, for providing the information on the webpages. These points of views indicate that the admin-avatar was not sufficiently informative to provide the information on the website and should be supported by other tools or methods, such as videos, images, and maps.

*I do not think so, it is not sufficient if we use only the admin-avatar. They have to combine it with other tools because when we use only the admin-avatar, maybe we will miss something there. But when we use other tools, for example video or text, we can read that.*

Zul, Male, PhD: Marketing, Indonesia

*I think other formats providing this information should be there because they do not know who the other party or consumer is. In this case maybe the consumer cannot hear, cannot see...the websites should provide*

*different ways of providing its information. So, the admin-avatar only is not enough; it will limit the flow of information from both parties.*

Talha, Male, MSc: Business, Oman

*I prefer to see the text and admin-avatar at the same time...so not just the admin-avatar. On some webpages it is appropriate to put video links for students to tell them about university because, believe me, it will not be enough for all webpages.*

Alyan, Male, MSc: Education, Saudi Arabia

### 7.2.1.3 Helpfulness

The helpfulness construct shows the degree to which participants perceive the admin-avatar as a helpful tool on the website. Srin believed that this admin-avatar would be a helpful tool for students, especially undergraduate students, who are starting a new educational stage which differs from the school stage. However, he did not expect it to be a helpful tool for postgraduate students, particularly research students. Zul believed that a person who prefers hearing the information rather than reading it would perceive the admin-avatar as a helpful tool, but someone who prefers reading would not. In addition, Hamdan perceived the admin-avatar as helpful as someone was giving him information through the voice instead of reading.

*It will be helpful because the majority of the students in the graduate university come just after finishing the school and they will find this feature an exciting one. And in the masters I will say so, but I do not know the majority researchers at Hull.*

Srin, Male, PhD: Finance, India

*I think it is helpful especially for someone who just wants to hear directly about information, not read it. Maybe if he or she has just a little time to get the information, maybe he/she can hear this and do something else, yeah. They can be combined, but in ready text, they should focus on the text if they want to get information.*

Zul, Male, PhD: Marketing, Indonesia

*I mean that it is helpful in terms of when I see someone speak because if I, for example, just read something sometimes it is boring to read information, but when someone gives me sound, I think it is better.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

Furthermore, Khulood believed that the degree of perceived helpfulness depends on the extent of providing the complete information, like the text condition, and in a clear way. In

addition, if the admin-avatar does not help the website visitor, it should offer other ways to help him/her, such as email or a telephone number. The admin-avatar is a helpful tool as it saves students' time. In contrast to Khulood's opinion, Ralf believed the admin-avatar to be a helpful tool if it delivers short important information. Some previous studies have confirmed the relationships of similar concepts with the admin-avatar, such as the virtual character (e.g. van Vugt et al., 2006) and embodied agents (McBreen & Jack, 2001), and perceived helpfulness.

*If it is used on their website, they really have to put a strategy in terms of all the questions the avatar has to answer and it is really has to match what is in the text. What they write in the text and provide, like a replacement, if the answers do not really fully satisfy consumers' needs, they have to make that very clear that they care about inquiries. If this avatar did not help me get a full response, 'please go to this email or please call this number that will help you'. ... It will save their time. So it is really helpful.*

Khulood, Female, PhD: Accounting, Oman

*As I said, it could be helpful for really short information, like important information, if okay. For example, it can bridge the main points I had in the first year: how to submit an essay, how to get information resources, where to find tutorials — something like that. Main question and answers to them. That would be helpful and useful with this, but only on the website, I do not think it would be so useful.*

Ralf, Male, Bachelor: Management, Germany

Xu imagined that the admin-avatar would not be a helpful tool for international students as they may not understand the provided information. However, for native English speakers, it would be helpful for them.

*The main problem will be for some students from other countries. They may not understand totally the message, so they may prefer the text rather than the admin-avatar. But for people with a good English background, I think it is really helpful for them.*

Xu, Male, PhD: Finance, China

This sub section addressed the users' feeling towards the admin-avatar to show whether the admin-avatar is helpful tool or not. The next sub section will address the admin-avatar gentleness as another attitudinal consequence related to the website.

## 7.2.1.4 Gentleness

Gentleness indicates the degree to which the admin-avatar is described as being safe for the user's health. Shu stressed that listening to the admin-avatar is safer for users' eyes than reading the written information on the website. She gives an example of herself. Her sight has gotten very weak since starting her PhD programme, and she believes that the main reason is the long readings. Talha viewed that adding an admin-avatar to the website would stop students from reading the information, which positively helps their sight. Similarly, Alyan believed that the admin-avatar would be safer for his sight, particularly as he wears glasses.

*Definitely, it is good for the eyes because when I started my PhD my sight was not good, seriously, because I have to face the computer to do a lot of work. I have to read and type, so I have to look at the screen. But sometimes I can close my eyes and just listen which is good.*

Shu, Female, PhD: Finance, China

*Even the eyes because when I read I concentrate on the screen, but when I listen I do not even concentrate on the person, so I can hear very freely. So health-wise it might be much better in this case.*

Talha, Male, MSc: Business, Oman

*For my eyes, it will be nicer than reading some short or big texts or small words because I wear glasses, so it will be good.*

Alyan, Male, MSc: Education, Saudi Arabia

Zul believed that, although the admin-avatar makes him more comfortable than reading in terms of his eyes, there is no big difference between them. For Qadir, the admin-avatar can be healthier for users' eyes, but have negative effects on their ears, particularly if they listen to the admin-avatar through headphones.

*Maybe this is good for the eyes but not too different with the text...using the admin-avatar will make us comfortable to hear the information to read that. ... It gives more information without making our eyes tired. Like before we just saw the written text but here we can listen because I think people prefer to listen rather than read.*

Zul, Male, PhD: Marketing, Indonesia

*It might because it protects my eyes. When I read a lot it might affect my eyes. But at the same time it is causing noisy things so that is a negative side, but it depends on what I use. Maybe if I am using headphones it is also really dangerous for the ears, so it can be both senses: It is either good or it is bad.*



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Qadir, Male, Bachelor: Accounting, Pakistan

No previous study has linked gentleness construct to avatars or other similar concepts, such as virtual character, embodied agents and animated pedagogical agents. The next sub section will address the admin-avatar usefulness as another attitudinal consequence related to the website.

#### 7.2.1.5 Usefulness

Usefulness indicates the degree to which a user describes the admin-avatar as being useful in the sense of doing its tasks. In general, Chao believed that the admin-avatar was a very useful tool for providing information on the website. Mensah viewed that the admin-avatar would be more useful than the current condition of providing written information.

*It is very useful to get information from the website in this way.*

Chao, Male, PhD: Engineering, China

*I might find an avatar more useful than reading.*

Mensah, Male, PhD: Economics, Ghana

Hamdan reasoned that the usefulness of the admin-avatar stemmed from his ability to pick out the required information during the speech more easily and quicker than from the written information. For Élise, the usefulness of the admin-avatar results from the replacement and simulation of face-to-face communication. She considered the admin-avatar to be a person, such as the university receptionist who answers students' inquiries. As such, it saved her time because she can get her answers from home. Supporting the qualitative results, previous studies confirmed the influence of avatars on perceived usefulness. For example, the degree of anthropomorphism of an avatar was shown to enhance perceived usefulness (Qiu & Benbasat, 2010). The perceived usefulness of the avatars is important for the chances to use them (Suh et al., 2011).

*It is useful because if I listen to someone I can listen without focusing on what they say, but I can take what information I want and then leave it. I think it is easier and quicker than just reading information.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

*I think it is useful because I need to receive information in this way. For me it is better. It is like coming here and asking someone in reception. So maybe if this admin-avatar is not here, I would prefer to go to reception.*

Élise, Female, MSc: Financial management, France

Zul concluded that the admin-avatar was very useful, especially for new and potential students, and was an effective communication tool. He supported Hamdan's point of view that using the admin-avatar helps stress the important and required information the users need, whether by picking it up or repeating the required part. Ralf declared that the usefulness of the admin-avatar is evident in certain cases, such as an instructor on students' platforms or Central Authentication Service (i.e., ebridge) giving short descriptions to them. Jamaan also identified two conditions when the admin-avatar would be a useful tool — namely, the online admin-avatar, which gives immediate information or queries the users, and for younger users who are heavy technology users.

*I think especially for new students they can get information in an effective way in communication. [They] not only need that because if we just read maybe we can forget something else, but by using the admin-avatar we can get the information and if we want to stress or focus on it, we can repeat it again.*

Zul, Male, PhD: Marketing, Indonesia

*It could be quite useful if we have, like, links where somebody is telling us something or even on ebridge when you have a short description instead of having a handbook.*

Ralf, Male, Bachelor: Management, Germany

*If it provides a service which is online, I think it will add value to the consumers. But if there is no online communication made, there is some limitation to it. ... So it depends what we want to do. But in the end we will deal with the young people so it is useful information to use a digital tool in this case.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

However, Matthew questioned the usefulness of the admin-avatar for all students, saying some would not get any benefit from it. Therefore, the text or written information should be included with the admin-avatar to benefit all users of the website. Consistent with these

point of views, the previous studies also revealed that videos were rated as being far more useful than avatars (Clayes & Anderson, 2007).

*I am not quite sure. I think it is a useful thing to have on the website. It could help some people, some people might like it, but some people might not. So it is better to put text as well.*

Matthew, Male, Bachelor: Biomedical, UK

This sub section addressed the users' feeling towards the admin-avatar to show whether the admin-avatar is useful tool or not. The next sub section will address the admin-avatar gentleness as another attitudinal consequence related to the website.

#### 7.2.1.6 Information recall

Information recall indicates the degree to which a user remembers the information provided by the admin-avatar. The qualitative data analysis identified a division between interviewees with respect to information recall. Some interviewees liked the admin-avatar because they believed that receiving the spoken information helped them remember it. For instance, Abdul-Aziz could remember the information provided through the admin-avatar better than when he read it. Talha shared an example in which he compared two cases: hearing a story orally versus reads reading it. He said he would certainly remember the story received orally.

*By listening to the information, I can remember this better than reading.*

Abdul-Aziz, Male, Bachelor: Engineering, Saudi Arabia

*I remember the information which is spoken information more than the information that I read. For example, if you told me a story now, I could remember it after five years but not the same story if I read it.*

Talha, Male, MSc: Business, Oman

According to Élise, the issue of information recall depends on the user's personality. She can better recall information which she heard or wrote than what she read. Therefore, she expects to be able to remember the information provided by the admin-avatar better than via the traditional manner (written information). Previous studies have failed to examine

information or data recall, although Buisine and Marti (2004) and Stevens et al. (2013) found that the embodied conversational agent's appearance affected data recall.

*I remember listening and writing more than reading because in reading I do not remember a lot. If I read I need to write at the same time; if not, I do not remember what I read.*

Élise, Female, MSc: Financial management, France

Yet other interviewees voiced concern about recalling the information provided by the admin-avatar. Joseph defined one of the main problems in using the admin-avatar as it is easier to forget the information compared to written text. Qadir directly contradicted Talha's point of view, saying that people usually forget information they hear but not what they read. He concluded that information forgetfulness is one of the main disadvantages of using the admin-avatar. Olivia considered the admin-avatar a modern tool, but said it would not help her remember the information.

*One can easily forget an avatar advert, but a written advert can be read many times over.*

Joseph, Male, PhD: Systems studies, Nigeria

*I would just give you an example of like people always lose interest in someone speaking after like the first five minutes. So, I will remember anything probably. So I would I say even the same thing in the reading. That is negative side of the admin-avatar — you always forget what I hear. In the end it is a negative side of the admin-avatar.*

Qadir, Male, Bachelor: Accounting, Pakistan

*Just spoken words by an avatar would not help me remember the information as much.*

Olivia, Female, PhD: Systems studies, USA

Delia explained that she prefers reading the written information because she usually takes notes to remember the information. Therefore, replacing written information with the admin-avatar might cause some problems for her as eh could miss some important information while listening to the admin-avatar.

*As my memory is not very good, I have to write everything down and it is only when I write something this actually sort of goes in through my brain and sticks. So when I read something that is good. When somebody tells me, I sometimes miss some pieces of information, so I do not know, I do not know — you have to test that.*

Delia, Female, PhD: Marketing, UK

Although Matthew can remember the information provided through the admin-avatar, he prefers keeping the text with it because sometimes he does not remember all the information. Consequently, keeping the written information with the admin-avatar is crucial for making a copy of it or saving it as a document.

*I prefer reading something to someone telling me it because actually I want to do that. I will remember it, but as I said, it is best have text as well so in case someone wants to copy the text or save it or something.*

Matthew, Male, Bachelor: Biomedical, UK

This sub section addressed the users' perception towards the admin-avatar to show whether they will recall the information provided by the admin-avatar or not. The next sub section will address the admin-avatar social presence as another attitudinal consequence related to the website.

#### 7.2.1.7 Social presence

Interviewees considered the social presence construct to be one of the highly discussed constructs. Adding the admin-avatar to the website affected participants' sense of social presence. For instance, Jamaan felt that the admin-avatar was a human who could discuss any point on the website with him. Abdul-Aziz also perceived that he was dealing with a human and, while listening to the speech, he imagined it and life in the university environment. In addition, Larkai believed that adding the admin-avatar to the website created a type of physical communication. Matthew said that including the admin-avatar as an assistance tool when providing information produced a feeling like having face-to-face communication. He explained that dealing with the admin-avatar was not totally like face-to-face communication, but very close due to its speaking. His response suggests that the human characteristics of the admin-avatar, such as the face and voice, made Matthew feel like someone was dealing with and speaking to him on the website. Hamdan imagined that the admin-avatar could play real administrator roles on the website by providing the required information and answers to his inquiries as he linked between what he had to do at the time

to get the information and what would happen if an admin-avatar was added. These views reflect high degrees of social presence.

*I think I can feel it, I can feel that I am discussing with a man or woman through the website.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

*I prefer listening because it provides an opportunity to imagine the speech of the avatar and live in the university environment. I feel like I am talking to a real human.*

Abdul-Aziz, Male, Bachelor: Engineering, Saudi Arabia

*In the admin-avatar condition, I feel like there is a physical communication between me and someone else. Likewise, someone is interacting with me.*

Larkai, Male, MSc: Business, Ghana

*The admin-avatar is like a tool that helps me. So that is, I ask the question, it responds. It is helping me. It is like face-to-face communication. I think it is serving a purpose. It does make it easier to listen to someone speaking. I think listening to someone face to face is nicer than just reading this university website. It is just nicer to have someone just speaking to me, I guess. Obviously, it is not face-to-face communication, but it is closer to someone speaks to me.*

Matthew, Male, Bachelor: Biomedical, UK

*When I talk to someone face to face, it is better than just reading information. For example, when I go to the undergraduate office here in the business school and I ask about — for example — about my timetable, when I have something like this avatar, s/he will answer me and I think that it is better than just reading information. I think it is good.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

Some participants perceived the admin-avatar to be more like a robot than a human. For example, Khulood perceived the admin-avatar to be a robot programmed to provide specific information. Supporting this point of view, Ivan and Ahmad said that the admin-avatar's voice was more robotic than human, or it was an unnatural voice, which produced uncomfortable feelings for the listeners. In addition, Malik viewed the admin-avatar as a robot, not a human, but said that enhancing its voice and adding some emotions and impressions could increase the feeling of it being more human than robot.

*I do not think that I am connected to a human being. As I said earlier, it looks more like a robot who is programmed than like a human responding to questions.*

Khulood, Female, PhD: Accounting, Oman

*However, the spoken avatar sounds not that good since the way they speak is more like a robot, which causes some uncomfortable feeling in the long run.*

Ivan, Male, PhD: Finance, Bulgaria

*Well, it feels unnatural though, because its sound is unnatural.*

Ahmad, Male, Bachelor: English literature, Brunei

*Personally, the robotic-like voice does not appeal to me. If there should be a spoken description, it should be a human voice as it can also feel the emotion or passion about what s/he is describing to me.*

Malik, Male, Bachelor: Engineering, Nigeria

The absence of the possibility of immediate voice response messaging reduces the sense of dealing with the admin-avatar as an individual. Zhiyuran did not believe the admin-avatar was human because there was no option to respond immediately on her queries via voice. Delia did not expect any more information or response from the admin-avatar as it was programmed and not real, even suggesting using the phone as a communication tool to contact the real administrator in case of further inquiries.

*I still deal with it as an animated character because if human being, like us, I talk to you and you talk to me. I can talk to you.*

Shu, Female, PhD: Finance, China

*I do not expect her to give me any more information than I'd normally receive from the website and I am always thinking the website, like I said, is a leaflet or brochure. It is just more convenient. ... That is a bit of a funny one. If she was doing conversational information, giving it might feel a little bit almost like too distant, but then I don't know. You can always pick up the phone, she can offer to phone me ... and it does feel more personal.*

Delia, Female, PhD: Marketing, UK

Emphasising the previous point, Talha concluded that the admin-avatar was still one-way communication as he just received the information. The interaction in this case was still limited because he could not control the interaction by moving to another point or stopping the current one. However, he considered the admin-avatar as an attempt at human interaction simulation. The autonomy of the admin-avatar, being programmed, decreased the perceived social presence because there was no option for responding. To increase the perceived social presence, Qadir said that a live admin-avatar option should be added to provide the responding element in the communication.

*I feel part of it, not the full, because although it is spoken language, it is one-way communication. It is not two-way communication. I cannot interact, I cannot jump in the middle to another subject or ask a new question or stop her. I cannot do this so there is not much from my side and there is not much control from his/her side. ... It simulates the human interaction but there is no control. There is no full control in the process of communication.*

Talha, Male, MSc: Business, Oman

*I think, so it is like if the admin-avatar speaks, I will just understand it, but I cannot respond because it is just programmed, it cannot help me out by telling me more about the website in a talking way. But I cannot respond because I do not think that programme can understand what I am saying to them. So they will not respond to it. A live admin-avatar will increase the response element, and I think it is a great idea to improve admin-avatar.*

Qadir, Male, Bachelor: Accounting, Pakistan

Zul highlighted two main features to increase the perceived social presence—namely, using real images in the admin-avatar and providing immediate responses to any questions or queries. Furthermore, Élise indicated that there was no possibility of talking to the admin-avatar, thereby reducing the social presence. The admin-avatar's responses also determine the degree of the social presence. However, Élise identified a critical point: If the admin-avatar could not respond to the visitor's query, there should be another option for getting the answer, such as a telephone number.

*In case of putting the avatar of the dean, I can see that it looks like the real dean talking to me, giving information. Yes, I think maybe it would be more attractive if the university could use attractive two-way communication. When you click something or you ask something, they can answer that directly. Yeah maybe a live avatar is better for the students as if I use iPhone. For example, I ask about something and the admin-avatar can answer immediately.*

Zul, Male, PhD: Marketing, Indonesia

*She answer me. I do not speak with her, I write the question. So it is as if I give her some questions and she answers me, she understands me so ... she needs to say something, like 'I cannot respond to you. If you need some help, you can call this number' or something like that, not close the door. Because if I'm looking for information and she answers a lot of things and one moment she says 'no I cannot answer', it is like a catastrophe.*

Élise, Female, MSc: Financial management, France



Supporting the previous points of views, the relationships between avatars or similar concepts and the social presence have been examined in previous studies. For instance, avatars provide a means for the social presence (Aljukhadar & Senecal, 2011; Li et al., 2011; Montoya et al., 2011; Schwarz et al., 2012). The degree of social presence increases when users participate with avatars or embodied conversational agents due to eliciting a sense of proximity in the virtual worlds or virtual communities (Animesh et al., 2011; Groom et al., 2009; Larach & Cabra, 2010; Qiu & Benbasat, 2009; Wasko et al., 2011). The interaction with other avatars leads to an emotional state of being with others (Schwarz et al., 2012). In addition, adding facial movements to avatars strengthens the sense of presence (Franceschi et al., 2009).

In contrast, Mensah expected negative impressions towards the university because the admin-avatar decreases direct contact between students and the real administrator. The lack of direct contact reflects the lack of perceived social presence during communication.

*The negative impression towards the university thus raises concerns that there would be a lack of direct contact, that the contact is reduced and replaced by the admin-avatar.*

Mensah, Male, PhD: Economics, Ghana

This sub section addressed the users' feeling towards the admin-avatar to show whether they could feel someone on the website talking to them or not. The next sub section will address the admin-avatar ease of using the website as another attitudinal consequence related to the website.

#### 7.2.1.8 *Ease of using the website*

Ease of using the website indicates the degree to which a user perceives the website to be easier to use after incorporation of the admin-avatar. According to Chao, the admin-avatar made the website more accessible. Matthew believed that adding the admin-avatar on to the university website made it simpler than the current version of the website or other universities' websites. After the addition of the admin-avatar, the users just need to press on

the subtitles or hyperlinks to listen to the information related to them. These views are in line with some previous studies, for example, which showed that avatars could support the ease of navigating the websites (Benford et al., 2001) and enhance the navigation experience (Aljukhadar & Senecal, 2011).

*I feel the website is much easier to access.*

Chao, Male, PhD: Engineering, China

*It looks easy to use. I mean, if I'm on this website and I saw the admin-avatar does a play button, I would press the play button to listen to her.... Some universities have really complicated websites. ... And if this does something like this, it will simplify the website ... Yes it is just easier to just listen, it is just like generally nice to think about the website — it makes it cool.*

Matthew, Male, Bachelor: Biomedical, UK

Ralf said he would be impressed if the website included the admin-avatar because of its novelty, and he would perceive it as being easy to use. However, providing only an admin-avatar without the written information might cause people to leave the website, even if it is easy to use, because of problems getting the information from the admin-avatar itself. Similarly, Alyan said that adding an admin-avatar to the website would make it nice and easy to use the website. However, some users do not have enough time to listen the whole message of the admin-avatar. In other words, users can skim written information to get the required information quickly.

*I think if I go to the website the first time, I will be impressed I think if I see something new ... if I only have the admin-avatar, I think there would be many people who do not like that and that will lose so many people getting on this website. They maybe would go to another website. That — in my opinion, they should put both an admin-avatar and text.*

Ralf, Male, Bachelor: Management, Germany

*It will be very nice to see this tool on the website of the University of Hull ... so, I like to follow and see any website follow new technology to use new tools for students.... I do not think it would be difficult to use the website with an admin-avatar. I think it will be difficult for some students because they do not have enough time to just hear. They just have — like, one second to one minute — to look the information and text.*

Alyan, Male, MSc: Education, Saudi Arabia

This sub section addressed the users' perception towards the website to show whether it is easy to use after adding the admin-avatar or not. The next sub section will address the admin-avatar the attitude towards the website as the last attitudinal consequence related to the website in this research.

#### 7.2.1.9 Attitude toward the website

Attitude towards the website refers to the degree to which a student believes that the website with an admin-avatar is attractive, novel, and likeable. Srin initially noted that many organisations' websites — university websites in particular — suffer from complexity, which is considered to be a barrier between the organisation and its consumers. He believed that the website should be well organised and visually attractive to ensure consumers' likeability of the website.

*It should be decent, neat and clean and then appropriate information should clustered within the relevant subheadings, and easy links should be there. So visually, it should be attractive and very easy to spot information. Designing websites is very problematic so that is why I like the website to be clean*

Srin, Male, PhD: Finance, India

The qualitative data analysis emerged three aspects related to the attitude towards the website after adding the admin-avatar: attractiveness, novelty and likeability. These aspects will be discussed in the next sub sections as follow:

##### 7.2.1.9.1 Attractiveness

The attractiveness of the admin-avatar and website itself was identified by a great number of interviewees. Shu believed that adding an admin-avatar to the website makes it more attractive than a traditional or current website because the admin-avatar offers some unique characteristics, such as moving, visualising and talking. Unlike the current avatars on some websites, the admin-avatar can move its head, do nonverbal expressions, and speak to users. In addition, Élise concluded that the website was more attractive after the addition of the admin-avatar as it increased her attention and would lead to her staying on the webpage

longer. Hamdan expected that adding an admin-avatar would attract users, particularly international users, because it would improve the website and make it attractive. In a previous study, Holzwarth et al. (2006) examined attractive avatars influence on the user's persuasion.

*It makes the website more attractive. It just before included pictures and most of them did not move or change, maybe just picture after picture and now a cartoon character is there and it can move and make some visual expressions and talk too. It is attractive, like watching a cartoon.*

Shu, Female, PhD: Finance, China

*The admin-avatar is liked more. She gives more attention so I want to stay on this page more than when she is not here. Admin-avatars increase my attention on websites.*

Élise, Female, MSc: Financial management, France

*I think this idea will improve our website and will attract all people, especially international people.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

Matthew expected the addition of an admin-avatar to make the website better than the current version. It would attract users' attention and keeps them on the website longer. Supporting Matthew's point of view, Naveed declared that, if the admin-avatar was added to the university website, he would log in daily to discover its interesting feature and try to get benefits from it. Ram believed that the admin-avatar was an entertaining tool and useful for getting the information as well. A website including an advanced tool such as an admin-avatar would attract him to navigate it.

*I just think the website will make it better, like I said before, and increase people's attention using it and people will just look more.*

Matthew, Male, Bachelor: Biomedical, UK

*I will log on to the university website on daily basis to find further interesting features regarding my area of interest and other opportunities that I can get benefit from.*

Naveed, Male, PhD: Supply chain, Pakistan

*Staying to play more with the avatar to find out useful information ...  
Feel that the website is so attractive by employing advanced technology.*

Ram, Male, PhD: Politics, Thailand

Zul believed that a website's attractiveness stems from the feelings of a human presence on the website. This is because he considers it to be like face-to-face communication, where

there is a real administrative person on the website talking directly to him. Akmal expected admin-avatar to intrigue him to find more information about the website. It would also make him more receptive than the traditional version of the website.

*I think it makes the website more attractive, more human, because it looks like I get information directly from someone from consumer service talking about the university or from the dean talking to me directly about the university about the faculty. I think the website becomes more communicable for us.*

Zul, Male, PhD: Marketing, Indonesia

*It becomes more intriguing for me to find the information which is on the website. It builds and adds interest for me to know more about the website ... I become more receptive to finding the information revealed by the avatar.*

Akmal, Male, Bachelor: Law, Malaysia

Some researchers have demonstrated that an attractive avatar improved consumers' persuasion towards products (Holzwarth et al., 2006). Users perceived human spokes-avatars as more attractive than non-human spokes-avatars (Jin & Bolebruch, 2009; Jin & Sung, 2009 & 2010). In addition, avatar attractiveness significantly affected product performance (Lee et al., 2013). In the next sub section, the novelty of admin-avatar and the website itself will be addressed.

#### 7.2.1.9.2 Novelty

Novelty refers to the degree to which the website including an admin-avatar is perceived to be distinct and notable. According to Qadir, adding an admin-avatar to the university website makes it unique. Delia had not seen an admin-avatar on a website before the interview, so she thought it made the website novel and "futuristic." She preferred this website because the idea of adding an admin-avatar to it was so novel.

*It makes the website good and keeps it unique.*

Qadir, Male, Bachelor: Accounting, Pakistan

*I have not seen an avatar like this on any website before so for me it does feel very much like the future. I have seen things like this only in films and films about the future, but this feels very sort of futuristic but it just from first glance I'm interested. ... I have not got a very strong awareness about avatars or very early knowledge about this area so it is new for me ... They are all things that we like to think the university represents to the*

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*prospective students so now I think this is new, this is a very novel idea for me, but I really like it.*

Delia, Female, PhD: Marketing, UK

For Qadir, adding an admin-avatar made the university website unique compared to other universities' websites, meaning the website would be attractive for students. In addition, he said that this indicates that the university is technologically advanced and the students are likely to accept this level of advanced technology, particularly a live admin-avatar. Furthermore, the novelty of this idea is the simulation of face-to-face communication.

*I think so, it will be a good idea. Having or introducing the admin-avatar makes the university website unique, different, like University of Hull is always trying to keep themselves unique and different from other universities. Plus, as a student, I would say students are welcoming and accept new technologies because that makes the university more technical and better from the point of a person who is applying for a computer degree. ... One of the most unique things in the admin-avatar is it makes a more attractive website and I feel like this is someone to help me if I have to go online shopping. This is live chat.*

Qadir, Male, Bachelor: Accounting, Pakistan

Supporting Qadir's point of view, Srin viewed the admin-avatar as an innovative method for providing information on the website. It keeps the website unique until other universities start launching admin-avatars on their websites.

*This is an innovative method of attracting the attention of potential consumers ... so the university is using a specifically competitive branding and promotion tool. If everyone is using it, there is no competition! Okay ... what to say just because the University of Hull is using an admin-avatar it is a unique feature to Hull, but if all universities started using them?!*

Srin, Male, PhD: Finance, India

Jamaan concluded that the university is advancing its website by adding unique ideas. These ideas make it notable for the users. In addition, they create a positive attitude towards the organisation within the user. The uniqueness of the admin-avatar comes from it being three-dimensional and moving its head, according to Alyan. Furthermore, Ralf stated that the uniqueness of the admin-avatar comes from its real-life voice, which helps attract users during the search process or contact. He explained that it solves a problem because he

usually goes to the university reception to ask questions instead of reading the available information on the website. He believes the website is more personal with the admin-avatar.

*I think it is a unique idea that it tries to make, like a distinction or presenting a new idea to the audience. So, it is not a traditional idea. It is a modern tool that encourages people to know something about the organisation.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

*It is very new for me, especially in the University of Hull because the face is very new for me because I usually see like a cartoon, not like this face. She can move her head.*

Alyan, MSc: Education, Saudi Arabia

*It is more personal because the voice is talking to me and it is a woman and I am a man. It is like I get in touch with that, so somebody is talking to me. Personally, I prefer — instead of reading some information on the Internet — I go to the undergraduate office and ask them because there is a person responding and if I do not understand one point, I have a real person in front of me. But even that I feel with the admin-avatar, I feel more attached to the field. It is more personal because somebody is talking to me.*

Ralf, Male, Bachelor: Management, Germany

For Élise, the novelty of the website comes from the presence of the human represented by the admin-avatar. It allows direct contact or face-to-face communication on the website. Similarly, Zul expressed that the human form of the admin-avatar is the main reason for the novelty. The voice of the admin-avatar makes him perceive the website to be more personal and interesting than the presence of only text.

*It is very different. It is like direct contact with the avatar, like face to face, and like someone trying to help me so it is better than video. When it is video, it is not and cannot choose the information.*

Élise, Female, MSc: Financial management, France

*I think the novelty of the admin-avatar is the new one, it looks like a human talking to someone else. A person is more human than text. If you just read a text and become bored, and by using the admin-avatar it looks like communicable, it is easy to see not only the text but also how the avatar says something.*

Zul, Male, PhD: Marketing, Indonesia

Finally, Samuel said that adding the admin-avatar makes the website unusual because he usually finds only written information on webpages.

*I feel it is unusual. My expectation usually is the text modality, and I find it is easier to understand. So I think it is a slightly strange approach for me.*

Samuel, Male, PhD: Media, Nigeria

The literature review found a lack of studies examining the avatar's influence on users' perception related to the novelty as there was no study examining this effect or similar concepts on users' pride was found. The next sub section will the likeability of admin-avatar and the website itself will be addressed.

#### 7.2.1.9.3 Likeability

Likeability indicates the degree to which the student likes the admin-avatar as part of the website as well as the website itself. Matthew liked the website with the admin-avatar, particularly as he perceived it to be unique compared to other university websites. Talha preferred the addition of the admin-avatar to the university website. However, it should be selective with regard to specific information because the admin-avatar would not be clear in providing some types of information. In addition, the pictures of the admin-avatar should be chosen carefully.

*University of Hull would be the only website to have it, which is a cool university. It is clear the University of Hull website is better than other universities' websites.*

Matthew, Male, Bachelor: Biomedical, UK

*I think providing the admin-avatar within the website of the University of Hull is a good feature, but it should be selective — selective in where to put it, okay, selective for the faces that will appear in the windows. And they have to be concerned about the technology and clarity of information.*

Talha, Male, MSc: Business, Oman

The interviewees' perceptions of likeability were affected by several factors. For example, Tauseef liked the admin-avatar because it was a great experience for him to hear the provided information. Similarly, Srin preferred the admin-avatar because he liked hearing the information rather than reading it. In other words, hearing the information was easier and gave him the impression that someone was talking to him or giving him the information in face-to-face communication.



*All in all, it is a wonderful experience to hear information through an avatar.*

Tauseef, Male, PhD: Finance, Pakistan

*I prefer listening to information rather than seeing it or reading it. So if information is given to me for one option to listen and another option just to read it, I always prefer the admin-avatar because sometimes reading is a problem and listening is much easier than reading. So whatever is written, if somebody is speaking, I feel as if someone is talking to me, so I get information in a more interesting fashion and it takes less time.*

Srin, Male, PhD: Finance, India

In addition to preferring to hear information, Ralf said that he preferred the idea of the admin-avatar because he believed it simulated real-life interaction between administration and university students, even it was still one-way communication. He saw it as an attempt to make the website more personal or realistic about what happens in the university. Hamdan preferred the website with the admin-avatar because of its novelty; he had never seen any university website with an admin-avatar.

*I prefer, instead of reading some information on the Internet, to go to the undergraduate office and ask them because there is a person responding and if I do not understand one point I can really get what I want. That is another thing because I have a real person in front of me, but even that I feel with admin-avatar more attachment to the field. It is more personal because somebody is talking to me, even if he does not understand what I am saying.*

Ralf, Male, Bachelor: Management, Germany

*I like this idea because it is something new and when I see something new for example I will like it ... I have not heard about this before in any universities, but this on the website — it will attract many people.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

In contrast, Cong does not prefer the website after adding the admin-avatar because he likes keeping the text or the written information on the webpage. He cannot get the need information through listening admin-avatar.

*I prefer reading rather than listening. I prefer information to be provided through text.*

Cong, Male, PhD: Supply chain, China

Previous results support the qualitative results of the current research which linked between likeability and other emerged constructs, such as anthropomorphism, satisfaction, trust and attitude towards the retailer or brand. The other constructs were discussed in the previous

sections of this chapter or will be discussed in the next sections. For example, avatar likeability mediated the influence of the avatar's attractiveness on the satisfaction with the retailer, attitude towards the product, and purchase intention (Holzwarth et al., 2006). The majority of consumers prefer to shop on the Internet for products using an avatar-shopping assistant (Keeling et al., 2010). Users perceived the social/human-like characters as more likeable (Luo et al., 2006; Wang et al., 2007) than the cartoon-like characters, in turn leading to stronger trust (Luo et al., 2006). Adding an empathic (well-animated) avatar affected the likability of the system (Lisetti et al., 2013).

### 7.2.2 Consequences related to the university

This subsection addresses the consequences related to the university. It includes pride, attitudes towards the university, relationship quality and student orientation.

<b>Pride</b>	
<b>Attitude toward brand</b>	<b>Image</b>
	<b>Modernity</b>
	<b>Recall</b>
<b>Relationship quality</b>	<b>Satisfaction</b>
	<b>Trust</b>
	<b>Commitment</b>
<b>Student orientation</b>	

**Figure 7. 3 Attitudinal consequences related to university**

#### 7.2.2.1 *Pride*

The qualitative data analysis indicated that participants differ in their pride as university students as a result of the addition of the admin-avatar. Ralf believed that adding this feature to the university website was a good idea, but it did not makes him prouder of the university. Talha said he would not be proud because of the addition of the admin-avatar, but he would

feel proud if he heard his friends or students from other universities talking about this feature on his university website.

*It is not like I'm proud because the University of Hull added an admin-avatar.*

Ralf, Male, Bachelor: Management, Germany

*I mean not proud, but it is good to have something to go out, but I am not proud that they are using it.... I am a student. Maybe I will be proud when I see, for example, students from other universities talking about this feature of the University of Hull — at that time I'll be proud.*

Talha, Male, MSc: Business, Oman

In contrast, a great number of the participants expressed their pride related to the university based on its use of the admin-avatar on its website. For example, the addition of this feature would increase Zul's respect for the university. Ahmad also believed that the university would deserve his respect if the admin-avatar was successful in doing its tasks. Furthermore, Rahaf appreciated the new three-dimensional technology which led to her pride, and she expected other students to also be proud because using this kind of advanced technology produces high levels of esteem for the university.

*It can increase the respect.*

Zul, Male, PhD: Marketing, Indonesia

*If it is a good, high-tech avatar, that university deserves my respect.*

Ahmad, Male, Bachelor: English literature, Brunei

*Students might feel proud to join the university as if they are joining a three-dimensional world. Using this technology gives high esteem attitudes.*

Rahaf, Female, PhD: Systems studies, Oman

For Élise, adding the admin-avatar would make her proud to join the university, especially among her friends. Qadir believed that he would certainly be proud of being a student at the university because the university would be the first one to add and launch this kind of advanced technology. He would also tell his friends about it (a kind of word of mouth that will be discussed later in this chapter).

*It is something I can share with my friends: 'Ah! Look at my university, they have something good on the website. Look at it!' Yes I think I would be proud of this.*

Élise, Female, MSc: Financial management, France

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*I feel good having new technology on the website and would feel big pride. Yeah, we are the first university to launch it and the only university with an admin-avatar on it. That will be a kind of prideful moment for me. I can tell my friends exactly.*

Qadir, Male, Bachelor: Accounting, Pakistan

Shu certainly would be proud because of this addition. She argued that she is proud by any achievement made by her university. She gave an example that, even when she was not a student in the chemistry department, she was proud of its achievements.

*I would be proud. Like the crystal screen, something like that, in the chemistry department — I'm really proud about that even though I'm not in that department.*

Shu, Female, PhD: Finance, China

The literature review found a lack of studies examining the avatar's influence on users' pride as there was no study examining this effect or similar concepts on users' pride was found. The next sub section will address the attitude toward university as a brand, especially three main aspects brand image, modernity and brand recall.

#### 7.2.2.2 Attitude toward university

Attitude towards the university indicates the degree to which a student believes that the university, after adding the admin-avatar, has a good image, is modern and is easy to recall. In general, Shu believed that adding the admin-avatar gave a good attitude towards the university, but most students focus on the university's rank as an important element of developing attitude. In contrast, Ahmad said that if the admin-avatar is poor, it would negatively impact students' attitudes towards the university. Qadir concluded that the addition of an admin-avatar might give a negative impression of reducing the direct contact between students and university members.

*It will make the university good, getting better, but I think most students' perceptions about universities are from like times and some ranks.*

Shu, Female, PhD: Finance, China

*If it is poorly done...the student feels that they are not taken seriously.*

Ahmad, Male, Bachelor: English literature, Brunei

*It would be a negative thing that they do not want the University of Hull students to use the admin-avatar to contact staff members.*

Qadir, Male, Bachelor: Accounting, Pakistan

Yet Samuel explained that his attitude towards the university would not be impacted because of the use of the admin-avatar.

*I do not think listening to the admin-avatar changes and/or affects my attitude towards the university.*

Samuel, Male, PhD: Media, Nigeria

Some previous studies confirmed the influence of the avatar on the attitude towards brand. For example, the impact of avatars on attitude towards the brand mediated by the avatar's likeability, websites' entertainment value and the informativeness variables has been confirmed (Holzwarth et al., 2006). Research has also indicated that consumers who interacted with a sales agent avatar had a more favourable attitude towards the product than those who did not (Hansen, 2009; Holzwarth et al., 2006). All users who listened to the advertisement conveyed by an Apple spokes-avatar showed significantly higher mean scores for the attitude towards the product measure compared with before (Jin & Bolebruch, 2009). The literature review found a lack of studies examining the avatar's influence on users' perception related to the novelty as there was no study examining this effect or similar concepts on users' pride was found. The next sub section will address the brand image as the first aspect of the attitude towards brand.

#### 7.2.2.2.1 Brand image

Brand image refers to the degree to which the student views the university. In other words, it is the perceived image of the university in the student's head. For Tauseef, the addition of the admin-avatar to the university website would contribute to his image of the university's facilities. Other participants mentioned that adding the admin-avatar would give them an impression of a good university which is well known, has an expert educational environment and high quality academic services as well as ways of thinking.

*The avatar gives a quick glance of the university and its facilities.*

Tauseef, Male, PhD: Finance, Pakistan

*I think it is new which makes the University of Hull more famous, good — better known than other universities. I think something new which no one*

*has done before, Hull being the first one, is good. ... The workplace environment has some very good experts.*

Shu, Female, PhD: Finance, China

*My expectation is going to be very high in terms of quality of academic services and teaching methods and way of thinking.*

Rahaf, Female, PhD: Systems studies, Oman

Élise said that the university is considered to be an advanced university which works in a professional way. Such an addition would give her the impression that the university is very organised in its work and might be one of the leading universities. Therefore, the addition of an admin-avatar positively changes students' attitudes towards the university.

*I just say the university is advanced and they are professional. ... The university is very organised and it is a good university and maybe a leading university. ... Students at the University of Hull could change their attitudes about having easier access to the information they need.*

Élise, Female, MSc: Financial management, France

For Biming, the addition of an admin-avatar would give him an impression that the university is effective and has a professional educational system and great facilities. Similarly, Abdul-Aziz would feel that the university is developed because such significant changes add efficient ways for providing information to customers, such as students.

*The voice from me avatar made me feel like it is an effective university in terms of their teaching and their facilities.*

Biming, Male, Bachelor: Business, China

*I possibly feel that they are attempting to try something new or a more efficient way of getting information to people. I feel that the university is developed.*

Abdul-Aziz, Male, Bachelor: Engineering, Saudi Arabia

The university's image for Matthew was that the university has a strong computer science department able to implement such an advanced idea. It makes the university, particularly its website, different. Similarly, Khulood explained that the university must have some different advantages compared to other universities.

*I would think that Hull University has a strong computer science department which is very good because I have not seen any other university website with something like this, so I think it is cool.*

Matthew, Male, Bachelor: Biomedical, UK

*I would think, 'Wow! That is interesting. This university must contain something' — I mean different than others.*

Khulood, Female, PhD: Accounting, Oman

The first impression for Naveed was that the university is a lively, enjoyable, professional place, making it a perfect place for studying and living. In addition, Talha perceived the university to be an attractive and friendly environment for students because the admin-avatar's speaking feature creates a feeling of friendliness.

*It immediately builds my perception that the institute is a very lively, enjoyable, professional and perfect place to study and live.*

Naveed, Male, PhD: Supply chain, Pakistan

*If the University of Hull is doing something unique that will attract many people to come there...the university is very friendly in terms of students, environment and so on. Therefore, the admin-avatar will increase that friendliness because the spoken interaction is always much better than reading.*

Talha, Male, MSc: Business, Oman

For Ralf, the addition of an admin-avatar gave him an impression that university employees are professional and hard workers. They work in order to find new ideas from time to time. Thus, the university is considered a helpful university.

*I think it is an innovative thing, so people sitting there are not like sleeping. I think they are working on something new, they put out new ideas. They have high levels of management ... I would say that the University of Hull is helpful.*

Ralf, Male, Bachelor: Management, Germany

Finally, Delia's university image was that the admin-avatar idea resulted from great marketing activities. She believed that the admin-avatar was a fun way to represent the brand or the university because it made her excited. In addition, she believed that the university had an entrepreneurial culture which helps it compete with other universities.

*I feel very positive because I'm thinking somebody there who is doing marketing who might help the organisation or help another organisation as a marketing consultant — something like this is really fun to represent the brand image probably, so I just get lots and lots possibilities and it makes me very excited. ... It gives me the impression that it would be quite an entrepreneurial culture here and that is what you would want in the business school. You would want an entrepreneurial sort of culture.*

Delia, Female, PhD: Marketing, UK

As this sub section addressed the brand image, the next sub section will address the brand modernity as another aspect of the attitude towards brand.

## 7.2.2.2.2 Brand modernity

Brand modernity indicates the student's perceptions that the university follows new approaches or strategies, making it a modern university. For example, Delia imagined that, if she was a potential student applying to the university, adding an admin-avatar would give her new feelings about the university being a modern place to study. She would perceive the employees behind this addition to be innovative and expressing new and useful ideas, such as this admin-avatar. Arun also believed that the presence of the admin-avatar on the university website would be an indication of the modernity of the university, demonstrating that it adopts innovative ideas.

*It gives new feelings about it being a modern place if I could imagine being a new student going to the University of Hull, and it would show the impression given to me is positive because it is a modern future, looking like it is professional. ... I would think that the first impression is that employees are allowed to innovate, they are allowed to express ideas. I would imagine it is quite a modern space — modern, useful, dynamic — because they give the impression from [the admin-avatar].*

Delia, Female, PhD: Marketing, UK

*A university with an avatar on its website gives me the idea of a modern university, the idea of an innovative university, the idea of a friendly university, the idea of a user-/customer-oriented university, and the idea of straight/direct to the point.*

Arun, Male, PhD: Systems studies, India

Supporting Delia's point of view, Jamaan believed that the university employees, particularly those responsible for the admin-avatar, are highly trained and knowledgeable. They make the nature of work there focused on electronic or 'less paperwork'.

*I believe that there is a training behind this kind of strategy. ... I think that they achieve a high level of knowledge.... It should be less paperwork, for example, because they may adopt digital tools.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

According Qadir, the university is a very modern facility adopting the latest technology, such as an admin-avatar, which is not common among universities. The university is aware of the dramatic changes in technology and improves its website using recent and useful technologies. This indicates not only the university's modernity, but also its flexibility in terms of technology and accepting changing thought. Supporting Qadir's point of view,



Hong believed that the university adopted modernity by investing in information technology. Rahaf believed that the university developed a technological university offering different tools to provide information to students.

*The University of Hull seems like a very modern facility, having an admin-avatar which is not common in many universities. That will like give complete uniqueness to the university website and university itself. ... Having an admin-avatar which makes visitors more aware of technology and trying to improve the website by adding new technology—it is like I can understand the fact of more adaptable flexibility with the technology, making new changes and accepting new changes.*

Qadir, Male, Bachelor: Accounting, Pakistan

*I think the institution likes to invest in terms of IT.*

Hong, Male, Bachelor: Accounting, China

*Smarter, highly developed technological university that I would sure consider going. It offers applicants more than one way to get more information about university services.*

Rahaf, Female, PhD: Systems studies, Oman

Srin, after seeing the admin-avatar, believed that the university had introduced new features to help it survive and continue in the face of competition. Therefore, it should be modern and innovative, achieving high levels of student satisfaction. This requires finding new inventions and promotional tools from time to time.

*They are introducing new features which means they are looking forward to change and which means it is a good sign, actually, for survival. Definitely they are looking for change, bringing on exciting features; definitely they are looking for more and more customer satisfaction and they plan to build a strong customer base ... I can clearly say that they are concerned about the competition and bringing on innovative branding and promotion tools if they are a company.*

Srin, Male, PhD: Finance, India

The brand recall as last aspect of the attitude towards brand will be addressed in the next sub section.

#### 7.2.2.2.3 Brand recall

Brand recall indicates the extent of users remembering the university name when they find an admin-avatar on other universities' or organisations' websites. Some participants, especially those who encountered the admin-avatar for the first time during this interview, emphasised that they would remember the University of Hull when they saw other admin-

avatars on other websites. Shu said she would remember the University of Hull as she watched the first admin-avatar talking to people about the university. In addition, Khulood emphasised that many people would remember the university because it was an initiative in putting this kind of technology on its website. Zul would be sure to recall the university because he remembered other organisations using avatars on websites.

*I will remember if Hull used the first avatar to talk other people, oh!*

Shu, Female, PhD: Finance, China

*Many people will remember the university very well because of that. I mean it will be the initiative to take that step for what, in terms like that, so that is the benefit, the obvious thing, and it will be trademarked for the university's use.*

Khulood, Female, PhD: Accounting, Oman

*I will remember, 'oh!' For example, when I see the admin-avatar, I will say the Yorkshire has an avatar to talk about that, ah when I see other avatars, I will remember the avatar from HUBS.*

Zul, Male, PhD: Marketing, Indonesia

Talha said that he sometimes recalls the place or organisation which initiated the use of advanced technology in providing its products or services. However, Ralf explained that he too recalls organisations which use new tools, but just in the short term. He would have difficulties remembering what an organisation did after some years. According to Srin, his recall of the university would depend on the degree to which other organisations or universities use this tool. If the university is the only one or a few other universities use this tool, he would remember that his university initiated the creation of an admin-avatar. In addition, if his university included unique features in the admin-avatar, it would help him recall the university if others used the admin-avatar on their websites.

*I sometimes remember the first things and the admin-avatar is something new for me so I will remember where I saw this technology the first time.*

Talha, Male, MSc: Business, Oman

*It depends on the time between it. Like if it six months after, I do not think I will remember or something like that, but if it is like I saw it two or three weeks ago and I go to another website with the same system, I would remember I saw it the first time on the University of Hull website.*

Ralf, Male, Bachelor: Management, Germany

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*It depends on if I am seeing the admin-avatar everywhere. In that case, I cannot remember where I have seen it, but if there is a unique feature of the university, definitely I'll remember.*

Srin, Male, PhD: Finance, India

Adding the admin-avatar would help some participants recall the university's website. Matthew found using the admin-avatar to be easy and producing a kind of fun compared to other universities' websites which do not have these. Thus, the admin-avatar can help users to remember the university's website. Élise explained that if she deals with any admin-avatar, she will remember the university website because she considers it like a person she talked to and does not forget anyone she meets. Similarly, Delia would remember the university's website because of the admin-avatar, which looks very much like a real person.

*I think it is easy and more fun to use an admin-avatar because this website has it and other websites do not have it, so I will remember the website when I go on [another] and say 'oh that website has an admin-avatar, it speaks too and this thing is cool'.*

Matthew, Male, Bachelor: Biomedical, UK

*I will remember when an admin-avatar speaks to me. I will say, 'yes, I saw an avatar on other website, in Ikea, yes'. It is something that I remember because it is like a person. I cannot forget a person who I've met. You meet a person, so you cannot forget him/her. So, it is like I met a person and I spoke with her, so I cannot forget her.*

Élise, Female, MSc: Financial management, France

*I think I will remember people more than I will remember the website. She is a person, so I will probably remember her face.*

Delia, Female, PhD: Marketing, UK

The literature (see Chapter Four) did not include any results with relation to the impact of avatars or a similar concept on brand image, brand modernity or brand recall. The next sub section will address the student orientation as the third attitudinal consequence related to the brand.

### 7.2.2.3 Student orientation

Student orientation indicates the degree to which the university thinks of and implements ideas to satisfy students' needs. Alyan believed that the university investigates new ideas which are good for students and implements them. According to Zul, the university cares

about students' needs, particularly in terms of providing information. Therefore, the university improves its technology to offer easier methods for providing information to students.

*It will be confirmed as I am looking for students. It confirms the idea that they try to provide something new, something good for students.*

Alyan, Male, MSc: Education, Saudi Arabia

*They care about how to give information to students, but not for all because we have another indicator for the performance of the university: how to give services to students. The University of Hull improves its technology to serve the students ... The University of Hull increases its technology to use this to become more communicable to give information to students.*

Zul, Male, PhD: Marketing, Indonesia

Élise perceived the addition of an admin-avatar on the university website as the university's attempt to guess students' ideas before they ask for them. Khulood also perceived adding the admin-avatar to be a kind of improving the technology by looking for new methods to satisfy students' needs. These initiatives, in turn, would change students' thoughts of the university.

*It is like the university is trying to guess if I need something before I ask for it.*

Élise, Female, MSc: Financial management, France

*If the university applies such technology or other things, it means the university is looking for how to satisfy their consumers' needs, especially as they will know why they have been doing such thing others have not done. They are looking to satisfy their consumers' needs like that ... that the university is looking for how to have good students or their best to serve the students' needs since they have that initiative of technical things. It will make the university, in the consumers' eyes, very different, unique and they will look for how to get into that university.*

Khulood, Female, PhD: Accounting, Oman

The literature review found a lack of studies examining the avatar's influence on users' perception to show whether the brand is consumer oriented or not. The next sub section will address the relationship quality between university and its students, especially three main aspects brand satisfaction, trust and commitment.

### 7.2.2.4 Relationship quality

The qualitative data analysis also identified three constructs related to relationship quality — namely, satisfaction, trust and commitment. These constructs reflect, in line with the literature review, the relationship's goodness between the students or users and the university. Therefore, the three constructs are incorporated into one broader construct reflecting relationship quality. Each construct is discussed separately here.

#### 7.2.2.4.1 Satisfaction

Satisfaction indicates the extent of a person's satisfaction with the university after adding the admin-avatar. In general, some interviewees expressed their happiness because of the addition of the admin-avatar. For example, Chao felt positive and happy because he could get the information in a different format from the admin-avatar.

*I feel happy and positive to access and get information from the admin-avatar.*

Chao, Male, PhD: Engineering, China

Other interviewees have declared that a number of factors affect satisfaction with the university. For instance, Arun said that his satisfaction would increase if the admin-avatar gave him a short message or answer, which he described as 'personal content'. This means that the admin-avatar's messages should be specific, short, and focused on a narrow topic. For Delia, although she prefers to receive the information in a written style, she would be happier after receiving the needed or required information from the admin-avatar.

*It is nice to listen to an admin-avatar, but that depends on many factors: what kind of information is sought/delivered? If it is short and a message is apparently personal in content, I think the avatar would satisfy me more.*

Arun, Male, PhD: Systems studies, India

*Although I would prefer to read the information in text form, if it is only available from the avatar then I will be happy to listen to it. After listening, if I find the required information, I can imagine I would be happier.*

Delia, Female, PhD: Marketing, UK

For Jamaan, in addition to receiving all of the needed information, a live admin-avatar which gives him information and responses would immediately increase his satisfaction with the

university because he would consider it as online communication between the university and its students.

*I think I would be satisfied if it gives me a full answer about what I need.... I am satisfied with the University of Hull as a brand because it gives me that, especially as I said there is an online communication.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

Zul believed that improving the admin-avatar to be more attractive and combining it with other tools (e.g., videos and maps) would increase his satisfaction. However, the admin-avatar is only one factor for increasing his satisfaction. In other words, his satisfaction is built based on many factors, and his admin-avatar is only one of them. Other factors include the educational services provided by the university and the number or type of these services (scholarships, courses, conferences, etc.).

*I'm satisfied but they have to improve this avatar to make the avatar more attractive and give information and combine with other tools...I think the admin-avatar can increase satisfaction for me, but it is not the only factor.... I cannot say using the admin-avatar will make me fully satisfied. I can be satisfied when I got service here, got information anything from the university based on the services, not only the avatar.*

Zul, Male, PhD: Marketing, Indonesia

Talha discussed his satisfaction based on several to some reasons. He is interested in new technology and would be happy and satisfied to see the admin-avatar. He believed that the admin-avatar might play a positive role in his ability to understand information quickly and directly. Furthermore, Élise believed that the admin-avatar would increase her satisfaction because she would consider it free help or a service provided by the university. Her satisfaction is also based on the belief that the university tries to offer new supportive tools for its students. These results support the previous research in which showed that the affective connections or relationships between users and interface characters were established by both the character's visual appearance and the affordances it offers (van Vugt et al., 2006).

*If they provide the information that shows it clearly, I think yes ... But about me I think I am one who is interested if the technology is supporting my understanding. So if the admin-avatar gives me the information that I*

*need in a short time and in a direct way, I think it is much better than reading. So my satisfaction will be increased and I will be happy.*

Talha, Male, MSc: Business, Oman

*When I go to the website, they give me free help or I do not ask for it, so it is like I do not ask for something that I need but they give it. Like the university is trying to guess my needs. So my satisfaction is yes.*

Élise, Female, MSc: Financial management, France

For Hamdan, satisfaction stems from the admin-avatar being a new not used on any other university website. Therefore, he can consider it as a source of happiness while talking with his friends. In other words, the admin-avatar is an advantage for him and other students in his university. Ralf believed that his happiness with the admin-avatar occurs just in the beginning, but he considers it as any new tool the universities provide. Therefore, his satisfaction would not be impacted by the admin-avatar.

*Simply I will be happy because, simply, this is for example a new idea and when I talk to my friends anywhere, they will say 'we do not have this one' or 'we have this good characteristic'. So now this gives our website an advantage to talk to people but we have this thing and I think it is good idea.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

*Maybe you know I use it, maybe the first time, I would be like laughing because it makes me happy the first time hearing a voice, but if I get used to it, it will be the norm, it is not satisfying me more than reading.*

Ralf, Male, Bachelor: Management, Germany

Most of the qualitative results related to satisfaction are in line with the avatar literature. A number of previous studies have demonstrated that an avatar-enabled user interface provides more improved values for consumer satisfaction than traditional shopping (Holzwarth et al., 2006; Lee & Chung, 2005). The use intention of virtual characters and the involvement with them had significant contributions to end-users' satisfaction (van Vugt et al., 2006). In other words, the presence of an avatar makes users feel satisfied from the interface (Neviarouskay et al., 2010). The next sub section will address trust as a second aspect related to the relationship quality.

#### 7.2.2.4.2 Trust

Trust refers to the student's belief that the university is reliable and trustworthy. With respect to trust, the interviewees' points of view varied. Some considered adding an admin-avatar to play a crucial role in increasing the trust in the university. For instance, Talha said that an admin-avatar could increase her trust in the university because it simulates face-to-face communication, particularly in the case of using pictures of real persons in the university, such as the dean or vice chancellor. Ivan believed that the addition of an admin-avatar would increase his feelings towards the university as technologically reliable, thereby creating a positive attitude towards the university. Trust has been extensively examined in the avatar literature. Several research streams have been developing, particularly in terms of trust in avatars (Riedl et al., 2010). The previous research showed that avatars' social interaction cues increase trust in online shopping sites (Keeling et al., 2010).

*I think it could increase trust because I see someone, I see a face, I see a human. I will not just see text and boxes, so I see someone and that someone could give me that trust, especially if that person — the dean, for example, I saw the dean here speaking through the admin-avatar — that might also, now it becomes more trustworthy.*

Talha, Male, MSc: Business, Oman

*Since I feel that the university is more reliable towards technology, using and developing its services, which gave me a good impression to favourite the university.*

Ivan, Male, PhD: Finance, Bulgaria

The professionalism of the admin-avatar also plays an important role in developing trust. Élise could trust the university because the female admin-avatar looked like an expert in the admission field. Previous studies supported this view that interactions with avatars could enhance users' trust of the technology used (Cassell, 2000; Cassell & Bickmore, 2000). The presence of avatars and/or virtual salespersons facilitates the development of trust (Komiak et al., 2005; Morrison et al., 2012) as they provide a reliable visual representation (Bogdanov et al., 2013; Sanchez & Garcia-Rodicio, 2008). Human-like characters are perceived as more trustworthy than cartoon-like characters (Luo et al., 2006). Adding avatars can help companies personalise interactions with consumers, reducing the



impersonal limitations of websites' interfaces in which trust might be increased (MacKenzie et al., 2013).

*I could trust the university because she [the admin-avatar] looks like a professional.*

Élise, Female, MSc: Financial management, France

In contrast, other interviewees did not believe that the addition of the admin-avatar would affect trust in the university. Shu believed that adding an admin-avatar does not completely relate to trust in the university. According to Qadir, trust in the university mainly depends on the factors which are different from the admin-avatar, such as the faculty staff. He believed that technology in general can improve trust in the university, but not as significantly as other factors.

*It is unrelated to trust.*

Shu, Female, PhD: Finance, China

*Not really because it depends on the faculty members and staff like that, but again, adding an admin-avatar makes it attractive, not trustworthy. I would not say that, but on the same side technology can improve trustworthiness. I will not put 100% of my trust in the admin-avatar.*

Qadir, Male, Bachelor: Accounting, Pakistan

Likewise, Srin doubted that adding an admin-avatar to the website would lead to a high degree of trust. He believed that it is just a marketing tool for the brand, which might be useful or not. He also believed that he could decide whether there would be an improvement in the trust or not after using it on the actual website. This is because the information used by the admin-avatar during the interview was still too limited to make a decision about trust.

*I cannot say that having an admin-avatar makes the brand more trustworthy. It helps the brand to be promoted or marketed in a better way. So I cannot decide on the trust because trust depends on when I use the product, and I develop the trust before using the product, how I can determine the trustworthiness?!*

Srin, Male, PhD: Finance, India

The next sub section will address the consumer commitment towards university/brand as the last aspect of the relationship quality.

## 7.2.2.4.3 Commitment

Commitment indicates the degree to which the student has the desire to continue and maintain it in the future. Talha expected this kind of recent technology to motivate potential students to start university because it gives them positive indications about the university. Similarly, Delia asserted that she would be committed to continuing with the university because it reflects the quality of services provided there. In addition, it gives an impression that the university offers a greater experience than other universities. Therefore, it would most likely be on the short list of initial choices.

*I think because those people who did not come to the university yet, these types of technology will attract them to come. These are good indications for them, good indications about the university, that it has the latest technology and so on. It might keep a real image about what they have there, even about the people who they are going to meet.*

Talha, Male, MSc: Business, Oman

*When I apply for university, for course, anything that can help the university stand out and reflect the quality of services — and these are modern principles — I think it is very positive ... when I come down to my short list, Hull will probably come in on the short list because it is really cool. I would expect the university just instead of the better experience because they give me a better first impression and I would expect my experience university to be better than other universities.*

Delia, Female, PhD: Marketing, UK

Yet Qadir believed that the admin-avatar did not provide a significant reason for continuing at the university. Other important factors, rather than adding an admin-avatar, would indicate whether he would continue with the university or not, such as faculty members, offered services and its reputation. Likewise, Zul said he committed to the university, but not because of the adding of an admin-avatar.

*Adding an admin-avatar to the website does make it attractive, but to be committed to university depends on the faculty members, the kind of services they offer to students, the career part and the reputation of the university — that is commitment to university.*

Qadir, Male, Bachelor: Accounting, Pakistan

*I will be committed to continue my study here but not only because of the admin-avatar.*

Zul, Male, PhD: Marketing, Indonesia

### 7.3 Behavioural consequences of using admin-avatar

This section addresses the behaviours which can be formed or result from using an admin-avatar. The participants' reactions varied about the extent to which the admin-avatar influenced their behaviours. Moukhled emphasised that the changes in his behaviours stemmed from dealing with the admin-avatar as a real human. However, he believed that these changes could be either positive or negative. This means that the presence of the admin-avatar often negatively or positively changed users' behaviours based on other factors such as the information provided.

*My behaviours were changed by providing the information via voice/sound more than text as it deals with human behaviour. However, this impact could be positive or negative.*

Moukhled, Male, PhD: Supply chain, Saudi Arabia

In contrast, Carlos said during the interview that using the admin-avatar did not affect his behaviours at least during conducting the interview with him. His belief can be interpreted from different aspects. First, the admin-avatar was a new tool for him, so he might not have expected changes in his behaviours. Second, the short presentation of the admin-avatar during the interview might not have helped him predict the influence of or changes in his behaviours.

*But I do not think my behaviour — at least in a first moment — could be affected by it.*

Carlos, Male, PhD: Management, Mexico

For Tauseef, the admin-avatar did not influence his behaviours, particularly in terms of the university, as it was not an important or key factor in choosing the university. Other factors affected his decision, such as the available research interests in the university and the information provided.

*I do not think an avatar can affect behaviour towards an institution like a university. My decision to choose a university rests on the fact what the university is offering in terms of my research interests, the information provided (e.g., through an avatar or the form of text).*

Tauseef, Male, PhD: Finance, Pakistan

These opinions and beliefs suggest that there is no agreement concerning the impact of the admin-avatar on the visitors' or users' behaviours. From the qualitative data, three main constructs emerged — namely, the potential for the student to join, the student's voluntary behaviours and the propensity to leave.

### 7.3.1 Potential to join

The presence of the admin-avatar can encourage the users to apply and join the university. A number of previous studies have shown that an avatar-enabled user interface leads to high purchase intention in online shopping (Holzwarth et al., 2006; Lee & Chung, 2005). Matthew believed that adding the admin-avatar would help users get the information easily. It would, thus, motivate people to apply and join the university. Emphasising this point of view, Olivia expected adding the admin-avatar could increase the chance of a student to join and study at the University of Hull. Similarly, Abdul-Aziz imagined that, if he found the admin-avatar on the university's website, he would like to engage this university. These three points of view reflect the influence of adding the admin-avatar on the users' decisions to join the university. These point of views are in line with the results of spokesperson cartoon advertisement presence can increase purchase intention for a brand (Heiser et al., 2008).

*If with the University of Hull it is easy to get information — and I think the admin-avatar does make it easier — then I think people will apply. It just makes everything easier, does not it?! Like you could be writing something and just press play and just listen to it, it is just reading the monitor, it is just easier to multitask.*

Matthew, Male, Bachelor: Biomedical, UK

*My behaviour might be impacted by increasing my research about the opportunities to study at University of Hull.*

Olivia, Female, PhD: Systems studies, USA

*I would like to engage this university.*

Abdul-Aziz, Male, Bachelor: Engineering, Saudi Arabia

Alyan believed that the students would join the university after seeing the admin-avatar because using the new technology on the website would give them a positive indication

about the university. In addition, this kind of technology would be easy to use and make them comfortable, in turn satisfying them in receiving the information from the university. These results support the previous research which confirmed that informativeness and avatar likeability variables mediate the impact of avatars on purchase intention (Holzwarth et al., 2006). Furthermore, when avatars look like the consumers' characteristics, they produce a high brand attitude and purchase intention (Ahn & Bailenson, 2011).

*The students will say if this is comfortable and satisfied this will be provided new with this tool so that it will make it easier for them. I think if students believe that it is good and they are satisfied with this tool, they will come to the University of Hull to study there to see how to use technology on the website. They use it in a new way on the website.*

Alyan, Male MSc: Education, Saudi Arabia

Contrary to the previous views, Srin asserted that the information itself rather than the medium used ultimately determined which university he would join. This means that the medium used to provide information does not represent significance to him as far as the quality of available information.

*Finally the information is more important than the medium. If I find the information relevant enough to my requirements, I may consider the university as a potential applicant but definitely, if the information is not relevant I will not change my mind due to the presentation of information.... I have to make the decision based upon the quality of information.*

Srin, Male, PhD: Finance, India

Holzwarth et al. (2006) confirmed the influence of avatars on the perceived informativeness variables and, in turn, on consumers' satisfaction with the retailers, attitude towards the product, and purchase intention. These results are critical for the current research for several reasons. First, the applied contexts are very similar. Holzwarth et al. studied online purchases on a retailer's website while the current research examined the admin-avatar on a brand website. In other words, neither study examined the avatar in the virtual world. Second, the roles of the agent avatar in Holzwarth et al.'s study were similar to those of the admin-avatar in the current research. Finally, in Holzwarth et al.'s study, informativeness

played a mediating role between the avatar and the three construct outcomes (i.e., consumer satisfaction with the retailers, attitude towards the product and purchase intention). These three outcomes also emerged in the qualitative phase of the current research and will be discussed later. All three constructs were included as consequences of the informativeness in the taxonomy of the current research. Therefore, it can be argued that Holzwarth et al.'s (2006) study supported the assumptions of qualitative phase of the current research with respect to the directions of the relationships of these constructs. The next sub section will address the voluntary behaviours that can be raised because of adding the admin-avatar on the brand website.

### 7.3.2 Student voluntary behaviours

The student's voluntary behaviours construct indicates the behaviours of the student when favouring the university without any kind of obligation. These behaviours are divided into three types: word of mouth, feedback and recommendation.

#### 7.3.2.1 Word of mouth (WOM)

The analysis of the qualitative data found that adding the admin-avatar motivated users to talk positively or negatively about the university. Ahmad said he would tell his friends and relatives to check the admin-avatar if properly created. In contrast, if the university fails to create the admin-avatar properly, he believes that it would be an object of mockery and would thus talk negatively about the university. Similarly, Jamaan said he would start telling his friends about the admin-avatar once he perceives it to be a useful tool.

*I would certainly tell my friends and family to check it out. On the other hand, if it were poorly done it ... it would be an object of mockery.*

Ahmad, Male, Bachelor: English literature, Brunei

*I believe that if I get useful information from the avatar, I will tell my friends about it.*

Jamaan, Male, PhD: Accounting, Saudi Arabia

Supporting the view of saying positive words about the university, Élise would tell her friends about the university if she found that the admin-avatar said positive words due to this addition. Although she could not predict her friends' responses, she believed that the admin-avatar would make the university different and famous for using this new tool. Likewise, Zul expected to talk positively about the university to his friends, particularly potential students for MScs and PhD programmes.

*When I speak with my friends, saying it is a very good and big university, they have an admin-avatar on the website. ... It is new and I do not know if students would like to be in a university which makes something different. We like to be in a good university, a different university, so something like that it is, 'Oh! My university has an avatar and is very famous'.*

Élise, Female, MSc: Financial management, France

*I will say something positive about the university to other persons who will take a master's or PhD degree or bachelor's degree here.*

Zul, Male, PhD: Marketing, Indonesia

According to Khulood, if she discovered that the university published something new, she would send it to her friends to show its uniqueness compared to other universities' websites. She would feel proud of this addition. She gave an example that links her pride, university recall and positive words. As she feels pride, she would not forget that the first time she saw the admin-avatar was at her university. Therefore, she would defend her university's initiative.

*I would like, if I find the avatar and it is really used on the website, I would just immediately send this news or tell others, like I found something different from the other websites. It would make me proud because I'd say, 'yes, my university is the first university which uses an avatar' and if other universities have used it. ... Hull University started using so it I would be very proud to say that to others.*

Khulood, Female, PhD: Accounting, Oman

Adding proper and useful features such as an admin-avatar to the university website would be expected to help spread positive words about the university through its students. In other words, adding the admin-avatar can enhance the positive word of mouth. Yet negative word of mouth can also emerge if the features are useless, helpless or not appropriate to use.

Existing literature has not examined avatars' influence on word of mouth, although the need for further examination to empirically investigate the impact of avatars on marketing consequences (e.g., passive word of mouth intention) has been identified (Garnier & Poncin, 2013). The next sub section will address the feedback as the second voluntary behaviour in this research.

### 7.3.2.2 Feedback

Giving feedback is another type of student behaviour that can help the university enhance its services. The qualitative data analysis demonstrated students' thoughts about giving feedback. One group of participants linked feedback to the ability to share such feedback from the website. Hamdan provides feedback when asked to do so via a feedback section. In addition to the presence of a feedback section, Matthew gives feedback when he has free time.

*Yes, if they want my feedback they have to use, for example, a way to tell me I could give feedback .... I will give my feedback and I will be happy to do so, but they have to ask me something to do.*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

*If there is a feedback section on the website, I could write feedback; like some websites have a feedback section and the people just send feedback opinions. If I find it, I guess if I have time, I would be pleased to give some useful feedback.*

Matthew, Male, Bachelor: Biomedical, UK

In addition, Zul said he would provide feedback if he finds a section for comments or suggestions, such as forum. For Élise, there are two conditions when she would provide feedback: opening a window beside the admin-avatar and asking for users' feedback.

*I think, for example, if I find there any comments for that, any forum to give information or suggestions, I will write that.*

Zul, Male, PhD: Marketing, Indonesia

*I can if they ask for that, but if there is no any space for that ... if the admin-avatar opens a window and says 'please write your feedback'.*

Élise, Female, MSc: Financial management, France



Furthermore, the way of presenting or asking for feedback determines whether the participant would give feedback or not. According to Ralf, he does not expect to give feedback as he is lazy to do so, but if some questions are asked with multiple answers, he would give his feedback. Alyan emphasised Ralf point, saying he would give feedback if the feedback section was delivered or presented easily.

*I will not give them feedback if there is, like, in the end, maybe how I will do it, maybe because it is, like, if at the end of the session or something like that. I hear the voice of feedback, like somebody is telling me the questions. And, I have to click yes, no, yes, no, yes, no — maybe I will do it because I am lazy. I do not like give feedback on my own.*

Ralf, Male, Bachelor: Management, Germany

*If I find an easy way to tell them about my opinion, like chatting or like if they ask students a questionnaire to ask me, I will tell them about my opinion and try to find a way to let him about what would benefit them by changing something in this tool.*

Alyan, MSc: Education, Saudi Arabia

As these comments demonstrate, the participants are not willing to initiate feedback on their own. They need the university to motivate them first to give feedback. In contrast, Talha explained that it is necessary to give both positive and negative feedback because it helps improve the provided services, particularly the admin-avatar service. Supporting this view, Qadir stressed the need to give feedback; he expects his feedback would focus on the need to provide material to explain how the admin-avatar works. In addition, he would advise giving enough time during induction week to explain the admin-avatar as a communication tool because new students might face some difficulties using it.

*I will give sort of feedback so maybe some things are good, so it could be enhanced, or something may be bad, so the probability of giving advice is high.*

Talha, Male, MSc: Business, Oman

*Definitely, I do feedback. Like as a student I do give feedback on many things in the university, for example ... I think the best way of doing it is adding some poster or staff like that, like the university is introducing some new ways of communication and for example they can leave some guidebooks about how to use the admin-avatar ... Moreover, when I was new in the university, the first induction day they gave me training about*

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*how to use library facilities; in that training they can add how to use the admin-avatar.*

Qadir, Male, Bachelor: Accounting, Pakistan

Finally, Shu asserted that she would only give her feedback if she encountered problems while using the admin-avatar. However, if the admin-avatar goes smoothly and clearly, she would not need to write any feedback.

*I will give them feedback if there are any problems, but if the avatar speaks smoothly, I will not give any.... I don't think there are any problems if the avatar smoothly answers the questions clearly.*

Shu, Female, PhD: Finance, China

The next sub section will address the recommendation as the last voluntary behaviour in this research.

### 7.3.2.3 Recommendation

Recommendation indicates the person's advice to others, such as friends, colleagues, family members and/or relatives, to join the university after adding the admin-avatar. Talha believed that the admin-avatar is a new feature for him and most of his friends; thus, he would recommend them to use the university website. Zul would recommend the university because it improves its technology, but he believes that it should also improve other services so he could strongly recommend the university to others. Similarly, Delia expected to recommend the university to others — not because of the admin-avatar, but because its tries to enhance the search process for students.

*I think yes because nowadays it still offers new features, let us say on the website so, sometimes 'oh! Go to the University of Hull, you will see new features. Instead of reading about the university as in others, you could listen, yes'.*

Talha, Male, MSc: Business, Oman

*I think based on this university's efforts to improve its technology, yeah I will recommend that, but for all services it still needs improvement. But I will recommend.*

Zul, Male, PhD: Marketing, Indonesia

*I would not recommend the university, but I would say 'you should have a look at their website. It has got an avatar, it is really cool'. I would not*

*say you must go to University of Hull because Hull actually has tried a product search. If I was a new student, I would say, 'go look at that, you must use the link'.*

Delia, Female, PhD: Marketing, UK

However, a great number of participants believed that the admin-avatar was not a factor which would make them recommend the university to their friends. Ralf did not think that he would recommend the university because of the admin-avatar addition, but he noted that many other significant factors exist which would lead him to make such a recommendation. Qadir also believed that the admin-avatar might influence the university's reputation or attitudes towards the university, but not students' careers, making them recommend it.

*No, because it is not the reason to say okay! There are many other reasons which are more important on the website about whether to go or not.*

Ralf, Male, Bachelor: Management, Germany

*I do not think so because the admin-avatar does not make the career perfect or good. The admin-avatar makes the website good, makes the university reputation good, like how technical and how new, like adding technology or something like that, but it does not make a big difference.*

Qadir, Male, Bachelor: Accounting, Pakistan

For Élise, the admin-avatar is part of the services package the university provides to students. When she recommends the university to others, she mentions other services, such as the sports centre, library and labs.

*When I speak with my friends and say it is a very good and big university, they have ... look at the website and you find the admin-avatar. But not just the admin-avatar because it is a part of a package, yes. It is one factor.*

Élise, Female, MSc: Financial management, France

Students' voluntary behaviours comprise three main behaviours: word of mouth, feedback and recommendations. The students can say positive words about the university because of the admin-avatar addition and give the university advice or feedback, but it is doubtful they will recommend the university based solely on the admin-avatar. The next sub section will address the propensity to leave as the last potential behaviour that students could do it because of adding the admin-avatar.

### 7.3.3 Propensity to leave

The tendency to disuse construct refers to the user's tendency not to use or deal with the admin-avatar, website and/or university itself. Participants' responses reflect the different views of the admin-avatar being a factor for leaving the website or university itself. Hamdan considered the admin-avatar an advantage and wondered about disusing it or the website or even not dealing with the university because of the admin-avatar. Alyan also considered the admin-avatar to be a novel tool and expected to use it, as there is no reason not to.

*No, no, no. Do you think someone will do this? I do not think so. This is an advantage. I do not think someone will leave the university because of this admin-avatar!*

Hamdan, Male, Bachelor: Accounting, Saudi Arabia

*I do not think so. No, for me, I will try to use it and I will hear the voice so it is new for me. Why would I leave it?*

Alyan, Male, MSc: Education, Saudi Arabia

For Zul, the admin-avatar would offer an alternative or getting information, not a key element for leaving the university. He can get the information from other sources, such as texts and friends, and believes that the quality of provided services is one of the main factors determining whether to remain in the university or not.

*I do not think so because beside the information from admin-avatar, I can get more information from the details in the text and I will compare with my friend. I get some information from another person.... No I will not leave the university because maybe I just did not get complete information from there. If I can get detailed information and good services from the members of the university, I will not leave the university.*

Zul, Male, PhD: Marketing, Indonesia

However, Khulood believed that the decision to leave the website would depend on the extent of the admin-avatar in providing the needed information or full answers to the users. In the case of a shortage of information and answers, she would leave the website, as she would perceive it as helpless. Likewise, Delia would leave the website if she encountered difficulties while searching for information. She expected the admin-avatar would give her specific needed information, not just general information about the university or its staff.

*If the persons did not get answers and they did not find any other way, I would think this tool is really unhelpful and just leave the website.... If the admin-avatar did not get full answers to their questions and they did not get the link or I mean the others substitute a question, they just immediately leave the website.*

Khulood, Female, PhD: Accounting, Oman

*If I could not get information easily, I would just leave it. I like the fact that I imagine I would click on to this and she would tell me that each of these are like FAQs. If these are frequently asked questions or whatever, then if I just hear and she is just going on and on ... because I want specific information. ... If she is telling me about the mission and vision about the University of Hull and it is accommodating 24 hours to get talking about professors there, doing this. So, I will say forget it.*

Delia, Female, PhD: Marketing, UK

For Qadir, adding the admin-avatar would not be a reason to leave the website because he accepts and adopts the new and advanced technology. He believes that other students' acceptance of the admin-avatar depends on their abilities in terms of understanding new technology and adopting it. Similarly, Talha said he is interested in new technology, so he would continue using the website with the admin-avatar. He also believed that even if he left the website because of the admin-avatar, he would not leave the university, as that is another issue. Qadir's and Talha's comments demonstrate that the user's personality plays a key role in determining the extent of accepting and adopting the admin-avatar as well as the degree of leaving the website or the university.

*I am a technical person as I always accept and adapt flexibly with new technology. I do learn new things. So it will be much more interesting for me to learn and use the website more often. But it depends on other students' capabilities of understanding technology, the way they accept new technology, the way they adopt it. They might leave it, they might not, but I like it.*

Qadir, Male, Bachelor: Accounting, Pakistan

*For me no, because I am interested in the technology, so I will not leave it because I do not like it. Maybe I will leave the website, but not the university.*

Talha, Male, MSc: Business, Oman

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**7.4 Admin-avatar taxonomy**

This section addresses the taxonomy which emerged from the previous comprehensive discussion of the qualitative data analysis (Chapters Six and Seven). Figure 7.3 shows the taxonomy called ‘admin-avatar tower’. The idea of the admin-avatar tower is summarised in several points. The different aspects of the admin-avatar (e.g., communication, anthropomorphism, admin-avatar efficacy and ease of use) are considered the main base of the admin-avatar tower. The conditions related to the admin-avatar (e.g., language option(s), admin-avatar based on text or not and live or programmed admin-avatar) play vital roles in strengthening the base of the tower. If the base is strong, the probability of building a strong tower is high. The tower is divided into three parts. The first part includes the attitudinal consequences related to the website. The strong presence of this part presumably helps build the second part of the tower. The second part includes the attitudinal consequences related to the university. The presence of the consequences related to the university helps build behaviours towards the university (e.g., potential to join the university, word of mouth and recommendation). These behaviours represent the top of the admin-avatar tower. Finally, some factors influence the link between the base of the tower and the body of the tower, particularly the first part of the body (consequences related to the website). These factors could positively or negatively affect the relationships between the base and body of the tower. It is notable that all these assumptions are based on the qualitative data analysis.

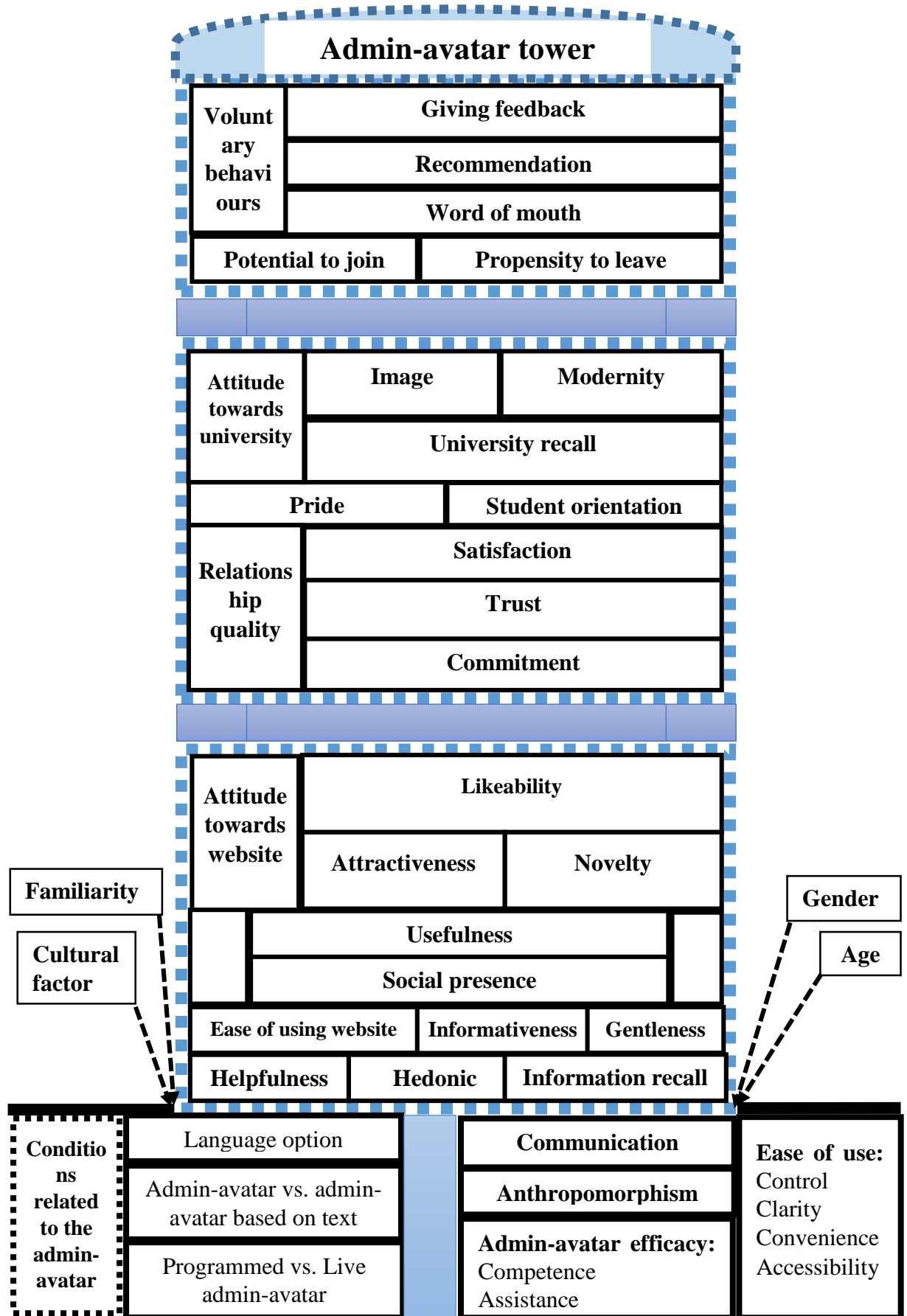


Figure 7. 4 Admin-avatar taxonomy

### **7.5 The conceptual framework**

This section addresses specific constructs from the admin-avatar tower for several reasons. First, the admin-avatar taxonomy includes 41 constructs; it is impossible to study them all at one time. Second, the appropriate quantitative approach, as discussed in Chapter Five, is the experimental design. This means the constructs should be examined through different conditions related to the admin-avatar, but this is also very complicated to examine in one study. Furthermore, the adapted method of the experiments is laboratory experiments; thus, it would be very expensive to include sufficient participants for all these constructs. Therefore, two experimental studies with specific constructs were developed. The majority of the tower base (aspects of the admin-avatar) and the third part of the tower body (behavioural consequences) were considered in one or both of the experimental studies because these areas have fewer constructs (13 total). Some of the attitudinal consequences related to the website and university were also considered.

The balance between diversity and emphasis was taken into consideration when choosing the constructs of the conceptual frameworks. The diversity was considered to examine as many constructs of the admin-avatar taxonomy as possible. The emphasis was considered to achieve the reliability of the results. For example, with regard to the outcomes, the first experimental study included both propensity to leave and potential to join constructs, while the second one included word of mouth, recommendation and feedback (diversity criteria), as shown in Figures 7.4 and 7.5. Furthermore, the aspects of admin-avatar, such as clarity, control and convenience, were included in both studies (emphasis criteria).



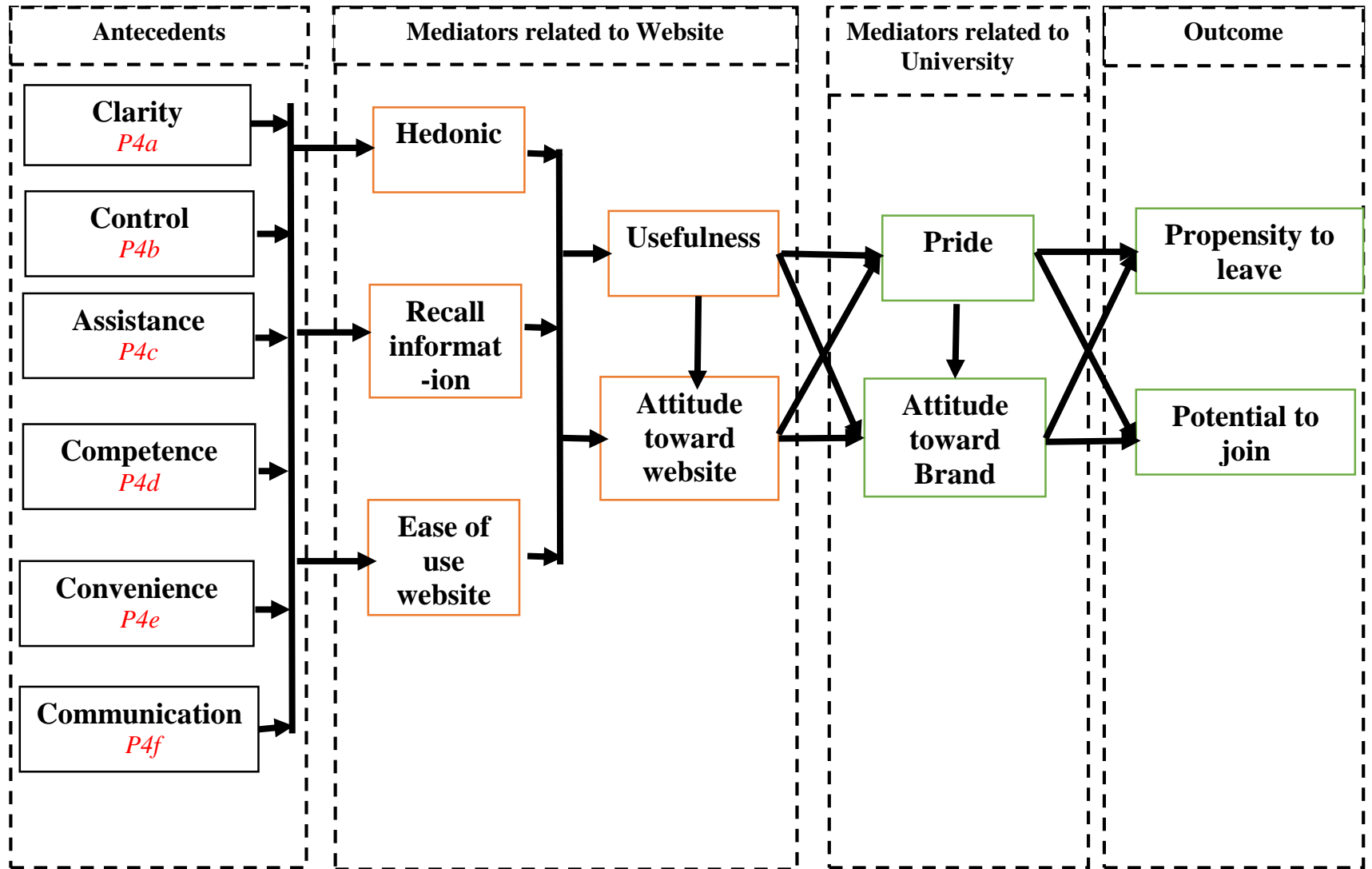


Figure 7.5 Conceptual framework for study one

### ***7.5.1 Conceptual framework of the first experimental design study***

The aim of the first experimental study was to compare the three conditions of providing information to the website visitors (e.g., students). These conditions are the written information style (as a control condition or variable), admin-avatar and admin-avatar based on text (manipulated variables). It also aimed to examine the impact of different aspects (clarity, assistance role, competence, control, convenience and communication) of each condition on the outcomes (propensity to leave and potential to join) mediated by consequences related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and the university (pride and attitude towards the university).

Arranging constructs in this model was done mainly in line with the reasoned action theory (Fishbein & Ajzen, 1975) which provides theoretical guidance for interpreting the relationships among cognition (represented by the admin-avatar aspects in the current research), affection (represented by the attitudinal consequences towards the website and university) and behavioural intention constructs (represented by the outcomes), as shown in Figure 7.4. Figure 7.4 presents the potential to join and propensity to leave as consequences of indirect relationships with the admin-avatar aspects mediated by the attitudinal consequences towards the website and university. Some points should be clearly stated here. The order to which attitudinal consequences related to the website affect the consequences related to the university is based on two main factors. First, the qualitative data analysis showed that, when students positively perceive the website and its components, their attitudinal consequences towards the university are more likely affected. Second, it is logical first to build the perceptions towards the instruments, such as the admin-avatar and website; then the perception towards the owner of the instruments is built based on the perceptions towards the instruments. Furthermore, the consequences related to the website are divided

into two levels. The first level includes hedonic characteristics, recall information and ease of using the website, which presumably influence the second level, including usefulness and attitude towards the website. The literature confirmed the influence of constructs, such as the hedonic characteristics (enjoyment), ease of use and usefulness on attitude (e.g., Davis, 1989; Leng, Lada, & Muhammad, 2011). It is important to note that some direct relationships, such as those between the admin-avatar aspect and usefulness or attitude towards the website, were not considered to simplify the conceptual framework. Therefore, the propositions (P) of this study are:

*P1: The degree of clarity, control, competence, assistance, communication and convenience is more significantly affected by the admin-avatar based on text than on admin-avatar and written information conditions.*

*P2: The students' perception of the consequences related to the website (hedonic characteristics, usefulness, recall information, ease of using the website and attitude towards website) is more significantly affected by the admin-avatar based on text than the admin-avatar and written information conditions.*

*P3: The students' perception of the consequences related to brand (pride, attitude towards brand, potential to join and propensity to leave) is more significantly affected by the admin-avatar based on text than admin-avatar and written information conditions.*

*P4: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the constructs of clarity, control, competence, assistance, communication and convenience and both propensity to leave and potential to join constructs.*

Proposition 4 is divided into six sub-propositions as follow:

*P4a: The constructs related to the website and brand mediate the relationships between the clarity construct and both propensity to leave and potential to join constructs.*

*P4b: The constructs related to the website and brand mediate the relationships between the assistance construct and both potential to join and propensity to leave constructs.*

*P4c: The constructs related to the website and brand mediate the relationships between the control construct and both propensity to leave and potential to join constructs.*

*P4d: The constructs related to the website and brand mediate the relationships between the competence construct and both propensity to leave and potential to join constructs.*

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P4e: *The constructs related to the website and brand mediate the relationships between the convenience construct and both propensity to leave and potential to join constructs.*

P4f: *The constructs related to the website and brand mediate the relationships between the communication construct and both propensity to leave and potential to join constructs.*

### **7.5.2 Conceptual framework of the second experimental design study**

The second experimental study aimed to examine whether the effect of the admin-avatar condition (based on text or not) and its language significantly differs for the different aspects, users' attitudes and behaviours. It also sought to examine the impact of the different aspects (anthropomorphism, clarity, control and convenience) on the outcomes (e.g., word of mouth, feedback and recommendation) mediated by consequences related to the website (hedonic characteristics, recall information, ease of using the website, social presence, usefulness and attitude towards the website) and consequences related to the university (attitude towards the university). Finally, it examined whether familiarity with the admin-avatar moderates the relationships between the different aspects and the consequences related to the website, particularly hedonic characteristics, recall information, ease of using the website and social presence.

Arranging constructs in this model was also mainly in line with the reasoned action theory (Fishbein & Ajzen, 1975), which provides theoretical guidance for interpreting the relationships among cognition (represented by the admin-avatar aspects in the current research), affection (represented by the attitudinal consequences towards the website and university) and behavioural intention constructs (represented by the outcomes), as shown in Figure 7.5. Figure 7.5 presents word of mouth, recommendation and feedback as

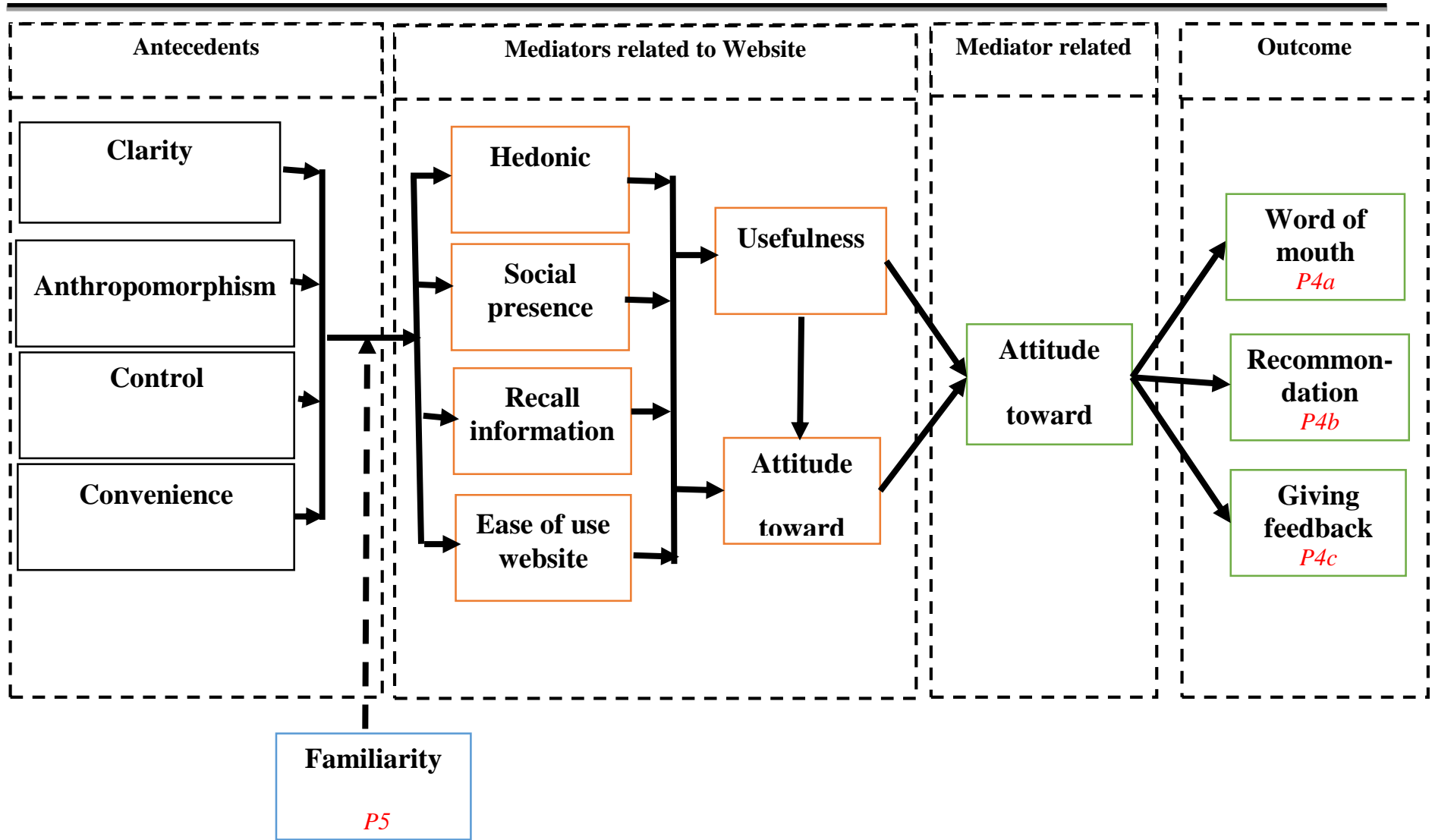


Figure 7. 6 Conceptual framework for study two

consequences of indirect relationships with the admin-avatar aspects (anthropomorphism, clarity, control and convenience), mediated by the attitudinal consequences towards the website and university. It is important to note that some direct relationships, such as the direct relationships between the admin-avatar aspect and usefulness or attitude towards the website, were not considered to simplify the conceptual framework. Therefore, the propositions of this study are:

*P1: The degree of anthropomorphism, clarity, control, familiarity and convenience is significantly affected by the condition (admin-avatar and admin-avatar based on text) and the language used (English and user's own language).*

*P2: The students' perceptions of the consequences related to the website (hedonic characteristics, usefulness, social presence, recall information, ease of using the website and attitude towards the website) are significantly affected by the admin-avatar condition and the language used (English vs. students' own language).*

*P3: The students' perceptions of the consequences related to brand (attitude towards brand, recommendation, word of mouth and feedback) is significantly affected by the admin-avatar condition and the language used (English vs. students' own language).*

*P4: The constructs related to the website (hedonic characteristics, social presence, recall information, ease of using the website, usefulness and attitude towards the website) and brand (attitudes towards brand) mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and outcomes (word of mouth, recommendation and feedback).*

Proposition 4 is divided into three sub-propositions as follows:

*P4a: The constructs related to the website and brand mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and word of mouth.*

*P4b: The constructs related to the website and brand mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and recommendation.*

*P4c: The constructs related to the website and brand mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and feedback.*

*P5: The familiarity construct moderates the relationships between antecedent constructs (anthropomorphism, clarity, control and convenience) and constructs related to the website (particularly hedonic characteristics, social presence, recall information and ease of using the website).*

**7.6 Chapter summary**

This chapter began by illustrating the main attitudinal consequences of using the admin-avatar. The section was divided into two subsections: consequences related to the website and consequences related to the university. The consequences related to the website included hedonic characteristics, helpfulness, gentleness, informativeness, information recall, usefulness, ease of using the website, attitudes towards the website and social presence. The consequences related to the university included pride, attitude towards the university, relationship quality and student orientation. The second section in this chapter addressed, in detail, the behavioural consequences of using the admin-avatar. It included propensity to leave, potential to join and voluntary behaviours. After that, the admin-avatar taxonomy was discussed. Finally, the frameworks which will be quantitatively examined were developed, showing the theories which supported them. Chapter 8 will discuss the experimental design study and quantitative data analysis and results of the first study (providing information conditions).

**Chapter Eight:**  
**Experimental design study and quantitative data analysis and results:**  
**Study one: providing information conditions**

### **8.1 Introduction**

Chapters Six and Seven analysed the qualitative data collected from the interviews. A comprehensive taxonomy resulted from these two chapters. The taxonomy was divided into three parts: antecedents (admin-avatar dimensions and conditions), consequences related to the website and consequences related to the brand. This chapter presents the design and analysis of the first experimental study, which examines part of the taxonomy resulting from the qualitative phase. The chapter aims to show (1) the experimental design for the first study and its objective and (2) the analysis of collected data and the main results. Specifically, the data analysis includes a preliminary data analysis (accuracy of the data file, missing data, testing of outliers and normality), a confirmatory factor analysis (CFA), convergent validity, reliability, discriminant validity and common method bias (CMB or CMV). In addition, the propositions were tested using two main techniques: repeated measure ANOVA and the serial multiple mediator model. Figure 8.1 shows the Chapter Eight map.

### **8.2 Experimental design**

This study aimed to compare three conditions for providing information to website visitors (e.g., students). These conditions were the information style (as a control condition or variable), admin-avatar and admin-avatar based on text (manipulated variables). It also aimed to examine the impact of different dimensions (clarity, assistance role, competence, control, convenience and communication) of each condition on consequences related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards



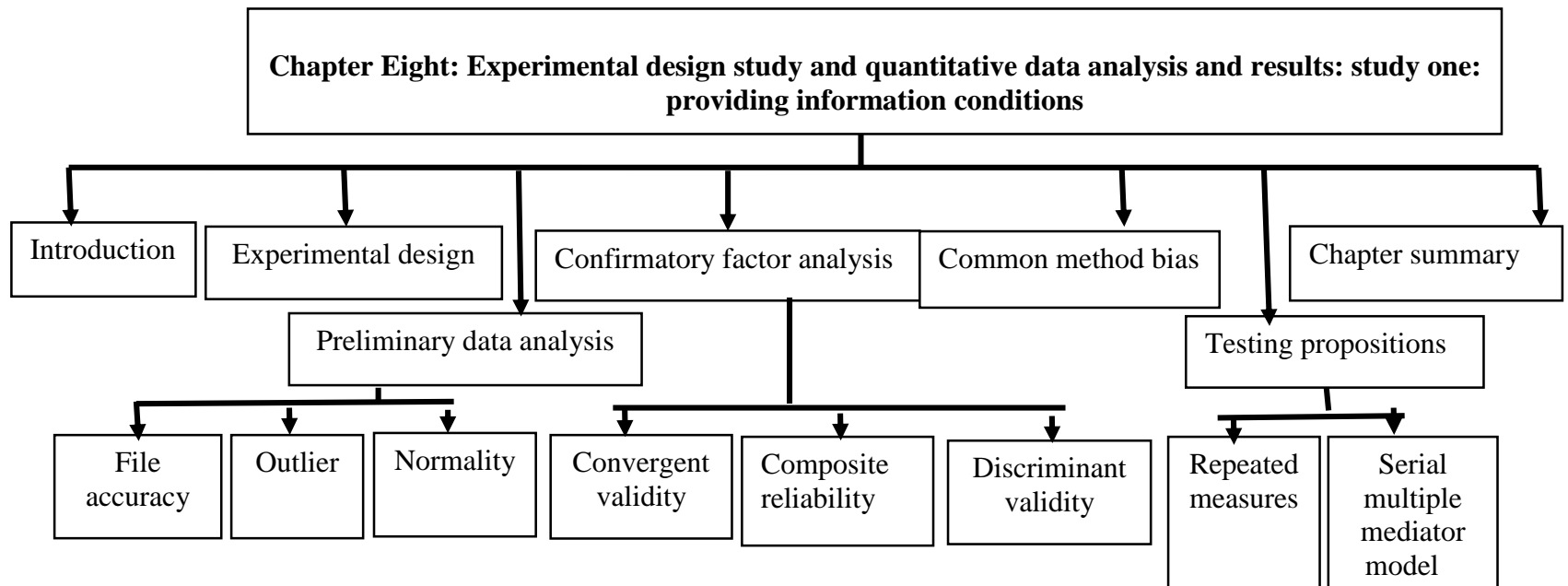


Figure 8. 1 Chapter Eight map

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the website) and consequences related to brand (pride, attitude towards the brand, propensity to leave and potential to join). Consequences related to brand (pride, attitude toward brand, propensity to leave and potential to join).

### **8.2.1 Design**

A within-subject experimental design (repeated measures) was selected to conduct this study. Each participant was exposed to the three conditions (admin-avatar, admin-avatar based on text and written information). The participants took approximately one hour to finish the three conditions (approximately 20 minutes per condition). It is important to mention that a fictitious brand was used to exclude other effects which might appear, such as brand loyalty, thereby leading to more valid results (Jin, 2009). The fictitious name used in the experiments was ‘University of Gloucester’. In the exploratory study (phase one in this thesis), a list of brand names matched to the UK cities were provided to the interviewees. All of the provided brand names were fictitious except for one which was an existing brand in order to give participants the impression that the list a combination of real and fictitious brand names (see the interview questions in Appendix E.1). The interviewees were asked to rate the brand names on the real and fictitious name scale (9-point scales), where 1 to 4 indicated different degrees of a fictitious name, 5 indicates a neutral response (i.e., the participant did not know whether the brand is real or not), and 6 to 9 indicates different degrees of a real name. The means were calculated to all names by adding all answers per name and dividing by the total of participants — namely, 31, 30 or 29 respondents (as some data were missing in some brands). The highest mean (6.48) was for the University of Gloucester.

### 8.2.2 Participants

Thirty-nine respondents drawn from the University of Hull student population participated in the experiment. Responses from two participants were dropped as their questionnaires were not valid. Approximately 57% of the participants were between 26 and 35 years old; 21 were female. Two participants were undergraduates, 33 were postgraduates and two were in a pre-session course. Table 8.1 shows participants' different backgrounds (different faculties and countries). Participants were motivated to participate as they received £7 each upon completion of the experiment.

	No.	%
<b>Total sample</b>	39	
<b>Valid</b>	37	
<b>Gender</b>		
Male	16	43.2
Female	21	56.8
<b>Age</b>		
18-25	7	18.9
26-35	21	56.8
36-45	8	21.6
46-55	1	2.7
<b>Degree</b>		
Undergraduate	2	5.4
Postgraduate	33	89.2
Other	2	5.4

**Table 8. 1 Sample characteristics**

### 8.2.3 Materials

A website for the University of Gloucester was developed. Each webpage included some information about the brand — in particular, study topics (programmes) and frequently asked questions (FAQ). Each webpage was designed and/or programmed with one specific condition of providing information (admin-avatar, admin-avatar based on text and written information) as stimuli. The avatar was rented from the Sitepal company during the experiment's preparation

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and while conducting the experiments. The information was uploaded to the admin-avatar on the developed website.

Instructions files were prepared and printed to give to participants during the experiment sessions (see Appendix F.1). In addition, two specific computer rooms, with 25 PCs per room, at the University of Hull were booked to conduct all the experiment sessions there. Each room held five rows of PCs, and each row included five PCs. Only three PCs per row were used in order to reduce the crowding and ensure participants' comfort. Thus, between every two participants was an unused PC. The headsets were brought and attached to the PCs. Furthermore, envelopes with the incentive (money) were bought. The questionnaire was transformed to the Qualtrics website as this study adopted an online questionnaire. Ethical approval and informant consent for this study was obtained from the Ethics Committee of the Hull University Business School, University of Hull.

#### **8.2.4 Procedures**

To do this experiment, the participants booked their places in advance based on an email they received with the available times from which to choose. When the participants came to the computer rooms, they signed the attendance sheet and consent form (see Appendix D.2). Each participant received a general instruction sheet and specific file which included the main instructions for the experiments. Randomisation was used to achieve the true score and reduce potential error. In other words, the score resulting from experiment consisted of a true score (the measure of the thing in which the researcher is interested) and error (the influence on the participants of all types of other extraneous factors) (Field & Hole, 2010). Randomisation was used to isolate the effects of the manipulation of the independent variables and eliminate all the systematic effects on the participants' behaviours. To apply this in the current study, six

possibilities were identified (based on the three conditions manipulated) for ordering the conditions, as shown in Table 8.2. On average, every six participants were allocated to each possibility (number of participants per possibility=  $39$  (sample size)/  $6$  (number of possibilities)=  $6.5 \approx 6$  per possibility). For example, the instructions file for possibility one was given to the first participant in the first session, the second file with possibility two was given to the second participant in the same session,,,,, until the sixth participant who was given the instructions file for possibility six. The seventh participant attended was given the instructions file for possibility one,, etc.

<b>Order of conditions</b>	<b>Possibility one</b>	<b>Possibility two</b>	<b>Possibility three</b>	<b>Possibility four</b>	<b>Possibility five</b>	<b>Possibility six</b>
<b>First</b>	Admin- avatar	Admin- avatar	Admin- avatar based on text	Admin- avatar based on text	Written information style	Written information style
<b>Second</b>	Admin- avatar based on text	Written information style	Admin- avatar	Written information style	Admin- avatar	Admin- avatar based on text
<b>Third</b>	Written information style	Admin- avatar based on text	Written information style	Admin- avatar	Admin- avatar based on text	Admin- avatar

**Table 8. 2 Six possibilities of randomisation**

After receiving the instructions file, the participants headed to the PCs to start reading and following the instructions (see Appendix F.1 for a sample instruction file). At the end of each condition, the participant used a link to a questionnaire and answered questions based on the condition s/he was exposed to. After completing the questionnaire, participants took two minutes to rest before going to the next condition. Each participant completed three questionnaires over a period of approximately 60 minutes total.

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### 8.3 Preliminary data analysis

#### 8.3.1 Accuracy of data file

Some actions were taken to safeguard the accuracy of a data file, such as proofreading the original data against the computerised data. No difference was found between the two versions. The univariate descriptive statistics — namely, IBM SPSS frequencies — were used for two main reasons. First, all the cases were categorised as one of the three conditions (i.e., admin-avatar, admin-avatar based on text or written information style), resulting in some small edits to the condition item (e.g., adding a dash between *admin* and *avatar* in some cases, changing capital letters to lowercase letters for consistency and standardisation). Three of the completed questionnaires were ultimately dropped because one of the participants wrote different words than the three options available in the condition exposed question. Second, the frequencies were been defined for two items: ‘Please select the middle answer’ and ‘If you read this item, please select Strongly Agree as a response to this question’. This was done to check whether the participant was reading the questionnaire carefully or not. As a result of inappropriate responses, two more questionnaires were dropped. Furthermore, it was recognised that some values of continuous variables (on some scales) were not within the identified range. By reviewing these scales, it was found that exporting the responses from the Qualtrics website to the SPSS file led to some changes. For example, some scales ranged between strongly disagree (1) and strongly agree (7). However, for these items, it was found agree was reflected by 9 instead of 6, strongly agree by 10 instead of 7, etc. All items and responses were carefully reviewed and changed to reflect the correct corresponding numbers. Finally, all items were revised to avoid negative statements. As no negative statements were included, there was no need to revise any item.

### 8.3.2 Missing data

In the current experiment, no data were missing because the data was collected using a web-based questionnaire where the participants were required to answer all the items on the screen before proceeding to the next page. Therefore, the analysis of missing values was ignored in this study.

### 8.3.3 Testing for outliers

As mentioned in Chapter Five, two methods were used to detect potential outliers. First, using z-scores, the findings revealed that the majority of the cases were below  $\pm 3.29$  z-scores ( $p < 0.001$ ), indicating the absence of significant outliers (Hair et al., 2010). More precisely, the findings identified seven cases (9, 13, 26, 62, 70, 71 and 103) with different negative z-scores exceeding 3.29, as shown in Table 8.3. In line with Hair et al. (2010), these outliers were noted and should remain unless demonstrable evidence indicates that they are unrepresentative of any observations in the population.

Item	Case number	Z score
{condition name} gives me the required information	26	-3.71470
	70	-3.71470
{Condition name} summarises the information.	9	-6.62433
{Condition name} is convenient for me to get the required information.	26	-3.30976
	62	-3.30976
	103	-3.30976
I can remember the-core information on the topics provided by {condition name}.	71	-3.29491
I would join the University of Gloucester as getting information through the {condition name} is easy.	13	-5.02379

**Table 8. 3 Assessment of outliers using z-scores**

Second, the further detection of outliers using boxplots led to the identification of a number of outliers, as shown in Table 8.4. Generally, outliers detected were retained as they did not appear to be unique or representative of the population. In other words, it is normal to find participants who extremely agree or disagree with these items.

Item	Case number
The {condition name} is:-Vague..... Well-defined	56, 62, 67, 82,86
The {condition name} is:-Not obvious..... Obvious	26,62,82
Adding { condition name } to the website makes it:-difficult to use:..... not difficult to use	4
Adding {condition name} to the website makes it:-requires a lot of effort to use: ..... Does not require a lot of effort to use.	4,96
{Condition name} allows me to control:-the access to required information from the entire body of information.	26,30,34 62,71
It is easy to deal with the {condition name}	34,56,62,81,84,101,103,104
The time required to receive the required information is appropriate.	71, 81,82,84, 85, 96, 101, 103,104
I am able to get to the information from {condition name} quickly.	62, 71, 81, 84, 85, 88,96, 99, 101, 104, 110.
{Condition name} answers my queries.	34,35, 62, 70, 72, 103, 107, 108
{Condition name} gives me the required information.	26, 64, 70, 71, 103, 107
{Condition name} instructs me to get the required information.	35, 63, 64, 70, 89, 107
{Condition name} summarises the information.	9, 62, 64, 70, 71, 95, 98, 107
{Condition name} is convenient for me to get the required information.	11, 26, 56, 62, 81, 103, 107
{condition name} is an effective way to provide information	56, 62, 70, 103
{Condition name} is a competent tool to provide brief information.	56,70, 93
{Condition name} is an appropriate way to provide this amount of information.	26, 56, 62, 64, 103
{Condition name} is a good communication tool for delivering brief information.	85, 99, 103, 105
{Condition name} increases my attention when browsing.	85, 86, 88, 95, 96, 103, 109
{condition name} provides relevant information.	26, 56, 70, 71, 73, 88, 101, 103
{Condition name} does a good job of presenting the information.	19, 62, 71, 73, 96, 101,103
I feel self-respected.	80
I feel self-worth.	3, 18, 43, 72, 79, 86, 88, 99
I can remember the-core information on the topics provided by {condition name}.	56, 70, 71, 80, 81, 86, 88, 101, 107
Attitude toward university ..... Very good university	43, 55, 74, 79, 86, 88, 99
Attitude toward university ..... Modern	80, 82, 85, 86, 88, 92, 95, 96, 99, 109
I would probably look for another university.	61
I would join the University of Gloucester.	3, 18, 79, 80,86, 99,102
I would join the University of Gloucester as getting information through the {condition name} is easy.	13
The chance to joining the University of Gloucester is high.	15, 18, 43,70, 98, 99, 102

**Table 8. 4 Assessment of outliers using boxplots**

#### 8.3.4 Test of normality

In line with Stevens' (1992) suggestions, the normality assumptions were initially examined through skewness and kurtosis. The results of this test showed that the positive skewness values



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ranged from .009 to 0.233 while the negative values ranged from -.056 to -1.833. Positive kurtosis values ranged from .026 to 4.579; negative kurtosis values ranged from -.010 to -1.105. As mentioned in Chapter Five, when the values of skewness and kurtosis are zero, the distribution is normal (Tabachnick & Fidell, 2013). According to Curran et al. (1996), when the ‘univariate skewness and Kurtoses score 2.0 and 7.0 respectively, it is called moderately nonnormal distribution, which arises from significant problems with at least these scores’ “suspect values” (p. 26). Therefore, having skewness and kurtosis values under 2 and 7 correspondingly shows that the data distribution is more or less normally distributed (Curran et al., 1996). In addition, the normality assumption was measured using Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) tests. The results of the both tests presented that, as shown in Appendix H.1, all the items were significant ( $p < 0.05$ ), representing a deviation from normality. Some points can be raised that might interpret the results as showing the non-normality of items using K-S and S-W tests. First, Nunnally and Bernstein (1994, p. 168) stated that ‘real test scores (for trait measures) based upon item sums are rarely normally distributed, even if the number of items is large, because items on a real test are positively correlated and not uncorrelated (independent)’. Second, Stewart (2001) stated that, because of the (small) size of the sample, the null hypothesis of normality at the K-S test in SPSS is almost always rejected (Stewart, Barnes, Cudeck, Cote, & Malthouse, 2001). Third, Cudeck (2001, p. 80) indicated that ‘variables rarely are normally distributed’, and ‘virtually no variable follows the normal distribution’ (Stewart et al., 2001). Finally, Malthouse (2001, p. 81) stated that ‘7-point scales are not normally distributed’ (Stewart et al., 2001).

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## 8.4 Confirmatory factor analysis, convergent validity, reliability and discriminant validity

The relevant constructs/factors were split into three sets of theoretically related variables: antecedents, consequences related to the admin-avatar and the website and consequences related to the brand. This is in line with, for example, Baker and Sinkula (1999), who explained the need for this approach based on two reasons: “(1) to test for construct convergence within maximally similar sets of variables and (2) to avoid violating recommended minimal sample size to parameter estimate ratios” (p. 418). Therefore, this section is divided into three main subsections, each of which shows the confirmatory factor analysis, convergent validity, reliability and discriminant validity for each set of related variables. Table 8.5 shows a summary of the three models conducted by the confirmatory factor analysis.

### 8.4.1 *The output of model one: the antecedents*

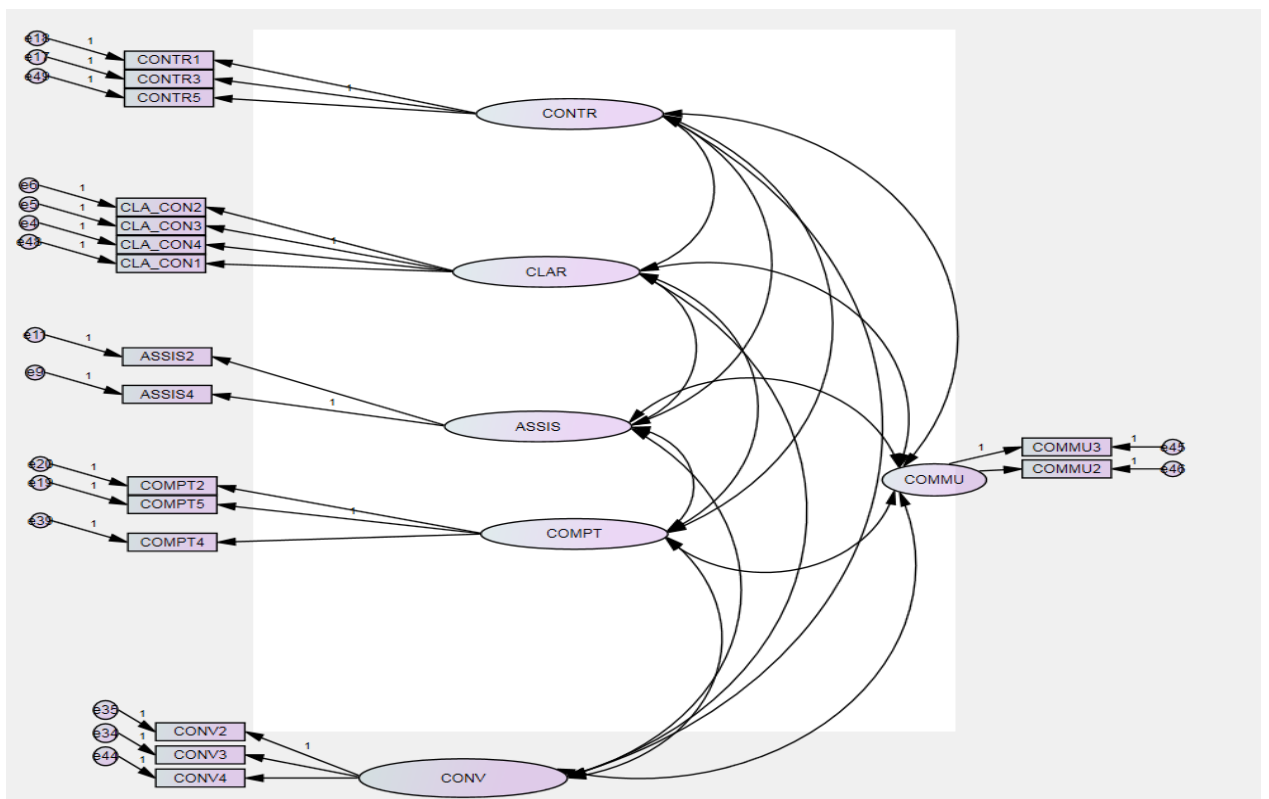
A 31-item, six-factor model was estimated using AMOS 22. The assessment of model fit revealed that  $\chi^2(449) = 1012.806$ ,  $p = .000$ , GFI = .625, CFI = .818, TLI = .799 and RMSEA = .107, indicating the model was not fit. An inspection of the modification indices (MIs) revealed that 14 items were candidates for removal. This iterative process ended with a 17-item, six-factor model. Model fit was improved as shown in Table 8.5:  $\chi^2(104) = 128.563$ ,  $p > .001$ , GFI = .885, CFI = .982, TLI = .976 and RMSEA = .046.

The number of degrees of freedom did satisfy the assumed criterion ( $1.236 < 2$ ), indicating that the quality of the model is good. The resulting measurement model is shown in Figure 8.2. The improved confirmatory factor model (17 items) included three convenience items, four clarity items, two assistance items, three competence items, three control items and two communication items. The standardised and unstandardised item-loading estimates on their hypothesised dimensions are shown in Appendix I.1. The standardised item-loading estimates

Measurement model (part of model)	CMIN /DF	CMIN	P	GFI	AGFI	CFI	TLI	RMSEA
Model one: antecedents	1.236	128.563	.052	.885	.831	.982	.976	.046
Model two consequences related to the website (attitude toward website as a second order construct)	1.248	132.250	.043	.879	.825	.985	.981	.047
Model three: consequences related to the brand (attitude toward brand as a second order construct)	1.253	137.821	.037	.876	.827	.982	.977	.048

**Table 8. 5 Summary of the three models conducted by CFA**

ranged from .659 to .944, with  $\chi^2$  values ranging from 7.399 to 19.486 ( $p < 0.000$ ), indicating highly significant item loadings (Appendix I.1).



**Figure 8. 2 Antecedents model (Confirmatory factor analysis)**

**Convergent validity and composite reliability:** Four criteria were used to evaluate the convergent validity of constructs' variables. As shown in Appendix I.1, all factor loadings' estimates were above .5. All of C.R. values  $> 1.96$  (loadings ranged from 7.399 to 19.486 ( $p < .001$ )), providing support for the constructs' convergent validity. Composite reliability (CR)

Should exceed the recommended level of .7, and average variance extracted (AVE) should be greater than the generally acceptable cut-off point of .5 (see section 5.5.2.5 in Chapter Five for more details). CR and AVE were calculated for each variable using Fornell and Larcker's (1981) and Janssens et al.'s (2008) formulas. As Table 8.6 indicates, all CRs were above the recommended level of .7, ranging between .819 and .939, confirming the convergent validity; AVE estimates ranged from .604 to .795, providing additional support of the constructs' convergent validity. Therefore, the data support the convergent validity of the antecedents' model.

	CR	AVE	CONV	CLAR	CONTR	COMPT	ASSIS	COMMU
CONV	0.873	0.701	<b>0.837</b>					
CLAR	0.939	0.795	0.647	<b>0.891</b>				
CONTR	0.857	0.667	0.713	0.517	<b>0.817</b>			
COMPT	0.819	0.604	0.743	0.674	0.764	<b>0.777</b>		
ASSIS	0.836	0.720	0.480	0.424	0.616	0.647	<b>0.848</b>	
COMMU	0.861	0.756	0.503	0.477	0.663	0.717	0.464	<b>0.870</b>

**Table 8. 6 Average variance extracted (AVE), composite reliabilities (CR), construct correlations, and square root of AVE on the diagonal (antecedent Constructs)**

**Discriminant validity:** After assessing the convergent validity and CR of the constructs, discriminant validity was assessed. Table 8.6 shows that all square root of AVE estimates on the diagonal were greater than the construct correlations with another factor, providing evidence of discriminant validity for all these constructs (Janssens et al., 2008).

#### **8.4.2 Output of model two: consequences related to the website**

The second model of the CFA was built. A 35-item, five-factor model was estimated. Assessment of the model's fit revealed that  $\chi^2 (547) = 1199.037$ ,  $p = .000$ , GFI = .620, CFI = .853, TLI = .840 and RMSEA = .104, indicating the model was not fit. An inspection of the MIs revealed that 18 items were candidates for removal. This iterative process ended with a 17-item, five-factor model. The model's fit was improved as shown in Table 8.5:  $\chi^2 (106) =$

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132.250,  $p > .001$ , GFI = .879, CFI = .985, TLI = .981 and RMSEA = .047. The number of degrees of freedom satisfied the assumed criterion ( $1.248 < 2$ ), indicating that the quality of the model is good. The improved confirmatory factor model (17 items) showed attitude towards the website as a second-order construct consisting of three first-order constructs (two attractiveness items, two likeability items, three novelty items), three recall information items, three hedonic characteristic items, two usefulness items and two ease of use items. The standardised and unstandardised item-loading estimates on their hypothesised dimensions are shown in Appendix I.2. The standardised item-loading estimates ranged from .554 to .973, with  $\chi^2$  values ranged from 6.510 to 16.756 ( $p < 0.001$ ), indicating highly significant item loadings.

**Convergent validity and composite reliability:** Again, four criteria were used in evaluating the convergent validity of constructs' variables. All factor loadings estimates, as shown in Appendix I.2, were above .5. All C.R. values  $> 1.96$  (loadings ranged from 6.510 to 16.756 ( $p < .000$ )), providing support for the constructs' convergent validity. CR and AVE were calculated for each variable. As Table 8.7 shows, all CR were above the recommended level of .7, ranging between .785 and .945, confirming the convergent validity; AVE estimates ranged from .648 to .852, exceeding the .50 cut-off, providing additional support for the constructs' convergent validity. Therefore, the data support the convergent validity of the antecedents' model.

**Discriminant validity:** Table 8.7 shows that all square root of AVE estimates on the diagonal, were greater than the one absolute value of the correlations with another factor. This provided evidence of discriminant validity for all these constructs.

	CR	AVE	HED	RECI	ATTW	USEF	EOUW
HED	0.935	0.827	<b>0.909</b>				
RECI	0.945	0.852	0.565	<b>0.923</b>			
ATTW	0.945	0.851	0.841	0.659	<b>0.923</b>		
USEF	0.785	0.648	0.448	0.677	0.673	<b>0.805</b>	
EOUW	0.918	0.849	0.470	0.657	0.528	0.550	<b>0.921</b>

**Table 8. 7 AVE, CR, construct correlations, and square root of AVE on the diagonal (consequences related to the website)**

#### **8.4.3 Output of model three: consequences related to the brand**

The third model of the CFA was built. A 27-item, four-factor model was estimated. Assessment of model fit revealed that  $\chi^2(315) = 611.853, p = .000, GFI = .710, CFI = .901, TLI = .890$  and  $RMSEA = .093$ , indicating the model was not fit. Ten items were candidates for removal. This iterative process ended with a 17-item, four-factor model. The model fit was improved as shown in Table 8.5:  $\chi^2(110) = 137.821, p > .001, GFI = .876, CFI = .982, TLI = .977$  and  $RMSEA = .048$ . The number of degrees of freedom satisfied the assumed criterion ( $1.253 < 2$ ), indicating that the quality of the model is good. The improved confirmatory factor model (17 items) showed attitude towards the brand as a second-order construct consisting of three first-order constructs (four modernity items, three image items and three recall brand items), two pride items, three propensity to leave items and two potential to join items. As shown in Appendix I.3, the standardised item-loading estimates ranged from .406 to .966, with  $\chi^2$  values ranging from 3.852 to 21.479 ( $p < 0.000$ ), indicating high significance on the majority of item loadings.

**Convergent validity and composite reliability:** Based on the four criteria used in evaluating the convergent validity of constructs' variables, the factor loadings estimates, as shown in Appendix I.3, were above .5 (except RECU3 and TEND2). All C.R. values were  $> 1.96$  (loadings ranged from 3.852 to 21.479 ( $p < .000$ )), providing support for the constructs' convergent validity. In addition, Table 8.8 shows that all CR were above the recommended level of .7, ranging between .758 and .946, confirming the convergent validity; the AVE

estimates ranged from .562 to .854, exceeding the .50 cut-off and providing additional support for the constructs' convergent validity. Therefore, the data support the convergent validity of the antecedents' model.

**Discriminant validity:** Table 8.8 shows that all square root of AVE estimates on the diagonal were greater than the one absolute value of the correlations with another factor. This provided evidence of discriminant validity for all these constructs.

	CR	AVE	PTJ	PRI	TEND	ATT_U
PTJ	0.758	0.616	<b>0.785</b>			
PRI	0.912	0.839	0.582	<b>0.916</b>		
TEND	0.768	0.562	-0.501	-0.214	<b>0.749</b>	
ATT_U	0.946	0.854	0.689	0.818	-0.304	<b>0.924</b>

**Table 8. 8 AVE, CR, construct correlations, and square root of AVE on the diagonal of the consequences related to the brand**

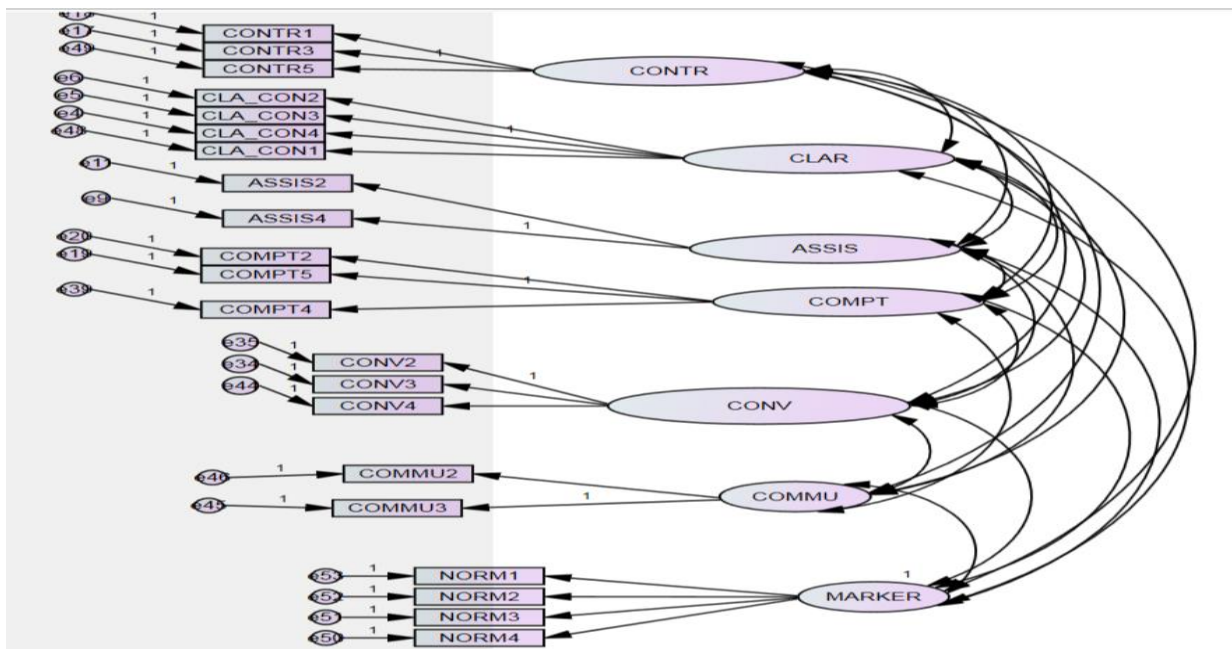
## 8.5 Common method bias

As mentioned in Chapter Five, two main types of remedies, procedural remedies and statistical remedies, should be taken to minimise the method variance. This section deals with the statistical remedies to assess the severity of common method bias. A comprehensive CFA marker technique by Williams et al. (2010) was adopted in this study. This technique was conducted on the three models: antecedents, consequences related to the website and consequences related to the brand.

### 8.5.1 Common method bias: the antecedents

In line with Williams et al.'s (2010) suggestions, a four-item perfectionism construct was selected as the marker variable as no theoretical linkages between this marker variable and the six antecedents' constructs have been reported in the literature. After selecting the marker variable, four nested CFA models were assessed to test for the presence and equality of method variance associated with the marker variable: the CFA model, the baseline model, method C

model and method R model. In the CFA model, all variables (including the marker variable) were allowed to correlate, as shown in Figure 8.3.



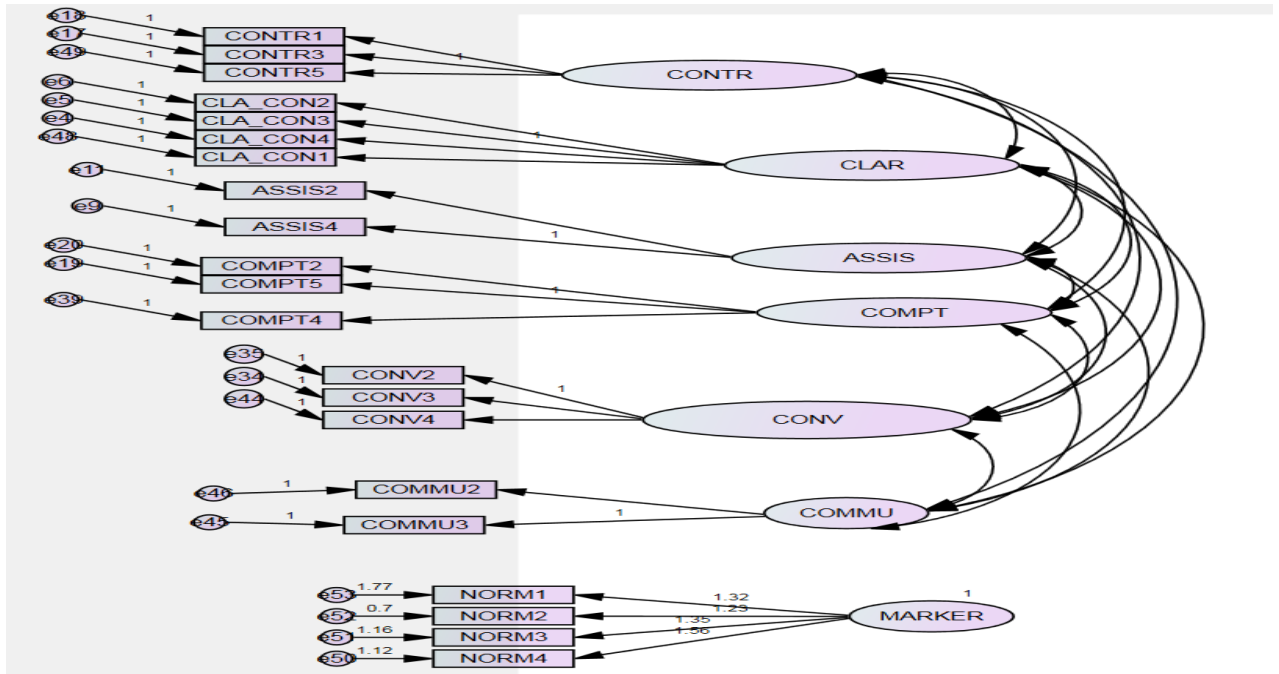
**Figure 8. 3 Common method bias- CFA model (antecedents)**

The CFA model allows for a complete set of correlations among the six substantive latent variables (control, clarity, assistance, competence, convenience and communication) and the marker latent variables (perfectionism). The main objective in assessing this model was to obtain the factor loading and measurement error variance estimates for the four marker variable indicators for use in following models.

The baseline model was the second model evaluated, as shown in Figure 8.4, which allows the six substantive factors to be correlated with each other. However, there was an orthogonal marker latent variable with the substantive factor indicators having fixed factor loadings and fixed error variances. The unstandardised factor loadings from the CFA model were used as fixed values for the four indicators: 1.32, 1.23, 1.35 and 1.56, respectively. The unstandardised error variances were 1.77, .70, 1.16 and 1.12. The use of these fixed values was necessary to



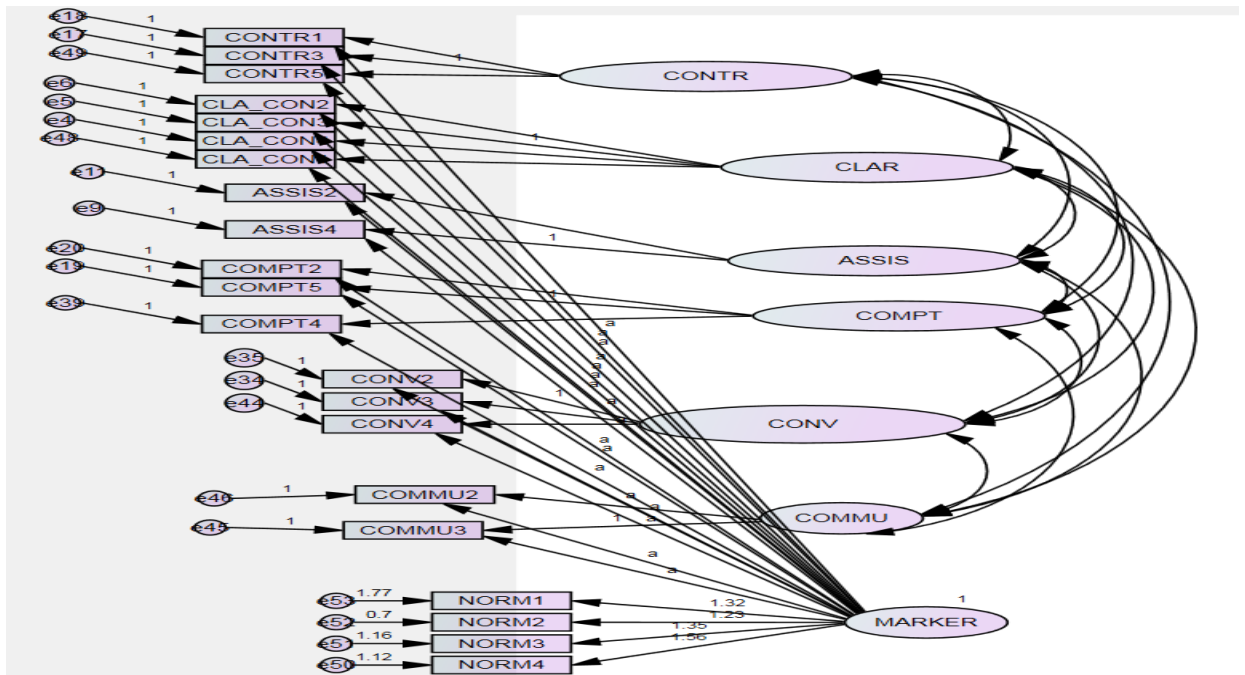
establish the meaning of the marker latent variable because, in all following models, the marker latent variable was linked to the substantive indicators through secondary factor loadings (Williams et al., 2010). The assumption of the marker latent variable to be orthogonal with the baseline model was to have it specified so that all subsequent model comparisons would focus only on method variance factor loadings (Williams et al., 2010).



**Figure 8. 4 Common method bias: the baseline model (antecedents)**

The method C model was assessed as shown in Figure 8. 5. This model is similar to the baseline model in two ways: the method marker variable was assumed to be the orthogonality of the method marker variable and the fixed values of the measurement parameters associated with its indicators. However, the main difference in the method C model was the added factor loadings from the method marker variable latent to each of the 17 indicators in the model. Each of the marker method factor loadings related to the substantive items was forced to be of equal value to others to reflect the assumption of the common variance method model of equal method effects. The comparison of the method C model with the baseline model provides a test of the

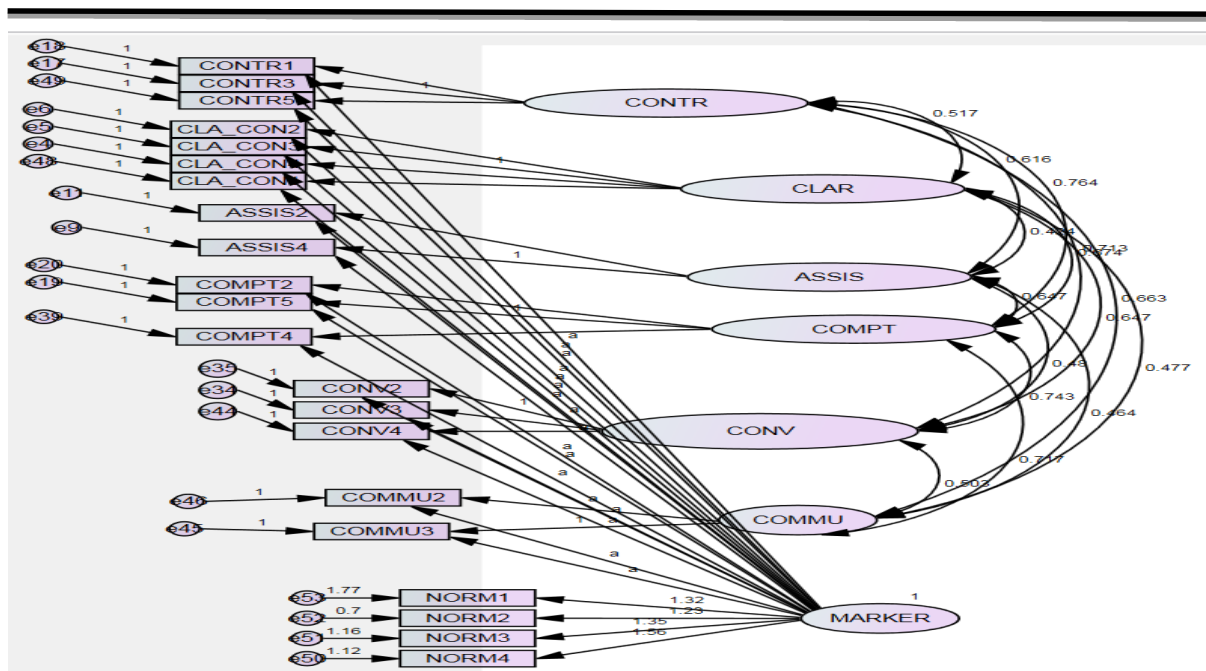
presence of equal method variance effects associated with the marker variable (Williams et al., 2010).



**Figure 8. 5 Common method bias: method-C model (antecedents)**

Finally, in the method R model (Figure 8.6), the obtained factor correlations for control, clarity, assistance, competence, convenience and communication from the baseline model were used as fixed values. A comparison of the method C to the method R model offered the statistical test of the biasing effects of the marker variable on substantive relationships.

The model fit results of the analyses for each model are shown in Table 8.9, which includes the chi-square, degrees of freedom, CFI values and chi-square comparison tests. Based on the results, the baseline model demonstrated fit:  $CFI = .955$  and  $X^2 = 250.357$ , with 178 degrees of freedom.



**Figure 8. 6 Common method bias: method-R model (antecedents)**

The baseline model and method C model were compared to test the null hypothesis that the method factor loadings associated with the marker variable were not related to each of the 17 substantive indicators. The comparison of the two models did not provide support that method variance is present because there was no a significant difference between the models. Specifically, as shown in Table 8.9, the comparison revealed a chi-square difference of 1.625 with one degree of freedom, which does not exceed the 0.05 chi-square critical value for one degree of freedom of 3.84. Therefore, the factor loadings were not significantly biased by common method variance.

Model	X <sup>2</sup>	df	p	CFI
CFA	244.786	168	.000	.952
Baseline	250.357	178	.000	.955
C	248.732	177	.000	.955
R	248.772	192	.004	.964
Δ Models	Δ X <sup>2</sup>	Δ df	P	
Baseline vs. Method-C	1.625	1	0.202	
Method-C vs. Method- R	.040	15	1.0	

**Table 8. 9 Common method bias: goodness of fit values and model comparison tests (antecedents)**

The second comparison, here, was between method C and method R models to further examine whether the correlation parameter estimates were significantly biased by marker variable method effects or not. The chi-square difference test resulted in no significant difference between both models (see Table 8.9), indicating that there was no significant bias demonstrated in the correlation estimates by the marker variable. This means that there was no significant difference between the baseline model factor correlations and method C model factor correlations, as shown in Table 8.10.

			Estimate	
			Baseline	Method C
Clarity	<-->	Control	.517	.510
Control	<-->	Competence	.764	.758
Control	<-->	Convenience	.713	.706
Assistance	<-->	Control	.616	.609
Clarity	<-->	Assistance	.424	.418
Clarity	<-->	Competence	.674	.669
Clarity	<-->	Convenience	.647	.639
Assistance	<-->	Competence	.647	.640
Assistance	<-->	Convenience	.480	.468
Competence	<-->	Convenience	.743	.735
Control	<-->	Communication	.663	.651
Clarity	<-->	Communication	.477	.468
Assistance	<-->	Communication	.464	.452
Competence	<-->	Communication	.717	.707
Convenience	<-->	Communication	.503	.492

**Table 8. 10 Common method bias: baseline model and method-C model factor correlations (antecedents)**

### 8.5.2 Common method bias: consequences related to the website

Similar to the antecedent constructs, the four nested CFA models were assessed to test for the presence and equality of method variance associated with the marker variable. In the CFA model, all variables (including the marker variable) were allowed to correlate. The CFA model allowed for a complete set of correlations among the five substantive latent variables (recall information, hedonic, usefulness, attitude towards website and ease of using the website) and the marker latent variable (perfectionism).

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The baseline model was the second model evaluated, which allowed the five substantive factors to be correlated with each other. However, there was an orthogonal marker latent variable with the substantive factors indicators having fixed factor loadings and fixed error variances. The unstandardised factor loadings from the CFA model were used as fixed values for the four indicators: 1.35, 1.25, 1.32 and 1.53, respectively. The unstandardised error variances were 1.68, .64, 1.22 and 1.21. In addition, the method C model was assessed. This model is similar to the baseline model, as previously mentioned, but the main difference in the method C model was the added factor loadings from the method marker variable latent to each of the 17 indicators in the model. Each of the marker method factor loadings related to the substantive items was forced to be equal in value to the others to reflect the assumption of the common variance method model of equal method effects. Finally, in the method R model, the obtained factor correlations for recall information, hedonic characteristics, usefulness, attitude towards website and ease of using the website from the baseline model were used as fixed values in the method C model.

The model fit results of the analyses for each model are shown in Table 8.11, which includes the chi-square, degrees of freedom, CFI values and chi-square comparison tests. Based on the results, the baseline model showed fit:  $CFI = .984$  and  $X^2 = 210.580$ , with 180 degrees of freedom. The baseline model and method C model were compared to test the null hypothesis that the method factor loadings associated with the marker variable were not related to each of the 17 substantive indicators. The comparison of the two models did not provide support that method variance is present as there was no a significant difference between both models. Specifically, as shown in Table 8.11, the comparison revealed a chi-square difference of 0.656 with one degree of freedom, which does not exceed the 0.05 chi-square critical value for one degree of freedom of 3.84. Therefore, it indicated that the factor loadings were not significantly biased by common method variance.

Model	X <sup>2</sup>	df	p	CFI
CFA	206.501	171	.033	.982
Baseline	210.580	180	.059	.984
C	209.924	179	.057	.984
R	209.957	189	.141	.989
Δ Models	Δ X <sup>2</sup>	Δ df	P	
Baseline vs. Method-C	0.656	1	0.418	
Method-C vs. Method- R	0.033	10	1.00	

**Table 8. 11 Common method bias: goodness of fit values and model comparison tests (consequences related to the website)**

The second comparison was between the method C and method R models to further examine whether the correlation parameter estimates were significantly biased by marker variable method effects or not. The chi-square difference test resulted in no significant difference between the models (see Table 8.11), indicating that there was no significant bias in the correlation estimates by marker variable. This means that there is was no significant difference between the baseline model factor correlations and method C model factor correlations, as shown in Table 8.12.

			Estimate	
			Baseline	Method-C
Recall information	<-->	Hedonic	.565	.561
Recall information	<-->	Usefulness	.677	.672
Recall information	<-->	Attitude toward website	.659	.647
Recall information	<-->	Ease of use website	.657	.653
Hedonic	<-->	Attitude toward website	.841	.840
Attitude toward website	<-->	Usefulness	.673	.669
Hedonic	<-->	Ease of use website	.470	.467
Usefulness	<-->	Ease of use website	.550	.548
Hedonic	<-->	Usefulness	.448	.444
Attitude toward website	<-->	Ease of use website	.528	.523

**Table 8. 12 Common method bias: baseline model and method-C model factor correlations (consequences related to the website)**

### 8.5.3 Common method bias: consequences related to the brand

Again, the four nested CFA models were assessed to test for the presence and equality of method variance associated with the marker variable. In the CFA model, all variables (including the marker variable) were allowed to correlate. The CFA model permits for a complete set of

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correlations among the four substantive latent variables (pride, propensity to leave, attitude towards website and potential to join) and the marker latent variable (perfectionism).

The baseline model was the second model evaluated, which allows the four substantive factors to be correlated with each other. However, there was an orthogonal marker latent variable with the substantive factors' indicators having fixed factor loadings and fixed error variances. The unstandardised factor loadings from the CFA model were used as fixed values for the four indicators: 1.35, 1.24, 1.32 and 1.54, respectively. The unstandardised error variances were 1.69, .65, 1.22 and 1.19. In addition, the method C model was assessed. This model is similar to the baseline model, as mentioned before, but the main difference in the method C model was the added factor loadings from the method marker variable latent to each of the 17 indicators in the model. The obtained factor correlations for pride, propensity to leave, attitude towards website and potential to join from the baseline model were used as fixed values in the method C model.

The model fit results of the analyses for each model are shown in Table 8.13, including the chi-square, degrees of freedom, CFI values and chi-square comparison tests. Based on the results, the baseline model demonstrated fit: CFI = .966 and  $X^2 = 243.258$ , with 183 degrees of freedom. The comparison between the baseline and method C models did not provide support that method variance was present as there was no significant difference between the models. Specifically, as shown in Table 8.13, the comparison revealed a chi-square difference of 0.002, with one degree of freedom, which does not exceed the 0.05 chi-square critical value for one degree of freedom of 3.84. Therefore, the factor loadings were not significantly biased by common method variance.

Model	X <sup>2</sup>	df	p	CFI
CFA	237.608	176	.001	.965
Baseline	243.258	183	.002	.966
C	243.256	182	.002	.965
R	243.284	188	.004	.968
Δ Models	Δ X <sup>2</sup>	Δ df	P	
Baseline vs. Method-C	0.002	1	0.964	
Method-C vs. Method- R	.028	6	1.0	

**Table 8. 13 Common method bias: goodness of fit values and model comparison tests (consequences related to the brand)**

The second comparison was between method C and method R models to further examine whether the correlation parameter estimates were significantly biased by marker variable method effects or not. The chi-square difference test resulted in no significant difference between the models (see Table 8.13), indicating that there was no significant bias in the correlation estimates by the marker variable. Thus, no significant difference occurred between the baseline model factor correlations and method C model factor correlations, as shown in Table 8.14.

			Estimate	
			Baseline	Method-C
Pride	<-->	Attitude toward brand	.818	.818
Propensity to leave	<-->	Attitude toward brand	-.304	-.304
Potential to join	<-->	Attitude toward brand	.689	.689
Propensity to leave	<-->	Potential to join	-.501	-.501
Pride	<-->	Potential to join	.582	.582
Pride	<-->	Propensity to leave	-.214	-.214

**Table 8. 14 Common method bias: baseline model and method-C model factor correlations (consequences related to the brand)**



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## 8.6 Test of propositions

### 8.6.1 Repeated measures ANOVA

*P1: The degree of clarity, control, competence, assistance, communication and convenience is more significantly affected by the admin-avatar based on text than on admin-avatar and written information conditions.*

The first proposition stated that the degree of clarity, control, competence, assistance, communication and convenience differs in the admin-avatar based on the text condition compared to the only admin-avatar condition and written information condition. Table 8.15 shows a summary of important repeated measure outputs. The results show that the degree of clarity, control, competence, assistance and convenience was not significantly affected by the conditions of providing information. Specifically, their  $F$ - ratios were  $F(2, 72) = .800$ ,  $F(2, 72) = 2.346$ ,  $F(2, 72) = .972$ ,  $F(2, 72) = .373$  and  $F(1.85, 66.59) = 1.549$ ,  $p > .05$ , respectively. However, the communication construct was significantly affected by the conditions of providing information,  $F(2, 72) = 11.044$ ,  $p < .05$ . Mauchly's test indicated that the assumption of sphericity was not violated for all constructs,  $p > .05$ , and the degrees of freedom were corrected using Huynh-Feldt estimates of sphericity (as both Greenhouse-Geisser and Huynh-Feldt estimates were above .75). Table 8.15 also shows that the contrasts among the three conditions were not significant for all constructs ( $p > .05$ ), except the contrasts between admin-avatar and admin-avatar based on text in both the control ( $p < .1$ ) and communication ( $p < .05$ ) constructs. The significance values of the post-hoc test (in Table 8.15) indicate that constructs such as clarity, convenience, assistance, competence and control did not significantly differ among the three conditions ( $p > .05$ ). This means that the scores of the five constructs, after adding admin-avatar, were not significantly different from those of admin-avatar based on text or written information (both  $ps > .05$ ).

	Mean			Sphericity	Effects		Contrasts Test		Post hoc tests		
	AA*	ABT**	WI***		F	Sig	Contrasts	Sig			Sig
<b>Clarity</b>	5.5926	5.8907	5.6654	.596	.800	.453	AA vs. ABT	.209	AA	ATB	.627
									WI	1.000	
							ABT vs. WI	.348	ATB	AA	.627
								WI	AA	1.000	
									ATB	1.000	
<b>Convenience</b>	5.3947	5.3655	4.9835	.064	1.549	.221	AA vs. ABT	.893	AA	ATB	1.00
									WI	.362	
							ABT vs. WI	.213	ATB	AA	1.000
								WI	AA	.640	
									ATB	.640	
<b>Competence</b>	5.2904	5.6235	5.4826	.520	.972	.383	AA vs. ABT	.159	AA	ATB	.476
									WI	1.000	
							ABT vs. WI	.593	ATB	AA	.476
								WI	AA	1.000	
									ATB	1.000	
<b>Assistance</b>	4.2120	4.3618	4.3719	.439	.373	.690	AA vs. ABT	.437	AA	ATB	1.000
									WI	1.000	
							ABT vs. WI	.960	ATB	AA	1.000
								WI	AA	1.000	
									ATB	1.000	
<b>Control</b>	4.3726	4.8030	4.7879	.915	2.346	.103	AA vs. ABT	.056	AA	ATB	.167
									WI	.227	
							ABT vs. WI	.948	ATB	AA	.167
								WI	AA	.227	
									ATB	1.000	
<b>Communication</b>	4.2793	5.1909	5.6651	.646	11.044	.000	AA vs. ABT	.002	AA	ATB	.007
									WI	.000	
							ABT vs. WI	.147	ATB	AA	.007
								WI	AA	.442	
									ATB	.442	

Table 8. 15 Summary of repeated measures output (antecedents)

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In contrast, the conditions significantly differed regarding communication, particularly the admin-avatar condition with the other conditions. As shown in Table 8.15, admin-avatar is considered the least communicative tool ( $M = 4.28$ ) compared with admin-avatar based on text ( $M = 5.19$ ) and written information ( $M = 5.67$ , most communicative tool).

*P2: The students' perception of the consequences related to the website (hedonic characteristics, usefulness, recall information, ease of using the website and attitude towards website) is more significantly affected by the admin-avatar based on text than the admin-avatar and written information conditions.*

The second proposition stated that students would have different perceptions regarding the consequences related to the website in the admin-avatar based on text conditions than only the admin-avatar condition and written information condition. Table 8.16 shows a summary of important repeated measure outputs. The results show that the students' perceptions of hedonic characteristics, recall information, usefulness and attitude towards the website were significantly affected by the conditions of providing information. Specifically, their  $F$ -ratios were  $F(2, 72) = 14.56$ ,  $F(1.8, 64.69) = 3.61$ ,  $F(1.94, 69.86) = 3.48$ , and  $F(2, 72) = 20.78$ ,  $p < .05$ , respectively. In addition, the three first constructs of the attitude towards website were also significantly affected by the provided information condition/type. However, the students' perception of the ease of use construct was not significantly affected by the conditions of providing information,  $F(2, 72) = 1.65$ ,  $p > .05$ .

Mauchly's test indicated that the assumption of sphericity was not violated for all constructs except recall information,  $X^2(2) 6.94$  and  $6.19$ , respectively,  $p < .05$ ; therefore, the degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ( $\epsilon = .9$ ). The results show that students' perceptions of recall information were significantly affected by the conditions of providing information,  $F(1.8, 64.69) = 3.61$ ,  $p < .05$ .

	Mean			Sphericity	Effects		Contrasts Test		Post hoc tests		
	AA*	ABT**	WI***		F	Sig	Contrasts	Sig			Sig
Hedonic	4.8344	4.9583	3.4457	.851	14.56	.000	AA vs. ABT	.702	AA	ATB	1.000
									WI	.000	
							ABT vs. WI	.000	ATB	AA	1.000
								WI	AA	.000	
									ATB	.000	
Recall information	4.6181	4.9248	4.1631	.044	3.614	.037	AA vs. ABT	.178	AA	ATB	.534
									WI	.406	
							ABT vs. WI	.025	ATB	AA	.534
								WI	AA	.406	
									ATB	.074	
Usefulness	3.9497	4.0794	3.6330	.216	3.476	.038	AA vs. ABT	.387	AA	ATB	1.000
									WI	.322	
							ABT vs. WI	.018	ATB	AA	1.000
								WI	AA	.322	
									ATB	.053	
Ease of use website	4.9556	5.3401	4.9522	.716	1.647	.200	AA vs. ABT	.130	AA	ATB	.390
									WI	1.000	
							ABT vs. WI	.142	ATB	AA	.390
								WI	AA	.427	
									ATB	.427	
Attitude toward website	5.3983	5.5773	3.9239	.560	20.775	.000	AA vs. ABT	.489	AA	ATB	1.000
									WI	.000	
							ABT vs. WI	.000	ATB	AA	1.000
								WI	AA	.000	
									ATB	.000	
							AA vs. ABT	.539	AA	ATB	1.000
									WI	.000	

Attractiveness	5.3809	5.5343	3.7907	.322	22.877	.000	ABT vs. WI	.000	ATB	AA	1.000
									WI	AA	.000
									ATB	ATB	.000
Novelty of web	5.3551	5.5186	3.2217	.122	34.484	.000	AA vs. ABT	.561	AA	ATB	1.000
									WI	WI	.000
									ATB	AA	.000
Likeability	5.2115	5.4782	4.1178	.911	10.778	.000	AA vs. ABT	.378	AA	ATB	1.000
									WI	WI	.004
									ATB	AA	.000
								WI	AA	.004	
									ATB	.000	

AA\* Admin-avatar ABT\*\* Admin-avatar based on text WI\*\*\* Written style P <.05 level

**Table 8. 16 Summary of repeated measures output (consequences related to the website)**

Table 8.16 shows that the contrasts among the conditions were not significant for the ease of using the website construct. However, the contrasts for the remaining constructs showed significant comparisons between the admin-avatar based on text and written information only ( $p = .000$  for remaining constructs except recall information and usefulness,  $p < .05$ ). By looking at the significance values of the post-hoc test (in Table 8.16), the hedonic characteristics and attitude towards the website constructs (including its first-order constructs) were significantly different for both the admin-avatar and admin-avatar based on text conditions compared to written information ( $p < .05$ ). However, these constructs were not significantly different in the admin-avatar condition compared to the admin-avatar based on text condition ( $p > .05$ ). Perceived usefulness and recall information differed significantly by admin-avatar based on text compared to the written information (both  $ps < .1$ ). Finally, the perception of the ease of using the website did not differ among the three conditions.

*P3: The students' perception of the consequences related to brand (pride, attitude towards brand, potential to join and propensity to leave) is more significantly affected by the admin-avatar based on text than admin-avatar and written information conditions.*

The third proposition stated that students would have different perceptions regarding the consequences related to the brand in the admin-avatar based on text condition than the admin-avatar condition and written information conditions. Table 8.17 shows a summary of important repeated measure outputs. The results show that only students' perceptions of attitude towards brand was significantly affected by the conditions of providing information,  $F(1.95, 70) = 24.9$ ,  $p < .05$ . In addition, the first three constructs of attitude towards brand were also significantly affected by the provided information conditions. However, students' pride, potential to join and propensity to leave constructs were not significantly affected by the conditions of providing information,  $F(1.86, 67.05) = 2.37$ ,  $F(1.94, 69.93) = 1.83$ , and  $F(1.93, 69.61) = 1.86$ ,  $p > .05$ .

	Mean			Sphericity	Effects		Contrasts Test		Post hoc tests		
	AA*	ABT**	WI***		F	Sig	Contrasts	Sig			Sig
Potential to join	4.1081	4.3784	3.9459	.591	1.380	.258	AA vs. ABT	.313	AA	ATB	.938
									WI		1.000
							ABT vs. WI	.083	ATB	AA	.938
								WI	AA	1.000	
									ATB	.248	
Pride	4.6622	4.7432	4.1757	.261	2.371	.101	AA vs. ABT	.741	AA	ATB	1.000
									WI		.375
							ABT vs. WI	.057	ATB	AA	1.000
								WI	AA	.171	
									ATB	.375	
Propensity to leave	3.6847	3.3423	3.7117	.542	1.856	.164	AA vs. ABT	.085	AA	ATB	.254
									WI		1.000
							ABT vs. WI	.104	ATB	AA	.254
								WI	AA	.312	
									ATB	.312	
Attitude toward brand	5.2081	5.3892	3.9649	.603	24.895	.000	AA vs. ABT	.375	AA	ATB	1.000
									WI		.000
							ABT vs. WI	.000	ATB	AA	1.000
								WI	AA	.000	
									ATB	.000	
Attitude toward brand (modernity)	5.7027	5.8243	3.9865	.008	35.714	.000	AA vs. ABT	.510	AA	ATB	1.000
									WI		.000
							ABT vs. WI	.000	ATB	AA	1.000
								WI	AA	.000	
									ATB	.000	
Attitude toward brand (Image)	5.0360	5.1532	4.2162	.682	9.686	.000	AA vs. ABT	.595	AA	ATB	1.000
									WI		.006
							ABT vs. WI	.000	ATB	AA	1.000
								WI	AA	.001	
									ATB	.001	
Recall the brand	4.7207	5.0450	3.6847	.858	13.084	.000	AA vs. ABT	.261	AA	ATB	.783
									WI		.003
							ABT vs. WI	.000	ATB	AA	.783
								WI	AA	.000	
									ATB	.003	

AA\* Admin-avator ABT\*\* Admin-avator based on text WI\*\*\* Written style P <.05 level

Table 8. 17 Summary of repeated measures output (consequences related to the brand)

Mauchly's test indicated that the assumption of sphericity was not violated for all constructs except attitude towards brand (modernity),  $X^2(2) 9.77, p < .05$ ; therefore, degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ( $\epsilon = .83$ ). The results show that the students' perceptions of recall information and novelty of website were significantly affected by the conditions of providing information,  $F(1.67, 60.19) = 35.71, p < .05$ . Table 8.17 further shows that the contrasts between conditions were not significant for pride, potential to join or propensity to leave constructs. However, the contrasts for the attitude towards brand (and its first-order constructs, such as recall brand) showed significant comparisons only between the admin-avatar based on text and written information style ( $p = .000$ ). By looking at the significance values of the post-hoc test (in Table 8.17), only attitude towards brand (including its first-order constructs) constructs were significantly different in both admin-avatar and admin-avatar based on text conditions compared to written information ( $p = .000$ ). However, these constructs were not significantly different in the admin-avatar condition compared to the admin-avatar based on text condition ( $p > .05$ ). In addition, the pride, potential to join and propensity to leave constructs after adding the admin-avatar were not significantly different from the admin-avatar based on text or written information conditions (both  $ps > .05$ ).

### **8.6.2 Serial multiple mediator model**

*P4: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the constructs of clarity, control, competence, assistance, communication and convenience and both propensity to leave and potential to join constructs.*



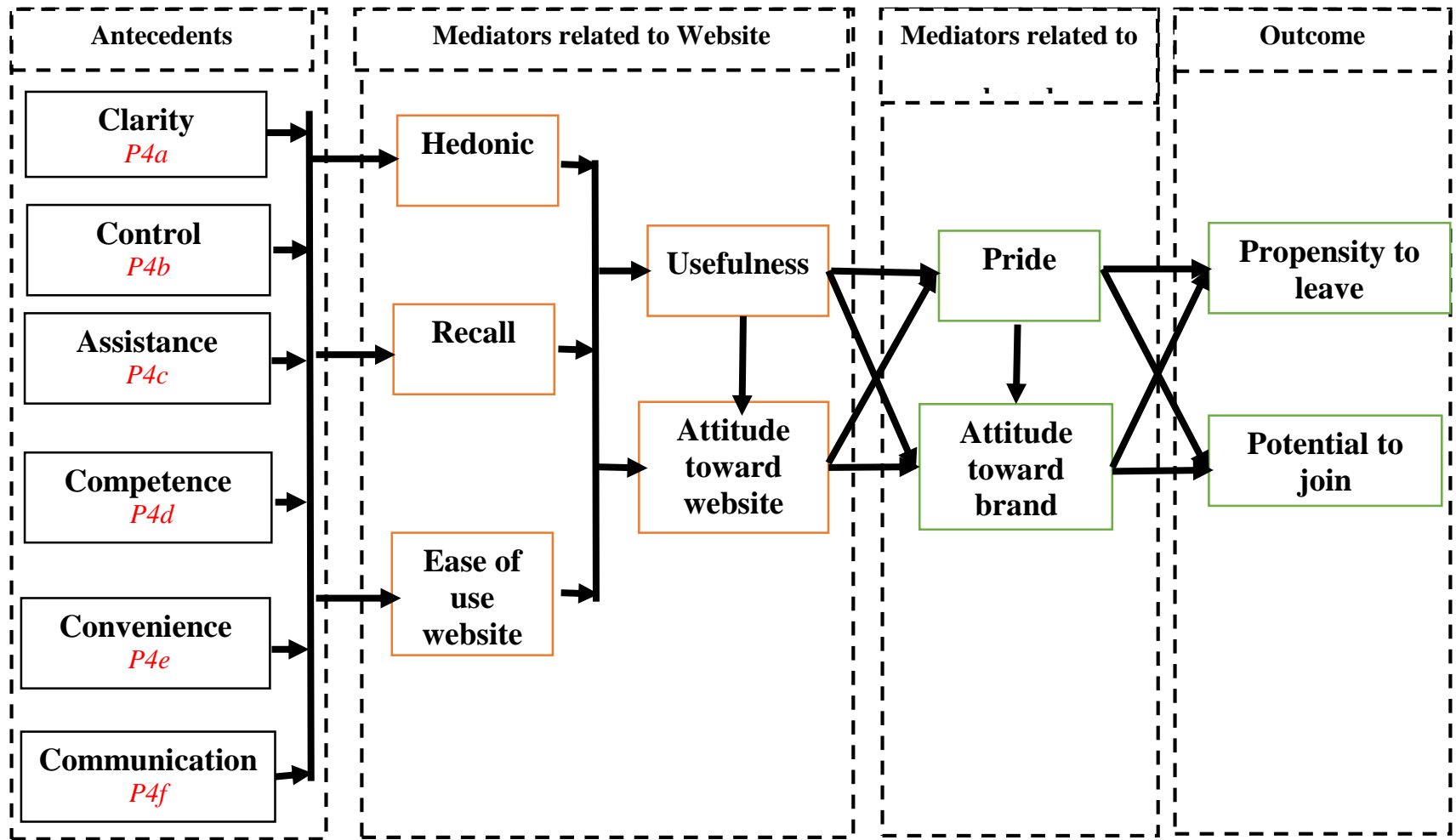


Figure 8. 7 Proposed model in experimental study one

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
Clarity .55*	Hedonic .67*	Attit-W .99*	Attit-U .56 (.0018)	-----	Potential to join	.2036	.0909	.4053
Clarity .55*	Hedonic .17 (.0003)	Usefulness .66*	Attit-W .99*	Attit-U .56 (.0018)	Potential to join	.0334	.0104	.0910

Clarity .55*	Hedonic .67*	Attit-W .63 (.0005)	Pride .26 (.0305)	-----	Potential to join	.0593	.0073	.1875
Clarity .55*	Hedonic .17 (.0003)	Usefulness .66*	Attit-W .63 (.0005)	Pride .26 (.0305)	Potential to join	.0097	.0009	.0359
Clarity .55*	Hedonic .17 (.0003)	Usefulness .22 (.0446)	Attit-U .42 (.0058)		Potential to join	.0084	.0005	
Clarity .55*	Hedonic .17 (.0003)	Usefulness .53 (.0002)	Pride .39*	Attit-U .42 (.0058)	Potential to join	.0080	.0020	.0282
Clarity .55*	Hedonic .78*	Attit-W .68*	Attit-U .46 (.0130)		Potential to join	.1328	.0505	.2911
Clarity .55*	Hedonic .78*	Attit-W .71*	Pride .23 (.0003)	Attit-U .46 (.0130)	Potential to join	.0319	.0082	.0822
Clarity .73*	Recall I .34 (.0009)	Attit-W .72*	Attit-U .55 (.0018)		Potential to join	.0974	.0389	.2335
Clarity .73*	Recall I .35*	Usefulness .79*	Attit-W .72*	Attit-U .55 (.0018)	Potential to join	.0794	.0311	.1793
Clarity .73*	Recall I .34 (.0009)	Attit-W .42*	Pride .26 (.0329)		Potential to join	.0266	.0036	.1024
Clarity .73*	Recall I .35*	Usefulness .79*	Attit-W .42*	Pride .26 (.0329)	Potential to join	.0217	.0023	.0721
Clarity .73*	Recall I .35*	Usefulness .40(.0184)	Pride .50*	Attit-U .40 (.0027)	Potential to join	.0204	.0039	.0558
Clarity .73*	Recall I .61*	Attit-W .58*	Attit-U .46 (.0122)		Potential to join	.1193	.0560	.2323
Clarity .73*	Recall I .61*	Attit-W .43*	Pride .24 (.0002)	Attit-U .46 (.0122)	Potential to join	.0214	.0083	.0540
Clarity .77*	EOUW.25 (.0386)	Attit-W .76*	Attit-U .55 (.0015)		Potential to join	.0821	.0183	.2169
Clarity .77*	EOUW .19 (.0165)	Usefulness 1.046*	Attit-W .76*	Attit-U .55 (.0015)	Potential to join	.0659	.0223	.1671
Clarity .77*	EOUW .25 (.0386)	Attit-W .49*	Pride .26 (.0269)		Potential to join	.0253	.0032	.0941
Clarity .77*	EOUW .19 (.0165)	Usefulness 1.046*	Attit-W .49*	Pride .26 (.0269)	Potential to join	.0203	.0022	.0717
Clarity .77*	EOUW.19 (.0165)	Usefulness .30 (.0185)	Attit-U .40 (.0028)		Potential to join	.0178	.0023	.0565
Clarity .77*	EOUW.19 (.0165)	Usefulness .72*	Pride .55*	Attit-U.40 (.0028)	Potential to join	.0234	.0079	.0648
Clarity .77*	EOUW.46 (.0020)	Attit-W .59*	Attit-U .46 (.0115)		Potential to join	.0967	.0339	.2375
Clarity .77*	EOUW.46 (.0020)	Attit-W .56*	Pride .24 (.0002)	Attit-U.46 (.0115)	Potential to join	.0217	.0062	.0592

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 8. 18 Summary of the significant indirect effect paths (Clarity construct)**

The serial multiple mediator model was adapted to examine P4 (and its sub-propositions) and the proposed framework shown in Figure 8.7. The main assumption of this model was that one mediator causally influenced another (Hayes, 2013). Therefore, the order of constructs was carefully considered when entering them for the mediation process.

*P4a: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards website) and brand (pride and attitudes towards brand) mediate the relationships between the clarity construct and both propensity to leave and potential to join constructs.*

The first sub-proposition (P4a) examined the relationships between the clarity construct, as an antecedent, and both potential to join and propensity to leave constructs, as outcomes mediated by the constructs related to the website and brand. As the maximum number of mediators used each time was four, the mediation process was conducted a number of times to include all these mediators. For example, the first mediation model/process included clarity as an antecedent, potential to join as an outcome and hedonic characteristics, usefulness, attitude towards website and pride constructs as mediators. The second mediation process included clarity as an antecedent, potential to join as an outcome and hedonic characteristics, usefulness, attitude towards website and attitude towards brand constructs as mediators. Twenty-four total mediation processes were used for clarity and both potential to join and propensity to leave constructs. The indirect effects were found in the SPSS PROCESS output along with the 95% bias-corrected bootstrap confidence intervals based on 10,000 bootstrap samples (Hayes, 2013). As too many paths/indirect effects options emerged from the mediation processes, Table 8.18 includes only the significant paths which are in line with the proposed framework. The number located underneath the construct name presents the estimated effect of that construct on the next construct. For instance, 'Clarity .55\*' means that the direct effect between the clarity construct and hedonic characteristics construct were significantly .55, and the direct effect

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between the hedonic characteristics construct and attitude towards website construct, in the same path, was significantly .67.

The first indirect effect, in Table 8.18, is the specific indirect effect of clarity on potential to join through hedonic characteristics, attitude towards website and attitude towards brand, estimated as total indirect effect =  $0.55(0.67) (0.99) (.56) = .2036$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval is entirely above zero (0.0909 to 0.4053). This path indicated that the clarity of condition would increase the hedonic characteristics construct (because .55 is positive); this increase was associated with an enhancement in the attitude towards the website. The improvement of attitude towards the website was linked with an enhanced attitude towards brand which, in turn, increased the potential to join the brand. The remaining indirect effects in Table 8.18 can be interpreted in a similar fashion as the first indirect effect. As displayed in Table 8.18, some values of the coefficients (direct effect) are greater than 1. For example, the direct effect between usefulness and attitude towards the website constructs, in two cases, was significantly 1.05 ( $p = .0000$ ). This might indicate multicollinearity. Checking the tolerance level and variance inflation factor (VIF) for all these cases demonstrated that each of these constructs (predictors) had a tolerance level above .1 (.170 and .335) and VIF less than 10 (5.897 and 2.986), indicating no multicollinearity (Howitt & Cramer, 2011). Table 8.18 is divided into three main sections; each shows the paths on which the clarity construct has a direct effect in terms of the hedonic characteristics, recall information and ease of using the website constructs. Finally, no paths presenting the indirect effect between the clarity construct and propensity to leave, through the same mediators used with the potential to join construct, were statistically significant. Therefore, not all of these paths are shown in Table 8.18.

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
Assistance .35 (.0118)	Hedonic .66*	Attit-W .99*	Attit-U .53 (.0025)		Potential to join	.1243	.0317	.3126
Assistance .35 (.0118)	Hedonic .23*	Usefulness .65*	Attit-W .99*	Attit-U .53 (.0025)	Potential to join	.0281	.0061	.0928
Assistance .35 (.0118)	Hedonic .23*	Usefulness .24 (.0257)	Attit-U .43 (.0046)		Potential to join	.0084	.0011	.0367
Assistance .35 (.0118)	Hedonic .23*	Usefulness .40 (.0050)	Pride .39*	Attit-U .43 (.0046)	Potential to join	.0055	.0010	.0224
Assistance .35 (.0118)	Hedonic .81*	Attit-W .68*	Attit-U .47 (.0092)		Potential to join	.0931	.0238	.2533
Assistance .35 (.0118)	Hedonic .81*	Attit-W .63*	Pride .23 (.0002)	Attit-U .47 (.0092)	Potential to join	.0205	.0040	.0732
Assistance .67*	Recall I .34 (.0005)	Attit-W .73*	Attit-U .52 (.0026)		Potential to join	.0880	.0279	.2539
Assistance .67*	Recall I .38*	Usefulness .91*	Attit-W .73*	Attit-U .52 (.0026)	Potential to join	.0876	.0332	.2218
Assistance .67*	Recall I .38*	Usefulness .90 (.0344)	Attit-U .43 (.0013)		Potential to join	.0320	.0049	.0983
Assistance .67*	Recall I .38*	Usefulness .32 (.0623)	Pride .51*	Attit-U .43 (.0013)	Potential to join	.0173	.0016	.0522
Assistance .67*	Recall I .66*	Attit-W .58*	Attit-U .47 (.0097)		Potential to join	.1245	.0501	.2759
Assistance .67*	Recall I .66*	Attit-W .42*	Pride .25 (.0002)	Attit-U .47 (.0097)	Potential to join	.0220	.0088	.0585
Assistance .48*	EOUW .22 (.0273)	Attit-W .51*	Pride .23 (.0490)		Potential to join	.0126	.0005	.0685
Assistance .48*	EOUW .22 (.0273)	Attit-W .76*	Attit-U .53 (.0022)		Potential to join	.0426	.0074	.1334
Assistance .48*	EOUW .33*	Usefulness 1.127*	Attit-W .76*	Attit-U .53 (.0022)	Potential to join	.0715	.0277	.1741
Assistance .48*	EOUW .33*	Usefulness .26 (.0060)	Attit-U .42 (.0015)		Potential to join	.0241	.0070	.0391
Assistance .48*	EOUW .33*	Usefulness .67*	Pride .55*	Attit-U .42 (.0015)	Potential to join	.0244	.0094	.0906
Assistance .48*	EOUW .59*	Attit-W .59*	Attit-U .47 (.0092)		Potential to join	.0794	.0271	.2049
Assistance .48*	EOUW .59*	Attit-W .54*	Pride .24 (.0002)	Attit-U .47 (.0092)	Potential to join	.0174	.0057	.0530

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 8. 19 Summary of the significant indirect effect paths (assistance construct)**

*P4b: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the assistance construct and both potential to join and propensity to leave constructs.*

The second sub-proposition (P4b) examined the relationships between the assistance construct, as an antecedent, and both potential to join and propensity to leave constructs, as outcomes mediated by the constructs related to the website and brand. The first indirect effect, in Table 8.19, is the specific indirect effect of assistance on potential to join through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $0.35(0.66) (0.99) (.53) = .1243$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval was entirely above zero (0.0317 to 0.3126). This path indicated that the assistance role of condition would increase the hedonic characteristics (because .35 is positive), which was associated with an enhancement in the attitude towards the website. The improved attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the potential to join the brand. Again, as displayed in Table 8.19, some values of the coefficient (direct effect) were greater than 1. For example, the direct effect between usefulness and attitude towards the website constructs, in one case, was significantly 1.13 ( $p = .0000$ ) which might indicate multicollinearity. The tolerance level and VIF for all these cases showed that each of these constructs (predictors) had a tolerance level above .1 (.166) and VIF less than 10 (6.009), indicating no multicollinearity (Howitt & Cramer, 2011). The rest of the indirect effects in Table 8.19 can be interpreted in a similar manner as the first indirect effect. Table 8.19 is also divided into three main sections because each one shows the paths on which the assistance construct has a direct effect for one of the hedonic characteristics, recall information and ease of using the website constructs. Finally, as with the clarity construct, not all paths which presented the indirect effect between the assistance construct and propensity to leave, through the same mediators used with the

potential to join construct, were statistically significant. Therefore, not all of these paths are shown in Table 8.19.

*P4c: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the control construct and both propensity to leave and potential to join constructs.*

The third sub-proposition (P4c) examined the relationships between the control construct, as an antecedent, and both potential to join and propensity to leave constructs, as outcomes mediated by the constructs related to the website and brand. The first indirect effect, in Table 8.20, is the specific indirect effect of control on potential to join through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $(0.60)(0.81)(0.68)(.51) = .1685$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval was entirely above zero (0.0653 to 0.3541). This path indicated that the control information in the condition would increase the hedonic characteristics (because .60 is positive), which was associated with an enhancement in the attitude towards the website. The improved attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the potential to join the brand. Again, as displayed in table 8.20, some values of the coefficient (direct effect) are greater than 1. For example, the direct effect between usefulness and attitude towards the website constructs, in two cases, was significantly 1.06 ( $p = .0000$ ), which might indicate multicollinearity. For all these cases, each of these constructs (predictors) had a tolerance level above .1 (.171 and .328) and VIF less than 10 (5.850 and 3.051), indicating no multicollinearity (Howitt & Cramer, 2011). The rest of the indirect effects in Table 8.20 can be interpreted in a similar fashion as the first indirect effect.

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
Control .60*	Hedonic .81*	Attit-W .68*	Attit-U .51 (.0049)		Potential to join	.1685	.0653	.3541
Control .60*	Hedonic .81*	Attit-W .71*	Pride .24 (.0002)	Attit-U .51 (.0047)	Potential to join	.0413	.0119	.1115
Control .60*	Hedonic .17 (.0005)	Usefulness .33 (.0019)	Attit-U .50*		Potential to join	.0164	.0037	.0542
Control .60*	Hedonic .17 (.0005)	Usefulness .57*	Pride .38*	Attit-U .50*	Potential to join	.0107	.0029	.0346
Control .60*	Hedonic .68*	Attit-W .65 (.0006)	Pride .25 (.0335)		Potential to join	.0656	.0079	.2051
Control .60*	Hedonic .17 (.0005)	Usefulness .75*	Attit-W .65 (.0006)	Pride .25 (.0335)	Potential to join	.0121	.0014	.0487
Control .60*	Hedonic .68*	Attit-W .99*	Attit-U .55 (.0014)		Potential to join	.2263	.0999	.392
Control .60*	Hedonic .17 (.0005)	Usefulness .75*	Attit-W .99*	Attit-U .55 (.0014)	Potential to join	.0418	.0137	.1116
Control .87*	Recall I .73*	Attit-W .58*	Attit-U .54 (.0028)		Potential to join	.1962	.0920	.3850
Control .87*	Recall I .73*	Attit-W .43*	Pride .23 (.0002)	Attit-U .54 (.0028)	Potential to join	.0366	.0137	.0820
Control .87*	Recall I .37*	Usefulness .29 (.0274)	Attit-U .46 (.0005)		Potential to join	.0432	.0061	.1228
Control .87*	Recall I .37*	Usefulness .43 (.0062)	Pride .48*	Attit-U .46 (.0005)	Potential to join	.0310	.0109	.0809
Control .87*	Recall I .41 (.0002)	Attit-W .71*	Attit-U .61 (.0004)		Potential to join	.1529	.0640	.3454
Control .87*	Recall I .37*	Usefulness .86*	Attit-W .71*	Attit-U .61 (.0004)	Potential to join	.1214	.0500	.2677
Control .87*	Recall I .41 (.0002)	Attit-W .40*	Pride .28 (.0169)		Potential to join	.0402	.0070	.1340
Control .87*	Recall I .37*	Usefulness .86*	Attit-W .40*	Pride .28 (.0169)	Potential to join	.0319	.0064	.1027
Control .63*	EOUW .53*	Attit-W .60*	Attit-U .51 (.0041)		Potential to join	.1034	.0407	.2273
Control .63*	EOUW .53*	Attit-W .56*	Pride .25 (.0001)	Attit-U .51 (.0041)	Potential to join	.0235	.0082	.0612
Control .63*	EOUW .28*	Usefulness .35 (.0066)	Attit-U .43 (.0010)		Potential to join	.0260	.0073	.0680
Control .63*	EOUW .28*	Usefulness .73*	Pride .55*	Attit-U .43 (.0010)	Potential to join	.0296	.0119	.0698
Control .63*	EOUW .24 (.0242)	Attit-W .49*	Pride .26 (.0267)		Potential to join	.0190	.0024	.0655
Control .63*	EOUW .28*	Usefulness 1.06*	Attit-W .49*	Pride .26 (.0267)	Potential to join	.0231	.0044	.0717
Control .63*	EOUW .24 (.0242)	Attit-W .75*	Attit-U .58 (.0006)		Potential to join	.0657	.0133	.1719
Control .63*	EOUW .28*	Usefulness 1.06*	Attit-W .75*	Attit-U .58 (.0006)	Potential to join	.0798	.0374	.1743

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 8. 20 Summary of the significant indirect effect paths (control construct)**



Table 8.20 is also divided into three main sections because each one shows the paths on which the control construct has a direct effect for one of the hedonic characteristics, recall information and ease of using the website. Finally, as with the clarity and assistance constructs, not all paths which presented the indirect effect between the control construct and propensity to leave, through the same mediators used with the potential to join construct, were statistically significant. Therefore, not all of these paths are shown in Table 8.20.

*P4d: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the competence construct and both propensity to leave and potential to join constructs.*

The next sub-proposition (P4d) examined the relationships between the competence construct, as an antecedent, and both potential to join and propensity to leave constructs, as outcomes mediated by the constructs related to the website and brand. The first indirect effect, in Table 8.21, is the specific indirect effect of competence on potential to join through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $(0.68) (0.76) (0.70) (.51) = .1839$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval was entirely above zero (0.0777 to 0.3538). This path indicated that the competence of the condition would increase the hedonic characteristics (because .68 is positive), which was associated with an enhancement in the attitude towards the website. The improved attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the potential to join the brand. Again, as displayed in table 8.21, some values of the coefficient (direct effect) are greater than 1. For example, the direct effect between usefulness and attitude towards the website constructs, in two cases, was significantly 1.02 ( $p = .0000$ ), which might indicate multicollinearity. Each of these constructs (predictors) had tolerance level above .1 (.302 and .171) and VIF less than 10 (3.316 and 5.856), suggesting no multicollinearity (Howitt & Cramer, 2011).

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
Competence .68*	Hedonic .76*	Attit_W .70*	Attit-U .51 (.0055)		Potential to join	.1839	.0777	.3538
Competence .68*	Hedonic .76*	Attit_W .69*	Pride .24 (.0002)	Attit-U .51 (.0055)	Potential to join	.0431	.0137	.1075
Competence .68*	Hedonic .11 (.0156)	Usefulness .34 (.0029)	Pride .38*	Attit-U .48 (.0018)	Potential to join	.0072	.0015	.0259
Competence .68*	Hedonic .11 (.0170)	Usefulness .55 (.0004)	Attit-U .48 (.0018)		Potential to join	.0118	.0022	.0437
Competence .68*	Hedonic .69*	Attit_W .65 (.0005)	Pride .24 (.0368)		Potential to join	.0741	.0081	.2234
Competence .68*	Hedonic .11 (.0170)	Usefulness .76*	Attit_W .65 (.0005)	Pride .24 (.0368)	Potential to join	.0088	.0007	.0360
Competence .68*	Hedonic .69*	Attit_W .99*	Attit-U .56 (.0014)		Potential to join	.2568	.1206	.4860
Competence .68*	Hedonic .11 (.0170)	Usefulness .76*	Attit_W .99*	Attit-U .56 (.0014)	Potential to join	.0306	.0076	.0925
Competence .87*	Recall I .59*	Attit_W .59*	Attit-U .52 (.0042)		Potential to join	.1589	.0756	.3183
Competence .87*	Recall I .59*	Attit_W .43*	Pride .24 (.0002)	Attit-U .52 (.0042)	Potential to join	.0218	.0115	.0692
Competence .87*	Recall I .29*	Usefulness .29 (.0441)	Attit-U .43 (.0012)		Potential to join	.0308	.0027	.0881
Competence .87*	Recall I .29*	Usefulness .41 (.0159)	Pride .50*	Attit-U .43 (.0012)	Potential to join	.0140	.0050	.0556
Competence .87*	Recall I .35 (.0009)	Attit_W .41*	Pride .27 (.0360)		Potential to join	.0314	.0053	.1237
Competence .87*	Recall I .29*	Usefulness .82*	Attit_W .41*	Pride .27 (.0360)	Potential to join	.0140	.0040	.0827
Competence .87*	Recall I .35 (.0009)	Attit_W .72*	Attit-U .54 (.0007)		Potential to join	.1151	.0493	.3146

Competence .87*	Recall I .29*	Usefulness .82*	Attit_W .72*	Attit-U .59 (.0007)	Potential to join	.0512	.0364	.2015
Competence .70*	EOUW .38 (.0026)	Attit_W .61*	Attit-U .51 (.0050)		Potential to join	.0838	.0258	.2012
Competence .70*	EOUW .38 (.0068)	Attit_W .54*	Pride .25 (.0001)	Attit-U .51 (.0050)	Potential to join	.0185	.0054	.0522
Competence .70*	EOUW .16 (.0139)	Usefulness .35 (.0104)	Attit-U .42 (.0015)		Potential to join	.0166	.0030	.0537
Competence .70*	EOUW .16 (.0139)	Usefulness .68*	Pride .50*	Attit-U .42 (.0015)	Potential to join	.0178	.0029	.0522
Competence .70*	EOUW .22 (.0472)	Attit_W .49*	Pride .25 (.0308)		Potential to join	.0191	.0019	.0676
Competence .70*	EOUW .16 (.0139)	Usefulness 1.02*	Attit_W .49*	Pride .25 (.0308)	Potential to join	.0144	.0016	.0537
Competence .70*	EOUW .22 (.0472)	Attit_W .76*	Attit-U .57 (.0008)		Potential to join	.0665	.0125	.1815
Competence .70*	EOUW .16 (.0139)	Usefulness 1.02*	Attit_W .76*	Attit-U .57 (.0008)	Potential to join	.0504	.0097	.1336

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 8. 21 Summary of the significant indirect effect paths (competence construct)**

The rest of the indirect effects in Table 8.21 can be interpreted in the same way as the first indirect effect. Table 8.21

*P4e: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the convenience construct and both propensity to leave and potential to join constructs.*

Sub-proposition (P4e) examined the relationships between the convenience construct, as an antecedent, and both potential to join and propensity to leave constructs, as outcomes mediated by the constructs related to the website and brand. The first indirect effect, in Table 8.22, is the specific indirect effect of convenience on potential to join through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $(0.60) (0.77) (0.71) (.48) = .1576$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval was entirely above zero (0.0677 to 0.3299). This path indicated that the convenience of the condition would increase the hedonic characteristics (because .60 is positive), which was associated with an enhancement in the attitude towards the website. The improved attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the potential to join the brand. The remaining indirect paths in Table 8.22 can be interpreted in a similar manner as the first indirect effect. Table 8.22 is also divided into three main sections because each one shows the paths on which the convenience construct has a direct effect for one of the hedonic characteristics, recall information and ease of using the website constructs. Finally, as with the previous four constructs, not all paths which presented the indirect effect between the convenience construct and propensity to leave, through the same mediators used with the potential to join construct, were statistically significant and, thus, are not shown in Table 8.22.

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
Convenience .60*	Hedonic .77*	Attit-W .71*	Attit-U .48 (.0106)		Potential to join	.1576	.0677	.3299
Convenience .60*	Hedonic .77*	Attit-W .73*	Pride .23 (.0002)	Attit-U .48 (.0106)	Potential to join	.0369	.0118	.0943
Convenience .60*	Hedonic .13 (.0084)	Usefulness .31 (.0038)	Attit-U .43 (.0030)		Potential to join	.0106	.0015	.0397
Convenience .60*	Hedonic .13 (.0084)	Usefulness .59*	Pride .38*	Attit-U .43 (.0049)	Potential to join	.0076	.0054	.0251
Convenience .60*	Hedonic .68*	Attit-W .61 (.0007)	Pride .26 (.0299)		Potential to join	.0650	.0068	.1941
Convenience .60*	Hedonic .13 (.0084)	Usefulness .69*	Attit-W .61 (.0007)	Pride .26 (.0299)	Potential to join	.0086	.0006	.0348
Convenience .60*	Hedonic .68*	Attit-W .97*	Attit-U .57 (.0015)		Potential to join	.2266	.142	.4259
Convenience .60*	Hedonic .13 (.0084)	Usefulness .69*	Attit-W .97*	Attit-U .57 (.0015)	Potential to join	.0298	.0072	.0857
Convenience .77*	Recall I .59*	Attit-W .61*	Attit-U .48 (.0099)		Potential to join	.1320	.0548	.2777
Convenience .77*	Recall I .59*	Attit-W .45*	Pride .22 (.0005)	Attit-U .48 (.0099)	Potential to join	.0216	.0075	.0722
Convenience .77*	Recall I .34*	Usefulness .43 (.0066)	Pride .49*	Attit-U .41 (.0024)	Potential to join	.0233	.0072	.0629
Convenience .77*	Recall I .32 (.0030)	Attit-W .42*	Pride .26 (.0355)		Potential to join	.0268	.0017	.1043
Convenience .77*	Recall I .34*	Usefulness .77*	Attit-W .42*	Pride .26 (.0355)	Potential to join	.0233	.0018	.0769
Convenience .77*	Recall I .32 (.0030)	Attit-W .73*	Attit-U .57 (.0016)		Potential to join	.1014	.0304	.2469
Convenience .77*	Recall I .34*	Usefulness .77*	Attit-W .73*	Attit-U .57 (.0016)	Potential to join	.0844	.0301	.2054
Convenience .62*	EOUW .38 (.0031)	Attit-W .62*	Attit-U .48 (.0099)		Potential to join	.0701	.0222	.1696
Convenience .62*	EOUW .38 (.0031)	Attit-W .57*	Pride .24 (.0001)	Attit-U .48 (.0099)	Potential to join	.0154	.0040	.0450
Convenience .62*	EOUW .22 (.0026)	Usefulness .31 (.0156)	Attit-U .40 (.0028)		Potential to join	.0168	.0017	.0520
Convenience .62*	EOUW .22 (.0026)	Usefulness .72*	Pride .55*	Attit-U .40 (.0028)	Potential to join	.0212	.0072	.0574
Convenience .62*	EOUW .22 (.0026)	Usefulness .96*	Attit-W .49*	Pride .26 (.0262)	Potential to join	.0168	.0020	.0517
Convenience .62*	EOUW .22 (.0026)	Usefulness .96*	Attit-W .76*	Attit-U .57 (.0013)	Potential to join	.0555	.0204	.1333

\* P= .0000 each number is the amount of coefficient of the construct with the next on

**Table 8. 22 Summary of the significant indirect effect paths (Convenience construct)**

*P4f: The constructs related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and brand (pride and attitudes towards brand) mediate the relationships between the communication construct and both propensity to leave and potential to join constructs.*

The final sub-proposition (P4f) examined the relationships between the communication construct, as an antecedent, and both potential to join and propensity to leave constructs, as outcomes mediated by the constructs related to the website and brand. The first indirect effect, in Table 8.23, is the specific indirect effect of communication on potential to join through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $(0.21)(0.66)(0.97)(.59) = .0786$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval was entirely above zero (.0153 to .1819). This path indicated that the communication construct would increase the hedonic characteristics (because .21 is positive), which was associated with an enhancement in the attitude towards the website. The improved attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the potential to join the brand. Again, as displayed in table 8.23, some values of the coefficient (direct effect) are greater than 1. For example, the direct effect between usefulness and attitude towards the website constructs, in two cases, was significantly 1.09 ( $p = .0000$ ), which might indicate multicollinearity. Each of these constructs (predictors) had a tolerance level above .1 (.170 and .312) and VIF less than 10 (5.886 and 3.208), meaning there was no multicollinearity (Howitt & Cramer, 2011). The rest of the indirect effects in Table 8.23 can be interpreted in the same way as the first indirect effect. Table 8.23 is also divided into three main sections because each one shows the paths on which the communication construct has a direct effect for one of the hedonic characteristics, recall information and ease of using the website constructs. Finally, as with the previous constructs, not all paths which presented the indirect effect between the communication construct and propensity to leave, through the same mediators used with the potential to join construct, were statistically significant and, thus, are not shown in Table 8.23.

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
Communication .21 (.0211)	Hedonic .66*	ATTW .97*	ATTU .59 (.0004)		Potential to join	.0786	.0153	.1819
Communication .21 (.0211)	Hedonic .26*	Usefulness .71*	ATTW .97*	ATTU .59 (.0004)	Potential to join	.0219	.0032	.0636
Communication .21 (.0211)	Hedonic .26*	Usefulness .33 (.0006)	ATTU .58 (.0001)		Potential to join	.0102	.0015	.0339
Communication .21 (.0211)	Hedonic .26*	Usefulness .50 (.0001)	Pride .39*	ATTU .58 (.0001)	Potential to join	.0061	.0011	.0202
Communication .21 (.0211)	Hedonic .85*	ATTW .66*	ATTU .59 (.0004)		Potential to join	.0674	.0123	.1609
Communication .21 (.0211)	Hedonic .85*	ATTW .71*	Pride .25 (.0001)	ATTU .58 (.0011)	Potential to join	.0179	.0029	.0550
Communication .47*	Recall I .45*	ATTW .69*	ATTU .67 (.0001)		Potential to join	.0967	.0419	.2283
Communication .47*	Recall I .46*	Usefulness .84*	ATTW .69*	ATTU .67 (.0001)	Potential to join	.0836	.0333	.1828
Communication .47*	Recall I .45*	ATTW .42*	Pride .25 (.0329)		Potential to join	.0219	.0029	.0764
Communication .47*	Recall I .46*	Usefulness .84*	ATTW .42*	Pride .25 (.0329)	Potential to join	.0189	.0026	.0709
Communication .47*	Recall I .45*	Usefulness .28 (.0185)	ATTU .59*		Potential to join	.0359	.0053	.0923
Communication .47*	Recall I .45*	Usefulness .38 (.0120)	Pride .47*	ATTU .59*	Potential to join	.0229	.0057	.0577
Communication .47*	Recall I .83*	ATTW .55*	ATTU .62 (.0004)		Potential to join	.1334	.0672	.2530
Communication .47*	Recall I .83*	ATTW .43*	Pride .25 (.0001)	ATTU .62 (.0004)		.0259	.0093	.0639
Communication .35*	EOUW .71*	ATTW .58*	ATTU .59 (.0009)		Potential to join	.0859	.0428	.1620
Communication .35*	EOUW .71*	ATTW .58*	Pride .26*	ATTU .59 (.0009)	Potential to join	.0223	.0086	.0525
Communication .35*	EOUW .39*	Usefulness .38 (.0013)	ATTU .54		Potential to join	.0283	.0094	.0648
Communication .35*	EOUW .39*	Usefulness .72*	Pride .55*	ATTU .54	Potential to join	.0299	.0145	.0582
Communication .35*	EOUW .29 (.0054)	ATTW .52*	Pride .22 (.0587)		Potential to join	.0114	.0007	.0454
Communication .35*	EOUW .39*	Usefulness 1.09*	ATTW .52*	Pride .22 (.0587)	Potential to join	.0170	.0007	.0575
Communication .35*	EOUW .29 (.0054)	ATTW .74*	ATTU .62 (.0002)		Potential to join	.0463	.0129	.1192
Communication .35*	EOUW .39*	Usefulness 1.09*	ATTW .74*	ATTU .62 (.0002)	Potential to join	.0693	.0333	.1339

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 8. 23 Summary of the significant indirect effect paths (Communication construct)**

**8.7 Chapter summary**

This chapter first presented the experimental design for study one, including the design of the study, participants' characteristics, materials used during the experiments and procedures followed to conduct these experiments. The next sections related to the data analysis and results, starting with a preliminary data analysis focused on the accuracy of the data file, missing data, testing outliers and normality. CFA techniques was used for the items, and tests of convergent validity, composite reliability and discriminant validity were also conducted. After that, the common method bias technique was adapted using the marker variable. The last section in the data analysis included in this chapter addressed the testing of the Propositions. Two main techniques were used: repeated measures ANOVA and the serial multiple mediator model. The results from the analysis will be discussed in detail in Chapter Ten. First, Chapter Nine will address the second experimental design study and its data analysis and results.



**Chapter Nine:**  
**Experimental design study and quantitative data analysis and results:**  
**Study two: admin-avatar condition and language factors**

**9.1 Introduction**

Chapter Eight presented the experimental design and analysis of study one which examined the differences of three conditions, admin-avatar and admin-avatar based on text (as manipulated variables) and written information (as the control variable), on a number of constructs (related to the condition itself (antecedents), consequences related to the website, and consequences related to the brand). After cleaning the data, a comprehensive data analysis was carried out to test propositions. This chapter presents the design of the second experimental study and subsequent data analysis. This study also examines similar constructs used in the first experimental study. Specifically, the data analysis includes a preliminary data analysis (accuracy of data file, data missing, testing outliers and normality), confirmatory factor analysis (CFA), convergent validity, reliability, discriminant validity and common method bias (CMB or CMV). In addition, it shows the tests of the propositions using three main techniques: factorial design (two-way independent ANOVA), the serial multiple mediator model and moderation model. Figure 9.1 shows the Chapter Nine map.

**9.2 Experimental design: factorial design**

The second experimental study aims to examine whether the effect of the admin-avatar condition (based on text or not) and its language significantly differ on the different dimensions, users' attitudes and behaviours. It also aims to examine the impact of the different dimensions (anthropomorphism, clarity, control, convenience) on the outcomes, such as word of mouth, feedback and recommendation, mediated by consequences related to the website (hedonic characteristics, recall information, ease of using the website, social presence, usefulness and attitude towards the website) and consequences related to brand

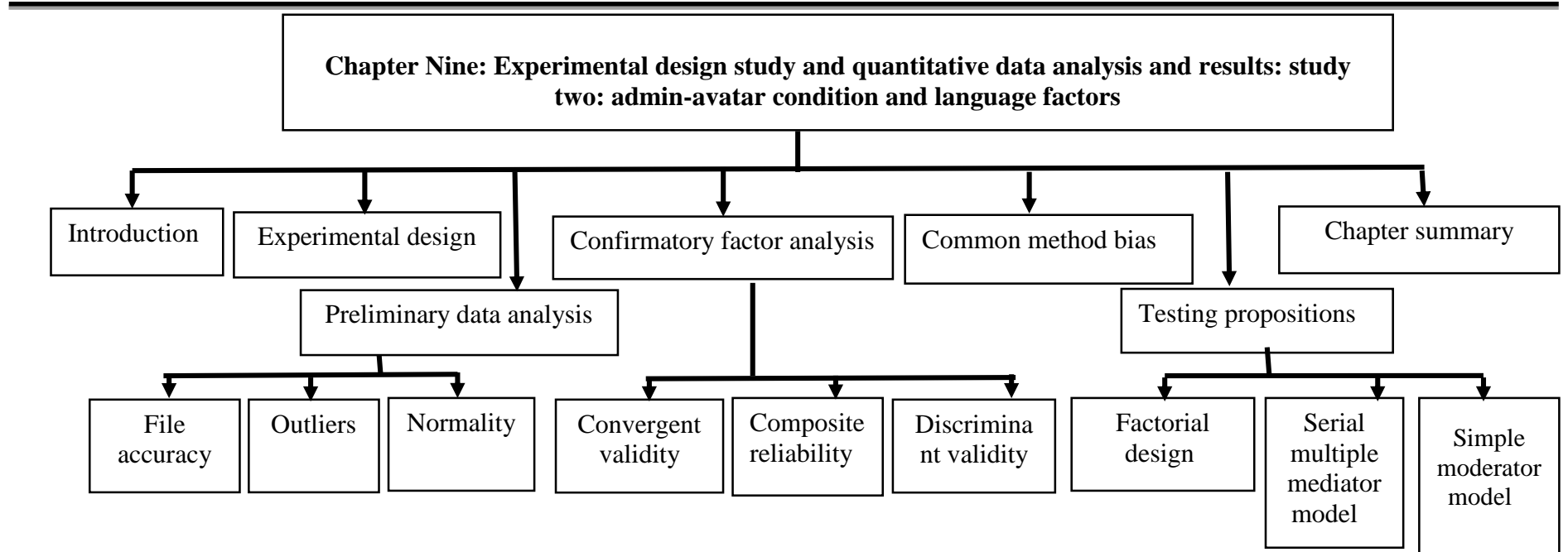


Figure 9. 1 Chapter Nine map

(attitude towards brand). Finally, it examines whether the familiarity of the admin-avatar moderates the relationships between the different dimensions and the consequences related to the website, particularly hedonic characteristics, recall information, ease of using the website and social presence.

### 9.2.1 Design

The adapted design for this study was 2×2 factorial design. This study manipulated two main factors (two independent variables): the admin-avatar condition and admin-avatar language. The first factor included two levels: admin-avatar and admin-avatar based on text. The second factor included two levels: English language (formal language) and user's own language (native language/mother tongue). Figure 9.2 shows the four different conditions in the design of this study. Four student groups participated in this study; each participant was exposed to only one condition and took approximately 20 minutes to finish the experiment. The same fictitious brand from study one was used to exclude other effects which may appear, such as the brand loyalty, thereby leading to more valid results (Jin, 2009). The fictitious name used in the experiments was 'University of Gloucester'.

Admin- avatar language	English	Admin-avatar + English language	Admin-avatar based on text + English
	Own	Admin-avatar + own language	Admin-avatar based on text + own
		Admin-avatar	Admin-avatar based on text
		Admin-avatar condition	

**Figure 9. 2 Study two design**

### 9.2.2 Participants

One hundred fifty-one students drawn from the University of Hull student population participated in the experiment. Questionnaires from 16 participants were dropped for not being valid (the reasons for deleting these questionnaires are discussed in more detail in the preliminary data analysis section). The number of participants in each group was 33 (admin-avatar in English language condition), 35 (admin-avatar based on text in English language condition), 34 (admin-avatar in own language condition) and 33 (admin-avatar based on text in own language condition). Approximately 70% of the participants were between 18 and 35 years old; 43 were female. In addition, 34% of all participants were undergraduates, 63% were postgraduates, and only 3% were in a pre-session course. Table 9.1 shows participants' native languages as well. Participants received £4 as motivation for participating in the study.

	A	B	C	D	Total	%
<b>Total sample</b>					151	
<b>Valid</b>					135	100
<b>Gender</b>						
Male	25	26	20	21	92	68.15
Female	8	9	14	12	43	31.85
<b>Age</b>						
18-25	18	17	7	6	48	35.56
26-35	9	5	17	15	46	34.07
36-45	6	12	10	11	39	28.89
46-55	-	1	-	1	2	1.48
<b>Degree</b>						
Undergraduate	19	18	3	6	46	34.08
Postgraduate	14	16	29	26	85	62.96
Other	-	1	1	2	4	2.96
<b>Native language</b>						
Arabic	5	5	25	26	61	45.19
Chinese	1	3	9	7	20	14.81
English	15	12	-	-	27	20.00
Other	12	15	-	-	27	20.00

A (admin-avatar condition in English language), B (admin-avatar condition based on text in English language), C (admin-avatar in own language) and D (admin-avatar based on text in own language condition)

**Table 9. 1 Sample characteristics (study two)**

### ***9.2.3 Materials***

A website for the University of Gloucester was developed by a professional website developer. Each webpage included some information about the brand, particularly study topics (programmes) and frequently asked questions (FAQ). Each webpage was designed and/or programmed with one specific condition of providing information (admin-avatar or admin-avatar based on text) as stimuli. In addition, the information on these webpages was provided in English as default, and there was an option to change the language into Arabic or Chinese. The reason for translating the information into these two specific languages was that the number of Arab and Chinese students at the University of Hull was large. Thus, data collected from these groups might be more representative of university students than other groups/languages.

Instructions files were prepared and printed to give to participants in the experiment sessions (see Appendixes F.2 to F.5). As in study one, two specific computer rooms in the University of Hull were booked to conduct all the experiment sessions. The participants were organised so that there was an unused PC between every two participants. The headsets were brought in and attached to the PCs. Furthermore, envelopes were bought for the money/incentives. An online questionnaire was also used in this experiment. Ethical approval and informant consent for this study were obtained from the Ethics Committee of the Hull University Business School, University of Hull.

### ***9.2.4 Procedures***

For this experiment, most participants booked their places in advance after receiving an email with the available times. Some students sitting in nearby rooms during the experiment sessions were asked to participate in the experiment. Two instructors (the researcher and an assistant) attended each session to manage the session. The researcher met the assistants before conducting the experimental sessions and explained the procedures and what they

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should do during the sessions. When the participants came to the computer rooms, they signed the attendance sheet and consent form (see Appendix D.2). Each participant received a general instruction sheet and specific file which included the main instructions for the experiments. The randomisation issue was taken into consideration to achieve a true score and reduce the error (Field & Hole, 2010). Participants were assigned randomly. For example, the first participant who sent an email for participation and who was not a native Arabic or Chinese speaker was assigned to group A. The second participant who sent an email for participation and was not an Arabic or Chinese speaker was assigned in group B. The third participant who sent an email for participation and whose native tongue was not Arabic or Chinese was assigned in group A. This process continued until all participants were assigned to a group. The same procedure was used for groups C and D; these groups included Arabic and Chinese speakers, although some Arab and Chinese students did participate in groups A and B. After receiving the instructions file, the participant headed to the assigned PC to start reading and following the instructions (see Appendixes F2 to F5). After following the instructions, the participant used a link to the questionnaire and filled it out based on the condition to which s/he was exposed.

### **9.3 Preliminary data analysis**

#### ***9.3.1 Accuracy of data file***

Specific actions were taken to safeguard the accuracy of the data file, such as proofreading the original data against the computerised data. No difference was found between the versions. The univariate descriptive statistics — namely IBM SPSS frequencies — were used for two main reasons. First, it ensured that all cases were categorised into one of the four conditions (A, B, C or D). This action resulted in some small edits being made on the condition item, such as adding a dash between *admin* and *avatar* in some cases and using capitalisation consistently. Nine questionnaires were dropped because they were not completed. Two participants wrote different words than the four options (admin-avatar

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condition in English language, admin-avatar condition based on text in English language, admin-avatar in own language or admin-avatar based on text in own language condition). Second, the approach adopted was used to verify that participants answered two items — ‘Please select the middle answer’ and ‘If you read this item, please select Strongly Agree as a response to this question’ — correctly to check whether they read the questionnaire carefully. This action resulted in dropping five additional questionnaires. Furthermore, some values in some of the scales of the continuous variables were not within the given range. After reviewing these scales, it was found that exporting the responses from the Qualtrics website into the SPSS file resulted in to some changes. For example, some scales ranged between strongly disagree (1) and strongly agree (7). For some items, it was found agree was indicated by 9 instead of 6, strongly agree by 10 instead of 7, etc. All items and responses were carefully reviewed and changed to reflect the appropriate number. Finally, the scale of revised items was changed to reflect the real scores (six items for the social presence construct).

### ***9.3.2 Missing data***

There were no data missing because the data were collected using a web-based questionnaire where participants were required to answer all the items on the screen before proceeding to the next page.

### ***9.3.3 Testing for outliers***

As mentioned in Chapter Five, two methods can be used to detect potential outliers. First, using z-scores, the findings revealed that the majority of cases were below  $\pm 3.29$  z-scores ( $p < 0.001$ ), indicating the absence of significant outliers (Hair et al., 2010). More precisely, the findings identified 11 cases (1, 4, 17, 40, 48, 82, 90, 92, 95 and 134) with different negative z-scores exceeding 3.29, as shown in Table 9.2. In line with Hair et al. (2010),

these outliers were noted and should be retained unless demonstrable evidence indicates they are unrepresentative of any observations in the population.

Item	Case number	Z score
The {condition name} is unapparent..... apparent	4	-3.532
The {condition name} is not obvious..... obvious	48	-3.746
The {condition name} is unclear..... clear	17	-4.004
The {condition name} is unclear concerning the language ..... Clear concerning the language	92	-4.041
The {condition name} is unclear concerning the organisation of information..... Clear concerning the organisation of information	1 134	-3.530 -3.530
It is easy to deal with the {condition name}.	40 82	-4.332 -3.431
The {condition name} is different.	90	-3.43
The {condition name} provides relevant information.	48 90	-4.29 -3.332
The {condition name} does a good job of presenting the information.	48 90	-3.761 -3.761
I can remember the information provided by {condition name} easily.	90 95	-3.420 -3.420
Helpful	48 90 95	-3.404 -3.404 -3.404
Advanced	90 95	-3.373 -3.373
Technologically developed	90 95	-3.701 -3.701
Adapting new ways	4 90 95	-3.704 -3.704 -3.704
Looking forward to change	90 95	-3.603 -3.603
Innovative	90 95	-3.849 -3.849
Modern	90 95	-3.811 -3.811
Only if they provide feedback section in easy way (e.g. multiple choice questions).	1 95	-3.396 -3.396
Say positive things about the University of Gloucester to other people.	90	-3.526

**Table 9. 2 Assessment of outliers using z-scores**

Second, further detection of outliers using boxplots led to the identification of additional outliers, as shown in Table 9.3. Generally, outliers detected were retained as they did not



appear to be unique or representative of the population. In other words, it is normal to find participants who extremely agree or disagree with these items.

Item	Case number
The {condition name} is unapparent..... apparent	4, 108, 111, 129,131, 134
The {condition name} is indistinct..... distinct	12, 49, 62, 91, 103, 106, 117, 119, 131
The {condition name} is not obvious..... obvious	49
The {condition name} is vague.....well-defined	21, 53,63, 107, 108, 117, 131
The {condition name} is unclear..... clear	17
The {condition name} is unclear concerning the language ..... Clear concerning the language	10, 41, 46, 84, 97, 106
The {condition name} is unclear concerning the organisation of information..... Clear concerning the organisation of information	1, 134
Adding {condition name} to the website makes it complicated..... not complicated	19, 49, 64
Adding {condition name} to the website makes it requires a lot of effort to use... Does not require a lot of effort to use.	90
It is easy to deal with the {condition name}	10, 41,47, 50, 82,85, 87, 92, 95, 105, 108, 119, 126, 129, 135
{Condition name} convenient for me to get the required information.	41, 49, 50, 71, 82, 90, 92, 107, 119, 132
It would not take much time to get the information from {Condition name}.	79, 85, 89, 90, 91, 92, 94, 108, 125
The time required to receive the required information is appropriate.	9, 82, 90, 91, 94, 117, 119, 129, 132
I am able to get to the information from {condition name} quickly.	9,82, 90, 91, 94, 99, 108, 119, 132
Different from my expectations of other styles (e.g. text).	42, 72, 107, 108
Memorable.	9, 24, 74, 89, 94, 104, 106, 107, 108, 118
Different.	27, 72, 74, 84, 90, 95, 107, 117, 118
Friendly.	9, 11, 28, 31, 90, 91, 95, 100, 119, 128
Agreeable.	8, 9, 49, 50, 90, 91, 95, 118, 119
Increases my attention when browsing.	36, 41, 42, 49, 50, 91, 94, 102, 104, 106
Provides relevant information.	49, 50, 91, 95, 113, 117
Does a good job of presenting the information.	9, 23, 32, 49, 91, 108, 113
I can remember the -core information on the topics provided by { condition name }	49, 71, 90, 94, 104, 106, 111, 120, 122, 132
I can remember the University of Gloucester website because of adding the {condition name}.	37, 66, 71, 104, 105
I can remember the information provided by {condition name} easily.	9, 37, 49, 89, 90, 94, 108, 131

I can remember the University of Gloucester because of the {condition name}.	37, 66, 71, 104, 105
Helpful	9, 37, 49, 89, 90, 94, 108, 131
Advanced	20, 33, 50, 66, 71, 90, 95, 104, 119,120
Technologically developed	16, 49, 94, 95, 104, 105, 119
Adapting new ways	15, 44, 90, 91, 95, 117, 119, 131
Looking forward to change	90, 91, 95, 119
Innovative	4, 90, 95
Modern	10,32, 90, 95, 119
Only if they provide section for that on the website.	16, 33, 49, 78, 88, 93, 94, 99, 100, 104
Only if they provide feedback section in easy way (e.g. multiple choice questions).	1, 16, 33, 71, 78, 93, 94, 95, 111

**Table 9. 3 Assessment of outliers using boxplots**

### 9.3.4 Test of normality

In line with Stevens' (1992) suggestions, the normality assumptions were initially examined through skewness and kurtosis. The results of this test showed that the positive skewness values ranged from .114 to 0.851 and the negative values ranged from -.017 to -1.554. Positive kurtosis values ranged from .007 to 3.263, and negative kurtosis values ranged from -.060 to -1.185. As mentioned in Chapter Five, when the values of skewness and kurtosis are zero, distribution is normal (Tabachnick & Fidell, 2013). According to Curran et al. (1996), having skewness and kurtosis values under 2 and 7, correspondingly shows that the data distribution is more or less normally distributed. In addition, the normality assumption was measured using Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) tests. The results of both tests presented that, as shown in Appendix H.2, all items were significant ( $p < 0.05$ ), representing the deviation from normality (for more details about some points which can be raised that might interpret the results of non-normality of items using K-S and S-W tests, see section 8.3.4).

#### 9.4 Confirmatory factor analysis, convergent validity, reliability and discriminant validity

The relevant constructs were split into three sets of theoretically related variables: antecedents and moderator, consequences related to the admin-avatar and the website and consequences related to the brand. This is in line with Baker and Sinkula's (1999) reasoning (see section 8.5). Therefore, this section is divided into three main subsections which each show the CFA, convergent validity, reliability and discriminant validity for each set of related variables. Table 9.4 shows a summary of the three models analysed using the CFA.

Measurement model (part of model)	CMIN/DF	CMIN	P	GFI	AGFI	CFI	TLI	RMSEA
<b>Model one: antecedents and moderator</b>	1.280	120.347	.035	.900	.855	.966	.956	.046
<b>Model two consequences related to the website (attitude toward website as a second order construct)</b>	1.258	168.537	.023	.883	.834	.975	.975	.044
<b>Model three: consequences related to the brand (attitude toward brand as a second order construct)</b>	1.217	82.760	.107	.923	.881	.986	.981	.040

**Table 9.4 Summary of the three models conducted by CFA**

##### 9.4.1 Output of model one: the antecedents and moderator

A 27-item, five-factor model was estimated using AMOS 22. The assessment of model fit revealed that the  $\chi^2(314) = 544.982$ ,  $p = .000$ , GFI = .779, CFI = .845, TLI = .827 and RMSEA = .074, indicating the model was not fit. An inspection of the modification indices (MIs) revealed that 11 items were candidates for removal. This iterative process ended with a 16-item five-factor model. Model fit was improved as shown in Table 9.4:  $\chi^2(94) = 120.347$ ,  $p > .001$ , GFI = .900, CFI = .966, TLI = .956 and RMSEA = .046. The number of degrees of freedom satisfied the assumed criterion ( $1.280 < 2$ ), which indicates that the quality of the model is good. The resulting measurement model is shown in Figure 9.3. The improved (16-item) confirmatory factor model included three convenience items, four clarity items, three anthropomorphism items, three familiarity items, and three control items. The standardised and unstandardised item-loading estimates on their hypothesised

dimensions are shown in Appendix I.4. The standardised item-loading estimates ranged from .597 to .881, with  $\chi^2$  values ranging from 5.899 to 10.105 ( $p < 0.001$ ), indicating highly significant item loadings (Appendix I.4).

**Convergent validity and composite reliability:** Four criteria were used to evaluate the convergent validity of constructs' variables. All factor loadings estimates, as shown in Appendix I.4, were above .5. All of the C.R.  $> 1.96$  (loadings ranged from 5.899 to 10.105 ( $p < .001$ )), providing support for the constructs' convergent validity. Composite reliability (CR) should exceed the recommended level of .7, and average variance extracted (AVE) should be greater than the generally acceptable cut-off point of .5. CR and AVE were calculated for each variable using Fornell and Larcker's (1981) formulas. As Table 9.5 displays, all composite reliabilities CR were above the recommended level of .7, ranging between .761 and .819, confirming the convergent validity, while the AVE estimates ranged from .512 to .605, exceeding the .5 cut-off and providing additional support for the constructs' convergent validity. Therefore, the data support the convergent validity of the antecedents' and moderator's model.

	CR	AVE	CONV	CLAR	FAMIL	ANTHR	CONTR
CONV	0.819	0.605	<b>0.778</b>				
CLAR	0.804	0.512	0.408	<b>0.715</b>			
FAMIL	0.761	0.515	0.136	0.195	<b>0.718</b>		
ANTHR	0.775	0.535	0.342	0.519	0.262	<b>0.732</b>	
CONTR	0.800	0.576	0.665	0.350	0.110	0.477	<b>0.759</b>

**Table 9. 5 Average variance extracted (AVE), composite reliabilities (CR), construct correlations, and square root of AVE on the diagonal (antecedent and moderator constructs)**

**Discriminant validity:** After assessing the convergent validity and composite reliability of the constructs, discriminant validity was assessed. Table 9.5 shows that all square root of AVE estimates, on the diagonal, were greater than the one absolute value of the correlations with another factor. This provided evidence of discriminant validity for all these constructs.

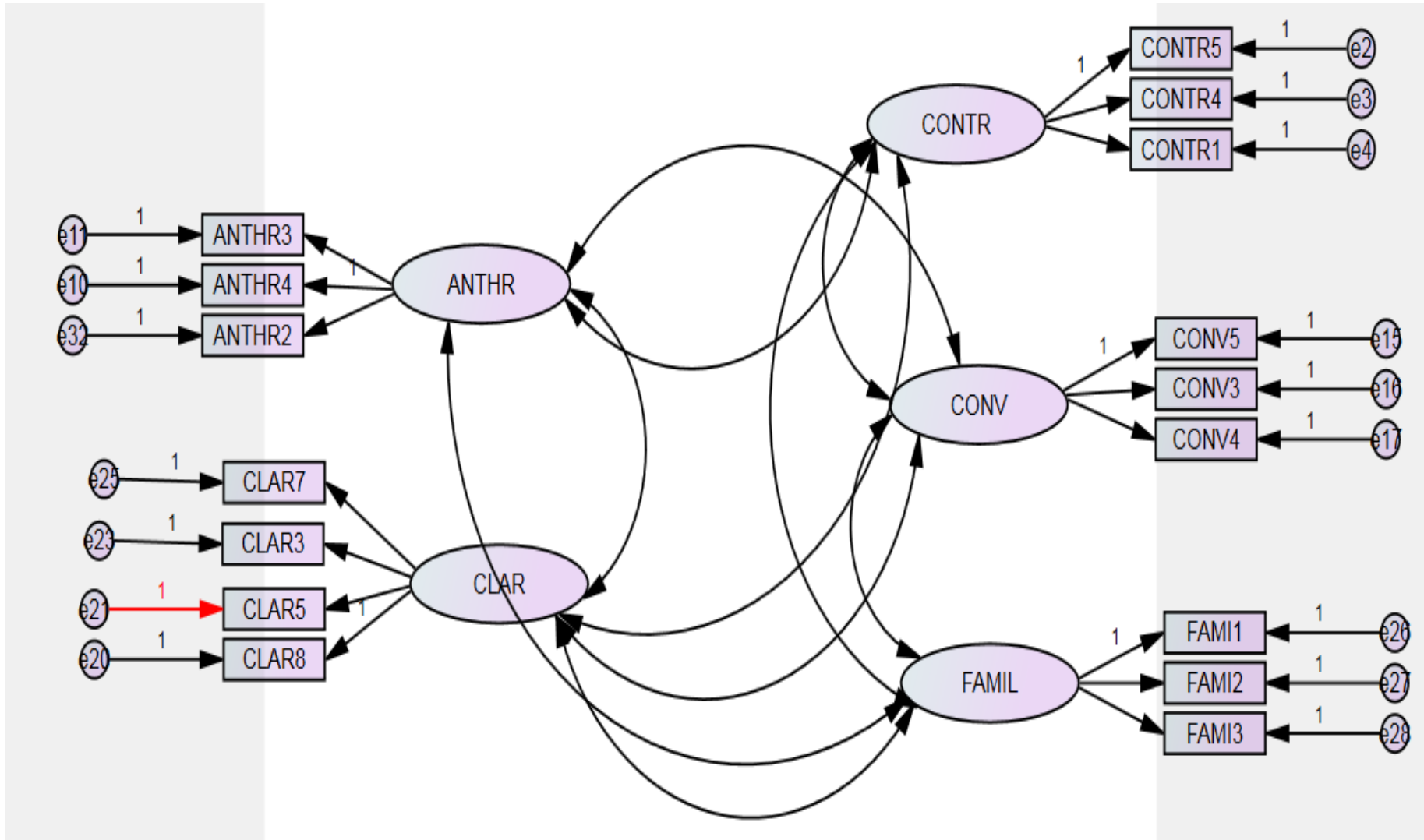


Figure 9. 3 Antecedents and moderator model (Confirmatory factor analysis)

#### 9.4.2 Output of model two: consequences related to the website

A 39-item, six-factor model was estimated. Assessment of model fit revealed that the  $\chi^2$  (761) = 1517.061,  $p = .000$ , GFI = .649, CFI = .779, TLI = .762 and RMSEA = .086, indicating the model was not fit. An inspection of the MIs revealed that 20 items were candidates for removal. This iterative process ended with a 19-item six-factor model. Model fit was improved as shown in Table 9.4:  $\chi^2$  (134) = 168.537,  $p > .001$ , GFI = .883, CFI = .975, TLI = .968, RMSEA = .044). The number of degrees of freedom satisfied the assumed criterion ( $1.258 < 2$ ), which indicates that the quality of the model is good. The improved (19-item) confirmatory factor model included attitude towards the website as a second-order construct consisting of three first-order constructs (three attractiveness items, two likeability items, two novelty items), three recall information items, three hedonic characteristic items, two usefulness items, two social presence items and two ease of use items. The standardised and unstandardised item-loading estimates on their hypothesised dimensions are shown in Appendix I.5. The standardised item-loading estimates ranged from .613 to .928 with  $\chi^2$  values ranging from 4.004 to 17.159 ( $p < 0.001$ ), indicating highly significant item loadings.

**Convergent validity and composite reliability:** Again, four criteria were used in evaluating the convergent validity of constructs' variables. All factor loadings estimates (Appendix I.5) were above .5. All C.R.  $> 1.96$  (loadings ranged from 4.004 to 17.159 ( $p < .001$ )), providing support for the constructs' convergent validity. CR and AVE were calculated for each variable. As Table 9.6 shows, all CR were above the recommended level of .7, ranging between .780 and .936, confirming the convergent validity, and AVE estimates ranged from .639 to .831, exceeding the .5 cut-off and providing additional support for the constructs' convergent validity. Therefore, the data support the convergent validity of the antecedents' and moderator's model.

**Discriminant validity:** Table 9.6 shows that all square root of AVE estimates, on the diagonal, were greater than the one absolute value of the correlations with another factor. This provided evidence of discriminant validity for all these constructs.

	CR	AVE	SP	HED	USEF	REC	ATTW	EOUW
SP	0.818	0.691	<b>0.832</b>					
HED	0.936	0.831	0.506	<b>0.911</b>				
USEF	0.780	0.639	0.351	0.527	<b>0.800</b>			
REC	0.879	0.708	0.295	0.472	0.611	<b>0.841</b>		
ATTW	0.870	0.697	0.418	0.702	0.764	0.658	<b>0.835</b>	
EOUW	0.802	0.672	0.151	0.479	0.378	0.229	0.383	<b>0.820</b>

**Table 9. 6 AVE, CR, construct correlations, and square root of AVE on the diagonal (consequences related to the website)**

#### **9.4.3 Output of model three: consequences related to the brand**

A 31-item, four-factor model was estimated. Assessment of model fit revealed that the  $\chi^2$  (425) = 976.026,  $p = .000$ , GFI = .680, CFI = .828, TLI = .811 and RMSEA = .098, indicating the model was not fit. Seventeen items were candidates for removal. This iterative process ended with a 14-item, four-factor model. Model fit was improved as shown in Table 9.4:  $\chi^2$  (68) = 82.760,  $p > .05$ , GFI = .923, CFI = .986, TLI = .981 and RMSEA = .040. The number of degrees of freedom satisfied the assumed criterion ( $1.217 < 2$ ), which indicates that the quality of the model is good. The improved (14-item) confirmatory factor model included attitude towards the brand as a second-order construct consisting of three first-order constructs (two modernity items, three image items and two recall brand items), two word of mouth items, two recommendation items and three feedback items. As shown in Appendix I.6, the standardised item-loading estimates ranged from .530 to .927, with  $\chi^2$  values ranging from 4.454 to 13.973 ( $p < 0.001$ ), indicating highly significant item loadings.

**Convergent validity and composite reliability:** Based on the four criteria used in evaluating the convergent validity of constructs' variables, the factor loadings estimates, as shown in Appendix I.6, were above .5. All C.R. values were  $> 1.96$  (loadings ranged from 4.454 to 13.973 ( $p < .001$ )), providing support for the constructs' convergent validity. In

addition, Table 9.7 shows that all CR were above the recommended level of .7, ranging between .778 and .932, confirming the convergent validity, and AVE estimates ranged from .540 to .830, exceeding the .5 cut-off and providing additional support for the constructs' convergent validity. Therefore, the data support the convergent validity of the antecedents' and moderator's model.

**Discriminant validity:** Table 9.7 shows that all square root of AVE estimates, on the diagonal, were greater than the one absolute value of the correlations with another factor. This provided evidence of discriminant validity for all these constructs.

	CR	AVE	WOM	ATTU	GFB	RECOM
WOM	0.907	0.830	<b>0.911</b>			
ATTU	0.932	0.821	0.812	<b>0.906</b>		
GFB	0.778	0.540	0.429	0.400	<b>0.735</b>	
RECOM	0.818	0.694	0.735	0.766	0.370	<b>0.833</b>

**Table 9. 7 AVE, CR, construct correlations, and square root of AVE on the diagonal (consequences related to the brand)**

## 9.5 Common method bias

This section deals with the statistical remedies to assess the severity of common method bias. As mentioned in Chapter Five, the technique adopted for the current study was the comprehensive CFA marker technique (Williams et al., 2010). This technique was used on three models: antecedents and moderator, the consequences related to the website and the consequences related to the brand.

### 9.5.1 Common method bias: the antecedents and moderator

In line with Williams et al.'s (2010) suggestions, a four-item perfectionism construct was selected as the marker variable as no theoretical linkages between this marker variable and the five antecedent and moderator constructs have been reported in the literature. After selecting the marker variable, four nested CFA models were assessed to test for the presence and equality of method variance associated with the marker variable: the CFA model, the



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baseline model, method C model and method R model. In the CFA model, all variables (including the marker variable) were allowed to correlate.

The CFA model permits for a complete set of correlations among the five substantive latent variables (control, clarity, anthropomorphism, familiarity and convenience) and the marker latent variable (perfectionism). The main objective of assessing this model was to obtain the factor loading and measurement error variance estimates for the four marker variable indicators for use in following models.

The baseline model was the second model evaluated, which allows the five substantive factors to be correlated with each other. However, there was an orthogonal marker latent variable, with the substantive factors indicators having fixed factor loadings and fixed error variances. The unstandardised factor loadings from the CFA model were used as fixed values for the four indicators: .62, 1.05, 1.39 and 1.14, respectively. The unstandardised error variances were 1.82, 1.13, .45 and 1.24. The use of these fixed values was necessary to establish the meaning of the marker latent variable because, in all following models, the marker latent variable was linked to the substantive indicators through secondary factor loadings (Williams et al., 2010). The assumption that the marker latent variable was orthogonal with the baseline model was to have it specified so that all subsequent model comparisons would focus only on method variance factor loadings (Williams et al., 2010).

In addition, the method C model was assessed. This model is similar to the baseline model in two ways: the method marker variable was assumed to have orthogonality of the method marker variable and the fixed values of measurement parameters are associated with its indicators. However, the main difference in the method C model was the added factor loadings from the method marker variable latent to each of the 16 indicators in the model. Each of the marker method factor loadings related to the substantive items was forced to be equal in value to others to reflect the assumption of the CMV model of equal method effects.

The comparison of the method C model with the baseline model provides a test of the presence of equal method variance effects associated with the marker variable (Williams et al., 2010). Finally, in the method R model, the obtained factor correlations for control, clarity, anthropomorphism, familiarity and convenience from the baseline model were used as fixed values in the method C. The comparison of the method C model with the method R model offered a statistical test of the biasing effects of the marker variable on substantive relations.

The model fit results of the analyses for each model are shown in Table 8.8. It includes the chi-square, degrees of freedom, CFI values and chi-square comparison tests. Based on the results, the baseline model showed fit: CFI = .953 and  $X^2 = 209.143$ , with 164 degrees of freedom. The baseline model and method C model were compared to test the null hypothesis, that the method factor loadings associated with the marker variable were not related to each of the 16 substantive indicators. The comparison of the two models did not provide support that method variance was present because there was no significant difference between the models. Specifically, as shown in Table 9.8, the comparison revealed a chi-square difference of .261, with one degree of freedom, which does not exceed the 0.05 chi-square critical value for one degree of freedom of 3.84. Therefore, it indicated that the factor loadings were not significantly biased by common method variance.

Model	$X^2$	df	p	CFI
<b>CFA</b>	201.914	155	.007	.951
<b>Baseline</b>	209.143	164	.010	.953
<b>C</b>	208.882	163	.009	.952
<b>R</b>	208.896	173	.032	.992
$\Delta$ Models	$\Delta X^2$	$\Delta$ df	<b>P</b>	
<b>Baseline vs. Method-C</b>	.261	1	0.609	
<b>Method-C vs. Method- R</b>	.014	10	1.00	

**Table 9. 8 Common method bias: goodness of fit values and model comparison tests (antecedents and moderator)**

The second comparison was between the method C and method R models to further examine whether the correlation parameter estimates were significantly biased by marker variable

method effects or not. The chi-square difference test resulted in no significant difference between the models (see Table 9.8), indicating no significant bias the correlation estimates occurring from the marker variable. This means that no significant difference existed between the baseline model factor correlations and method C model factor correlations as shown in Table 9.9.

			Estimate	
			Baseline	Method-C
<b>Convenience</b>	<-->	Clarity	.408	.405
<b>Control</b>	<-->	Clarity	.350	.346
<b>Anthropomorphism</b>	<-->	Clarity	.519	.518
<b>Control</b>	<-->	Anthropomorphism	.477	.473
<b>Anthropomorphism</b>	<-->	Convenience	.342	.338
<b>Control</b>	<-->	Convenience	.665	.662
<b>Control</b>	<-->	Familiarity	.110	.110
<b>Convenience</b>	<-->	Familiarity	.136	.137
<b>Anthropomorphism</b>	<-->	Familiarity	.262	.264
<b>Clarity</b>	<-->	Familiarity	.195	.200

**Table 9. 9 Common method bias: baseline model and method-C model factor correlations (antecedents and moderator)**

### 9.5.2 Common method bias: consequences related to the website

As with the antecedent and moderator constructs, the four nested CFA models were assessed to test for the presence and equality of method variance associated with the marker variable. In the CFA model, all variables (including the marker variable) were allowed to correlate. The CFA model allows for a complete set of correlations among the five substantive latent variables (recall information, hedonic characteristics, usefulness, attitude towards the website, social presence and ease of using the website) and the marker latent variable (perfectionism).

The baseline model was the second model evaluated, which allowed the six substantive factors to be correlated with each other. However, there was an orthogonal marker latent variable, with the substantive factors indicators having fixed factor loadings and fixed error variances. The unstandardised factor loadings from the CFA model were used as fixed

values for the four indicators: .65, 1.07, 1.35 and 1.14, respectively. The unstandardised error variances were 1.78, 1.07, .55 and 1.22.

In addition, the method C model was assessed. This model is similar to the baseline model, as mentioned before, but the main difference in the method C model was the added factor loadings from the method marker variable latent to each of the 19 indicators in the model. Each of the marker method factor loadings related to the substantive items was forced to be equal in value to others to reflect the assumption of the CMV model of equal method effects. Finally, in the method R model, the obtained factor correlations for recall information, hedonic characteristics, usefulness, attitude towards the website, social presence and ease of using the website from the baseline model were used as fixed values in the method C.

The model fit results of the analyses for each model are shown in Table 9.10, including the chi-square, degrees of freedom, CFI values and chi-square comparison tests. Based on the results, the baseline model showed fit: CFI = .960 and  $X^2 = 277.912$ , with 216 degrees of freedom.

The baseline model and method C model were compared to test the null hypothesis that the method factor loadings associated with the marker variable were not related to each of the 19 substantive indicators. The comparison of the two models did not provide support that method variance was present as there was no a significant difference between the models. Specifically, as shown in Table 9.10, the comparison revealed a chi-square difference of 1.389, with one degree of freedom, which does not exceed the 0.05 chi-square critical value for one degree of freedom of 3.84. Therefore, it indicated that the factor loadings were not significantly biased by common method variance.

Model	$X^2$	df	p	CFI
<b>CFA</b>	266.344	206	.003	.961
<b>Baseline</b>	277.912	216	.003	.960
<b>C</b>	276.523	215	.003	.960
<b>R</b>	276.568	230	.019	.970

$\Delta$ Models	$\Delta X^2$	$\Delta$ df	P
<b>Baseline vs. Method-C</b>	1.389	1	0.239
<b>Method-C vs. Method- R</b>	.045	15	1.00

**Table 9. 10 Common method bias: goodness of fit values and model comparison tests (consequences related to the website)**

The second comparison was between the method C and method R models to further examine whether the correlation parameter estimates were significantly biased by marker variable method effects or not. The chi-square difference test resulted in a non-significant difference between both models (see Table 9.10), indicating no significant bias in the correlation estimates due to the marker variable. The differences between the baseline model factor correlations and method C model factor correlations were very small, as shown in Table 9.11.

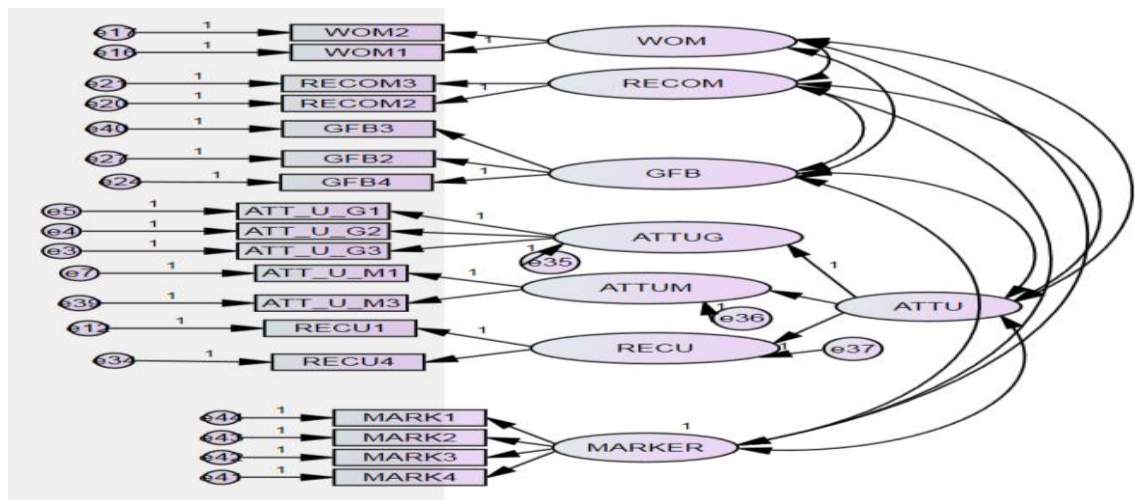
			Estimate	
			Baseline	Method-C
Hedonic	<-->	Usefulness	.527	.526
Ease of use web	<-->	Usefulness	.378	.381
Usefulness	<-->	Recall information	.611	.605
Social presence	<-->	Usefulness	.351	.356
Usefulness	<-->	Attitude toward web	.764	.757
Hedonic	<-->	Ease of use web	.479	.481
Hedonic	<-->	Recall information	.472	.469
Hedonic	<-->	Social presence	.506	.508
Hedonic	<-->	Attitude toward web	.702	.703
Ease of use web	<-->	Recall information	.229	.229
Social presence	<-->	Ease of use web	.151	.161
Ease of use web	<-->	Attitude toward web	.383	.384
Social presence	<-->	Recall information	.295	.296
Recall information	<-->	Attitude toward web	.658	.651
Social presence	<-->	Attitude toward web	.418	.421

**Table 9. 11 Common method bias: baseline model and method-C model factor correlations (consequences related to the website)**

### 9.5.3 Common method bias: consequences related to the brand

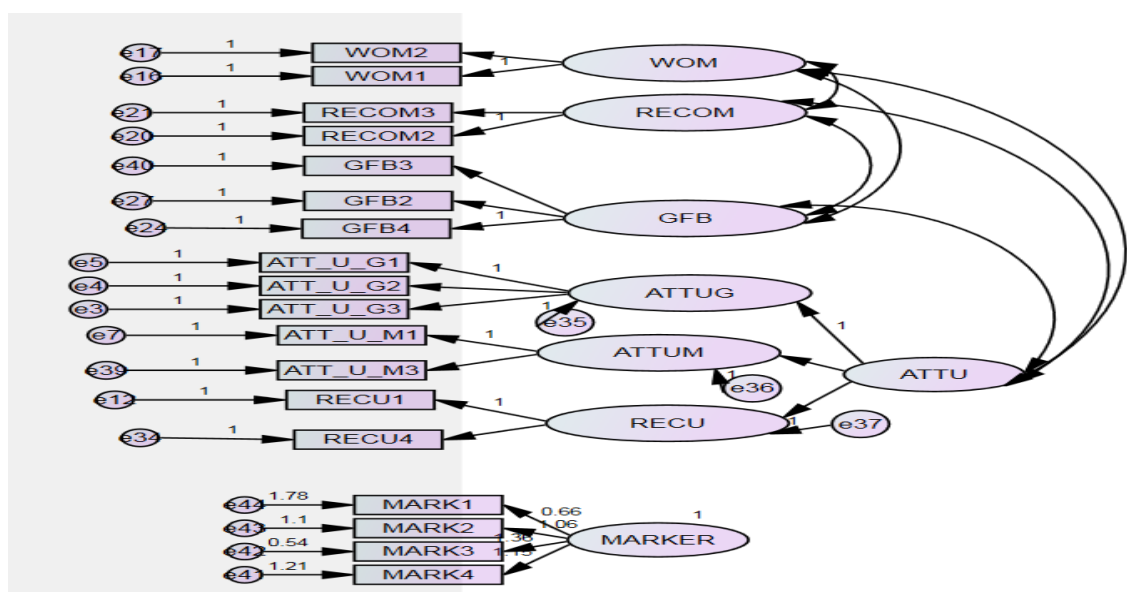
Again, the five nested CFA models were assessed to test for the presence and equality of method variance associated with the marker variable. In the CFA model, all variables (including the marker variable) were allowed to correlate, as shown in Figure 9.4. The CFA model allowed for a complete set of correlations among the four substantive latent variables (attitude towards the

website, recommendation, word of mouth and feedback) and the marker latent variable (perfectionism).



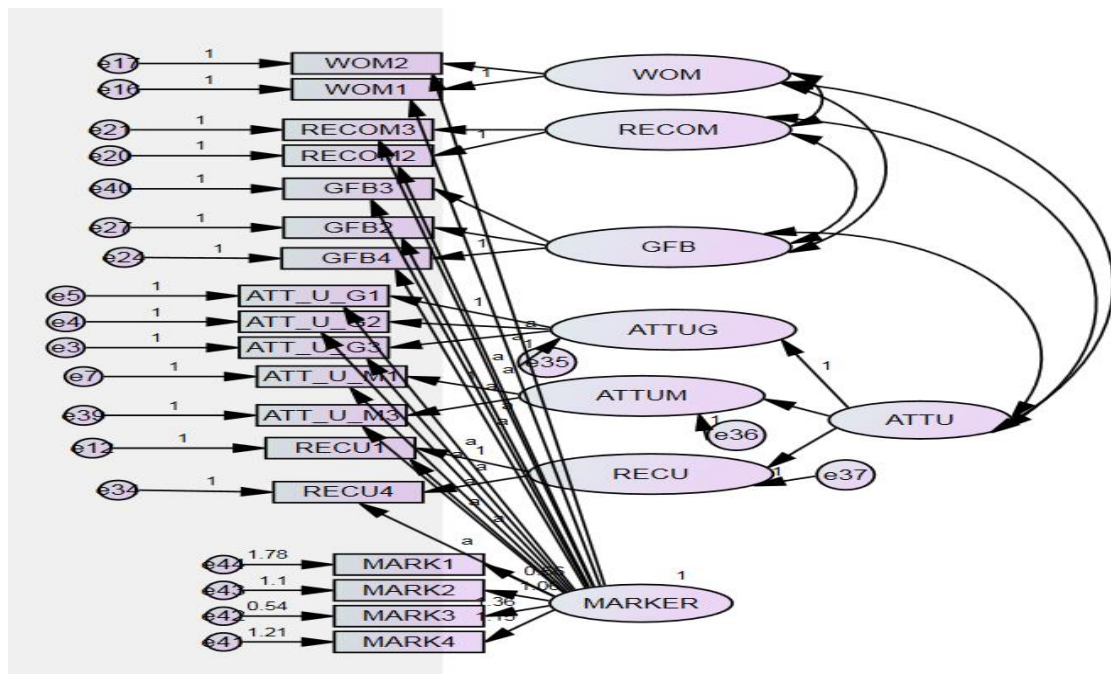
**Figure 9. 4 Common method bias: CFA model (consequences related to the brand)**

The baseline model was the second model evaluated, as shown in Figure 9.5, and allowed the four substantive factors to be correlated with each other. However, there was an orthogonal marker latent variable, with the substantive factors indicators having fixed factor loadings and fixed error variances. The unstandardised factor loadings from the CFA model were used as fixed values for the four indicators: .66, 1.06, 1.36 and 1.15, respectively. The unstandardised error variances were 1.78, 1.10, .54 and 1.21.



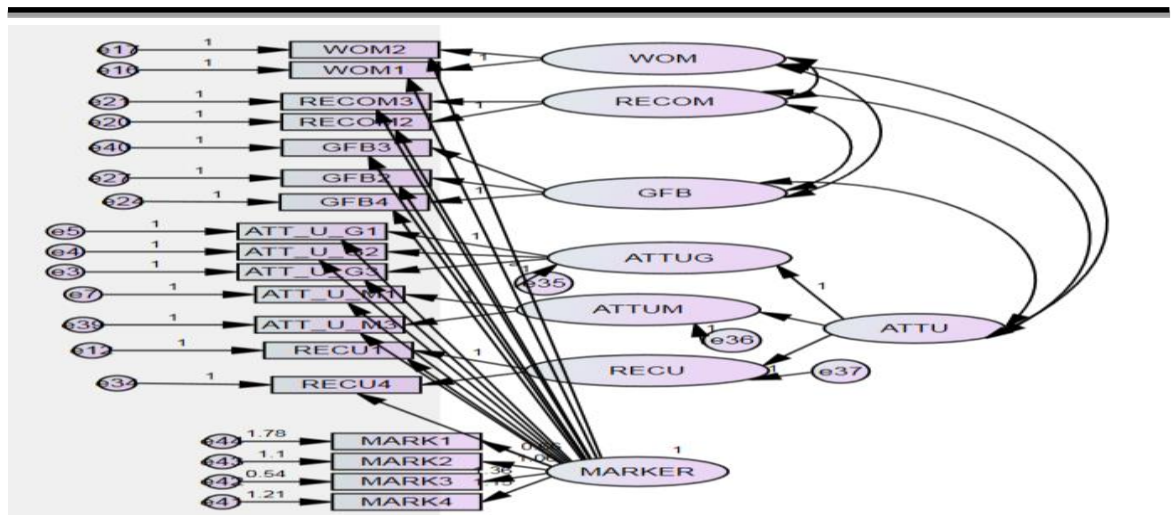
**Figure 9. 5 Common method bias: baseline model (consequences related to the brand)**

In addition, the method C model was assessed as shown in Figure 9.6. This model is similar to the baseline model, as mentioned before, but the method -C model, included the added factor loadings (forced to be equivalent values) from the method marker variable latent to each of the 14 indicators in the model. The method U model was also assessed, as shown in Figure 9.7. This model is similar to the method C model, but the added factor loadings are not forced to be equivalent values from the method marker variable latent to each of the 14 indicators in the model. It was allowed to have different estimates, indicating that the marker variables were differently related to substantive variables (the 14 indicators).



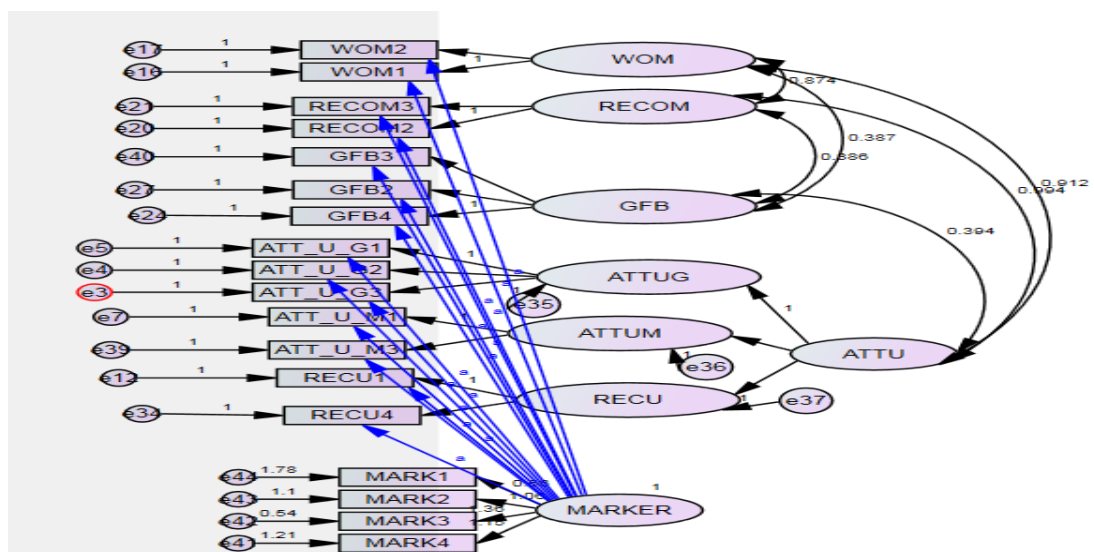
**Figure 9. 6 Common method bias: method-C model (the consequences related to the brand)**

In the method R model, the obtained factor correlations for attitude towards the website, giving feedback, recommendation and word of mouth from the baseline model were used as fixed values in the method C or method U model, whichever was better (method C was better in this study), as shown in Figure 9.8.



**Figure 9. 7 Common method bias: method-U model (consequences related to the brand)**

The model fit results of the analyses for each model are shown in Table 9.12, which includes the chi-square, degrees of freedom, CFI values and chi-square comparison tests. Based on the results, the baseline model demonstrated fit: CFI = .942 and  $X^2 = 203.832$ , with 130 degrees of freedom.



**Figure 9. 8 Common method bias: method-R model (consequences related to the brand)**

The comparison between the baseline model and method C model based on  $X^2$  provided support that method variance was present as there was a significant difference between the models ( $p = 0.022$  or  $< .05$ ), as shown in Table 9.12. The comparison between method C and method U models showed no significant difference between the models ( $p = .180$ ),



indicating that the marker variable influences all factor loadings equally. Therefore, the method C model was considered the best model for calculating the marker variance on substantive indicators.

Model	X <sup>2</sup>	df	p	CFI
<b>CFA</b>	196.014	122	.000	.942
<b>Baseline</b>	203.832	130	.000	.942
<b>C</b>	198.569	129	.000	.945
<b>U</b>	181.131	116	.000	.949
<b>R</b>	198.701	135	.000	.950
<b>Δ Models</b>	<b>Δ X<sub>2</sub></b>	<b>Δ df</b>	<b>P</b>	
<b>Baseline vs. Method-C</b>	5.263	1	0.022	
<b>Method-C vs. Method-U</b>	17.438	13	0.180	
<b>Method-C vs. Method- R</b>	.132	6	1.00	

**Table 9. 12 Common method bias: goodness of fit values and model comparison tests (consequences related to the brand)**

Table 9.14 shows that the standardised factor loadings for method C model ranged from .493 to .938, and all substantive variables loaded significantly ( $p < 0.001$ ) on the constructs they are proposed to measure. In terms of the method factor loadings, values ranged from .113 to .166, and all items were statistically significant, with  $p = .022$ . This significance indicates that the items were contaminated by a source of method variance captured by the marker variable. The square of these values shows the percentage of variance in the indicator associated with the marker variable, indicating that the median value of marker variance in each indicator was 1.59%, which is very small compared to the percentage of variance (9.6%) determined by Williams et al. (2010). Therefore, it can be concluded that common method bias does not represent a serious concern at the indicator level. Finally, the comparison between the method C model and method-R model further examined whether the correlation parameter estimates were significantly biased by marker variable method effects. The chi-square difference test resulted in no significant difference between the models (see Table 9.12), indicating that there was no significant bias in the correlation estimates due to the marker variable. This means that there is no significant difference

between the baseline model factor correlations and method C model factor correlations, as shown in Table 9.13.

			Estimate	
			Baseline	Method-C
<b>Word of mouth</b>	<-->	Attitude toward brand	.812	.806
<b>Recommendation</b>	<-->	Attitude toward brand	.766	.757
<b>Giving feedback</b>	<-->	Attitude toward brand	.400	.372
<b>Word of mouth</b>	<-->	Recommendation	.735	.727
<b>Recommendation</b>	<-->	Giving feedback	.370	.343
<b>Word of mouth</b>	<-->	Giving feedback	.429	.405

**Table 9. 13 Common method bias: baseline model and method-U model factor correlations (consequences related to the brand)**

## 9.6 Test of propositions

### 9.6.1 Factorial design ANOVA (two-way independent ANOVA)

*P1: The degree of anthropomorphism, clarity, control, familiarity and convenience is significantly affected by the condition (admin-avatar and admin-avatar based on text) and the language used (English and user's own language).*

The first proposition of this study stated that the degree of anthropomorphism, clarity, control, familiarity and convenience differed based on the condition (admin-avatar and admin-avatar based on text) and language (English and user's own language). Table 9.15 shows a summary of important factorial ANOVA output. As shown in Table 9.15, there was a significant main effect of the admin-avatar condition on the anthropomorphism of admin-avatar,  $F(1, 131) = 2.815, p < .1$ . The mean test revealed that anthropomorphism was significantly lower with the admin-avatar (whether in English or the user's own language) than the admin-avatar based on text. However, there was no significant main effect of the admin-avatar condition on the other constructs (clarity, control, convenience and familiarity). In addition, there was a significant main effect of the admin-avatar language on the familiarity of the admin-avatar,  $F(1, 131) = 7.349, p < .05$ .

The mean test revealed that the participants' familiarity with admin-avatar/admin-avatar based on text in their own language was significantly lower than admin-avatar/admin-avatar based on text in the English language as a second/formal language to them. However, there

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was a non-significant main effect of the language used on the other constructs (clarity, control, convenience and anthropomorphism). There was a significant interaction effect between the admin-avatar condition and the admin-avatar language on the convenience construct:  $F(1, 131) = 5.122, p < .05$ . This indicates that the admin-avatar conditions (admin-avatar and admin-avatar based on text) were affected differently by the language used. Specifically, the convenience was higher in the admin-avatar based on text condition ( $M = 5.4674$ ) than the admin-avatar ( $M = 4.8248$ ) when English was used as a second language. In contrast, the convenience was significantly higher in the admin-avatar ( $M = 5.2577$ ) than the admin-avatar based on text condition ( $M = 4.9823$ ) when the language used was the participant's own language.

Figure 9.9 shows the significant effect of condition on the anthropomorphism construct. Anthropomorphism was significantly lower with admin-avatar (whether English or the user's own language) than admin-avatar based on text. The second top right graph shows the significant effect of language on familiarity construct. The participants' familiarity with the admin-avatar/admin-avatar based on text in their own language was significantly lower than in English language as a second/formal language to them. The last graph shows the significant interaction between the admin-avatar condition and the language used regarding the convenience construct. The blue line indicates that convenience was higher in the admin-avatar condition when using one's own language compared to using English as a second language. In contrast, the green line indicates that the convenience of using the admin-avatar based on text was higher when English was a second language of the participant but lower when the language used was the participant's own language.

Indicator	ATTU	ATTU (Image)	ATTU (Modernity)	Recall brand	Word of mouth	Recommendation	Giving feedback	Marker variable
<b>ATT_U_G</b>	.925**							-----
<b>ATT_U_M</b>	.860**							-----
<b>RECU</b>	.938**							-----
<b>ATT_U_G3</b>		.893**						.127*
<b>ATT_U_G2</b>		.792**						.121*
<b>ATT_U_G1</b>		.842**						.122*
<b>ATT_U_M1</b>			.903**					.135*
<b>ATT_U_M3</b>			.814**					.133*
<b>RECU1</b>				.519**				.166*
<b>RECU4</b>				.493**				.118*
<b>WOM1</b>					.892**			.151*
<b>WOM2</b>					.906**			.139*
<b>RECOM2</b>						.763**		.113*
<b>RECOM3</b>						.880**		.119*
<b>GFB2</b>							.776**	.125*
<b>GFB3</b>							.747**	.130*
<b>GFB4</b>							.632**	.121*
<b>MARKER1</b>								.443
<b>MARKER2</b>								.712
<b>MARKER3</b>								.882
<b>MARKER4</b>								.722

\*\*p<0.001, \*p<0.05

**Table 9. 14 Common method bias: method-C model standardised factor loadings (consequences related to the brand)**

	Mean				Sphericity	Source	Effects	
	AA×E*	ABT×E**	AA×O***	ABT×O****			F	Sig
<b>Anthropomorphism</b>	3.6601	4.1419	3.8988	4.0515	.902	Condition	2.815	.096 <sup>c</sup>
						Language	.154	.696
						Interaction	.757	.386
<b>Clarity</b>	4.6079	4.6457	4.7352	4.8516	.745	Condition	.245	.621
						Language	1.145	.287
						Interaction	.064	.801
<b>Control</b>	4.4939	5.0094	4.9402	4.8504	.082	Condition	.829	.364
						Language	.378	.540
						Interaction	1.676	.198
<b>Convenience</b>	4.8248	5.4674	5.2577	4.9823	.021	Condition	.820	.367
						Language	.017	.898
						Interaction	5.122	.025 <sup>b</sup>
<b>Familiarity</b>	3.3553	3.5419	2.7516	2.9990	.309	Condition	1.053	.307
						Language	7.349	.008 <sup>b</sup>
						Interaction	.021	.886

AA×E\*: Admin-avatar in English language, ABT×E\*\*: Admin-avatar based on text in English language, AA×O\*\*\*: Admin-avatar in Own language (Arabic and Chinese) and ABT×O\*\*\*\*: Admin-avatar based on text in Own language (Arabic and Chinese).

a: significant at .001, b: significant at .05 and c: significant at .1

**Table 9. 15 Summary of factorial ANOVA output (antecedents and moderator)**

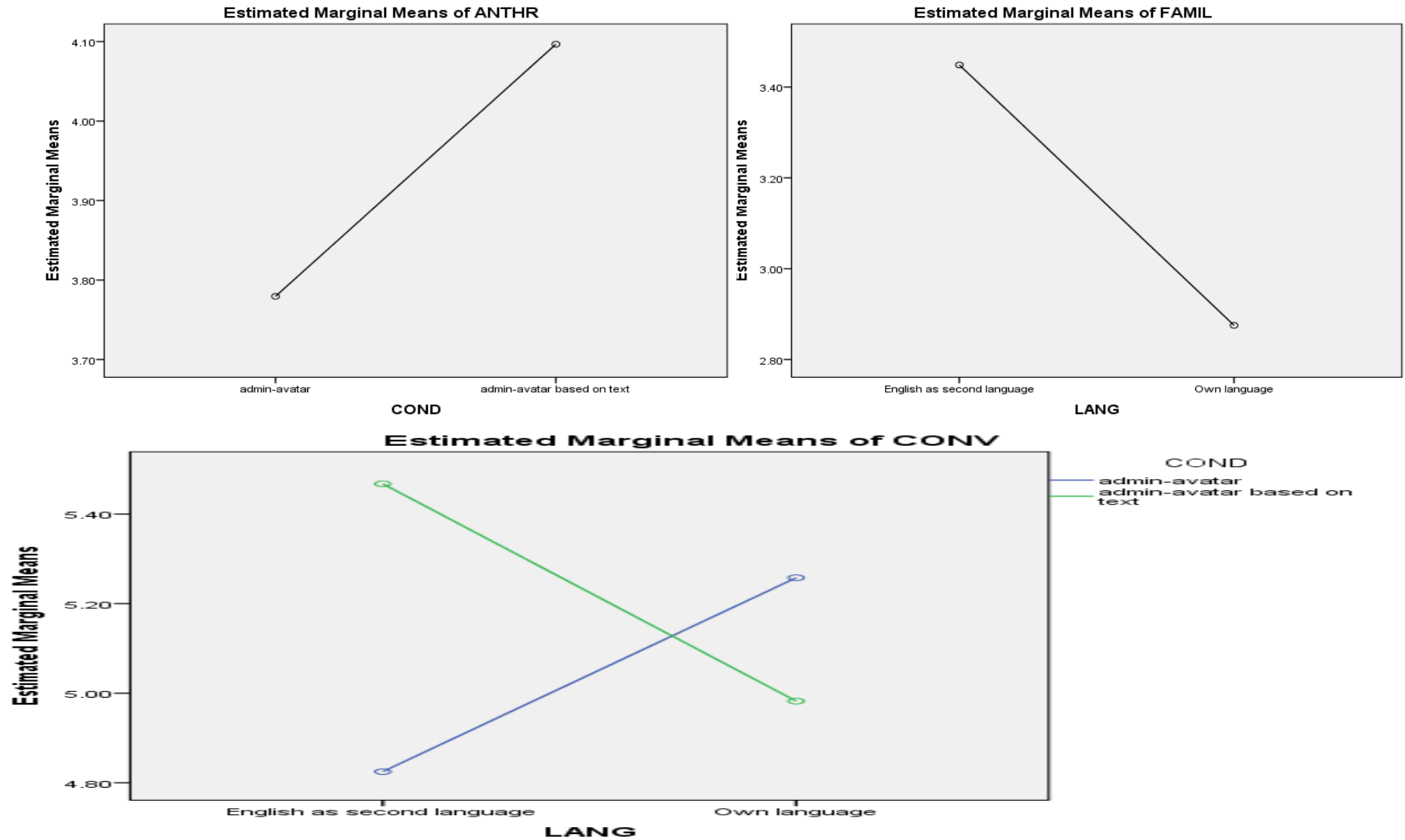


Figure 9. 9 Significant effect of condition (anthropomorphism), language (familiarity) and interaction (convenience)

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*P2: The students' perceptions of the consequences related to the website (hedonic characteristics, usefulness, social presence, recall information, ease of using the website and attitude towards the website) are significantly affected by the admin-avatar condition and the language used (English vs. students' own language).*

The second proposition of this study stated that the students' perceptions regarding the consequences related to the website differed based on the admin-avatar condition (admin-avatar and admin-avatar based on text) and the language used (English and participants' own language). Table 9.16 shows a summary of important factorial ANOVA output. As shown in Table 9.16, there was a significant main effect of the admin-avatar condition on the recall information:  $F(1, 131) = 2.875, p < .1$ . The mean test revealed that the recall information was significantly lower with the admin-avatar (whether English or user's own language) than the admin-avatar based on text. In addition, there was a significant main effect of the admin-avatar condition on the attitude towards the website, particularly the likeability construct:  $F(1, 131) = 3.195, p < .1$  —  $F(1, 131) = 3.811, p < .1$ . The mean test revealed that the attitude towards the website was significantly higher with the admin-avatar based on text (regardless of language) than the admin-avatar. However, there was no significant main effect of the admin-avatar condition on the other constructs (hedonic characteristics, social presence, ease of using the website, usefulness, novelty and attractiveness). In addition, there was a significant main effect of the language used on the ease of using the website:  $F(1, 131) = 4.747, p < .05$ . The mean test revealed that the ease of using the website in the admin-avatar/admin-avatar based on text in participants' own language was significantly higher than in English language as a second/formal language for participants. However, there was a non-significant main effect of the language used on the remaining constructs related to the website. No significant interaction effect occurred between the admin-avatar condition and the language used on the constructs related to the website.

	Mean				Sphericity	Source	Effects	
	AA×E*	ABT×E**	AA×O***	ABT×O****			F	Sig
<b>Hedonic</b>	4.4660	5.2810	5.1283	5.0318	.588	Condition	1.603	.208
						Language	.530	.468
						Interaction	2.581	.111
<b>Social presence</b>	3.1273	3.4302	3.2062	3.4706	.733	Condition	1.349	.248
						Language	.060	.807
						Interaction	.006	.937
<b>Recall information</b>	5.0395	5.7611	5.2976	5.3409	.997	Condition	2.875	.092 <sup>c</sup>
						Language	.129	.720
						Interaction	2.260	.135
<b>Ease of use website</b>	3.7364	3.9781	4.1267	4.3480		Condition	1.762	.187
						Language	4.747	.031 <sup>b</sup>
						Interaction	.003	.953
<b>Usefulness</b>	5.1647	5.4281	5.2738	5.4511	.284	Condition	1.626	.204
						Language	.146	.703
						Interaction	.062	.804
<b>Attitude toward website</b>	2.5308	2.8552	2.7110	2.7497	.507	Condition	3.811	.053 <sup>c</sup>
						Language	.161	.689
						Interaction	2.358	.127
<b>Attractiveness</b>	4.5644	4.3047	4.5355	4.3727	.019	Condition	1.797	.182
						Language	.015	.901
						Interaction	.094	.759
<b>Likeability</b>	5.1936	4.6495	4.8680	4.7755	.014	Condition	3.195	.076 <sup>c</sup>
						Language	.314	.576
						Interaction	1.608	.207
<b>Novelty</b>	3.6151	3.6290	3.7678	3.5502	.359	Condition	.636	.427
						Language	.084	.773
						Interaction	.822	.366

AA×E\*: Admin-avatar in English language, ABT×E\*\*: Admin-avatar based on text in English language, AA×O\*\*\*: Admin-avatar in Own language (Arabic and Chinese) and ABT×O\*\*\*\*: Admin-avatar based on text in Own language (Arabic and Chinese). a: significant at .001, b: significant at .05 and c: significant at .1

**Table 9. 16 Summary of factorial ANOVA output (consequences related to the website)**



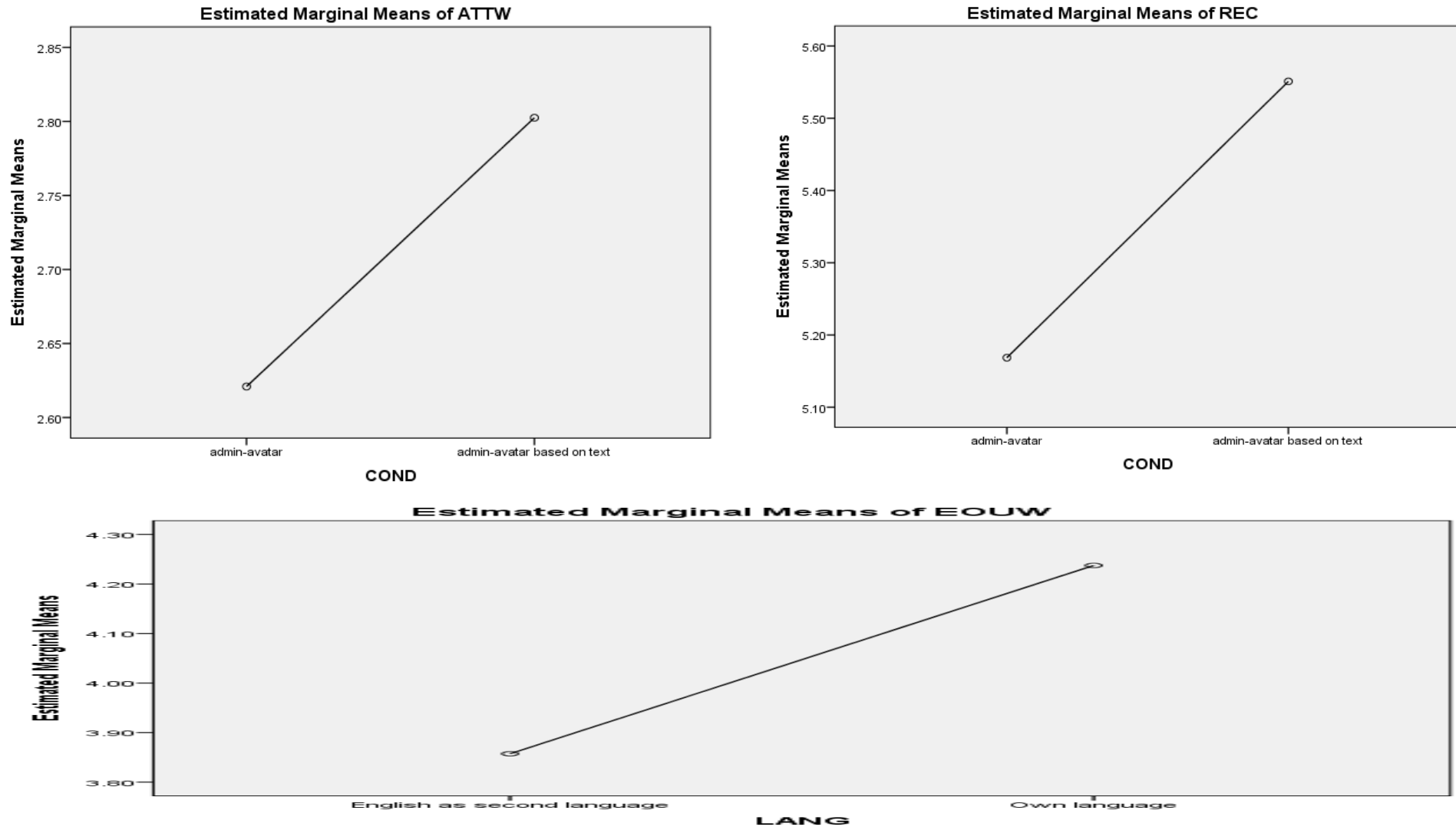


Figure 9. 10 Significant effect of condition (recall information, attitude toward website and likability) and a language (ease of use website)

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Figure 9.10 shows the significant effect of condition on the attitude towards the website construct, which was significantly lower with the admin-avatar (regardless of language) than the admin-avatar based on text. Similarly, the top right graph shows the significant effect of condition on the recall information construct; recall information was significantly lower with the admin-avatar (regardless of language) than the admin-avatar based on text. In addition, the third graph shows the significant effect of language on ease of using the website construct, which was significantly lower with the admin-avatar (regardless of language) than the admin-avatar based on text.

*P3: The students' perceptions of the consequences related to brand (attitude towards brand, recommendation, word of mouth and feedback) is significantly affected by the admin-avatar condition and the language used (English vs. students' own language).*

The third proposition of this study stated that the students' perceptions regarding the consequences related to the brand differed based on the admin-avatar condition (admin-avatar and admin-avatar based on text) and the language used (English and students' own language). As shown in Table 9.17, there was a significant main effect of the admin-avatar condition on the attitude towards brand construct (modernity and image scales) and recall brand construct:  $F(1, 131) = 5.177, 5.893$  and  $4.039$ , respectively,  $p < .05$ . The mean test revealed that these constructs were significantly higher in the admin-avatar (regardless of language) than the admin-avatar based on text. In addition, there was a significant main effect of the admin-avatar condition on the recommendation construct:  $F(1, 131) = 6.016$ ,  $p < .05$ . The mean test revealed that the recommendation was significantly higher with the admin-avatar based on text (regardless of language) than the admin-avatar. However, there was no significant main effect of the admin-avatar condition on the remaining constructs. Furthermore, there was no significant main effect of the language used on any consequences related to brand ( $p > .05$ ).

	Mean				Sphericity	Source	Effects	
	AA×E*	ABT×E**	AA×O***	ABT×O****			F	Sig
<b>Attitude toward brand</b>	5.1009	5.6048	5.3148	5.3199	.352	Condition	.032	.200
						Language	1.663	.858
						Interaction	1.596	.209
<b>Attitude toward brand (image)</b>	5.5070	5.0988	5.3015	4.7453	.003	Condition	5.177	.025 <sup>b</sup>
						Language	1.739	.190
						Interaction	.122	.727
<b>Attitude toward brand (modernity)</b>	5.7040	5.3040	5.6791	5.1040	.003	Condition	5.893	.017 <sup>b</sup>
						Language	.314	.576
						Interaction	.190	.663
<b>Recall brand</b>	2.7445	2.5932	2.6978	2.4880	.006	Condition	4.039	.047 <sup>b</sup>
						Language	.715	.399
						Interaction	.106	.745
<b>Word of mouth</b>	4.2156	4.8045	4.5722	4.5422	.026	Condition	2.323	.130
						Language	.066	.797
						Interaction	2.850	.094 <sup>c</sup>
<b>Recommendation</b>	3.8258	4.7962	4.4864	4.5068	.552	Condition	6.016	.015 <sup>b</sup>
						Language	.844	.360
						Interaction	5.532	.020 <sup>b</sup>
<b>Giving feedback</b>	3.6511	4.0538	4.0609	3.8489	.761	Condition	.407	.525
						Language	.470	.494
						Interaction	4.228	.042 <sup>b</sup>

AA×E\*: Admin-avatar in English language, ABT×E\*\*: Admin-avatar based on text in English language, AA×O\*\*\*: Admin-avatar in Own language (Arabic and Chinese) and ABT×O\*\*\*\*: Admin-avatar based on text in Own language (Arabic and Chinese). a: significant at .001, b: significant at .05 and c: significant at .1

**Table 9. 17 Summary of factorial ANOVA output (consequences related to the website)**

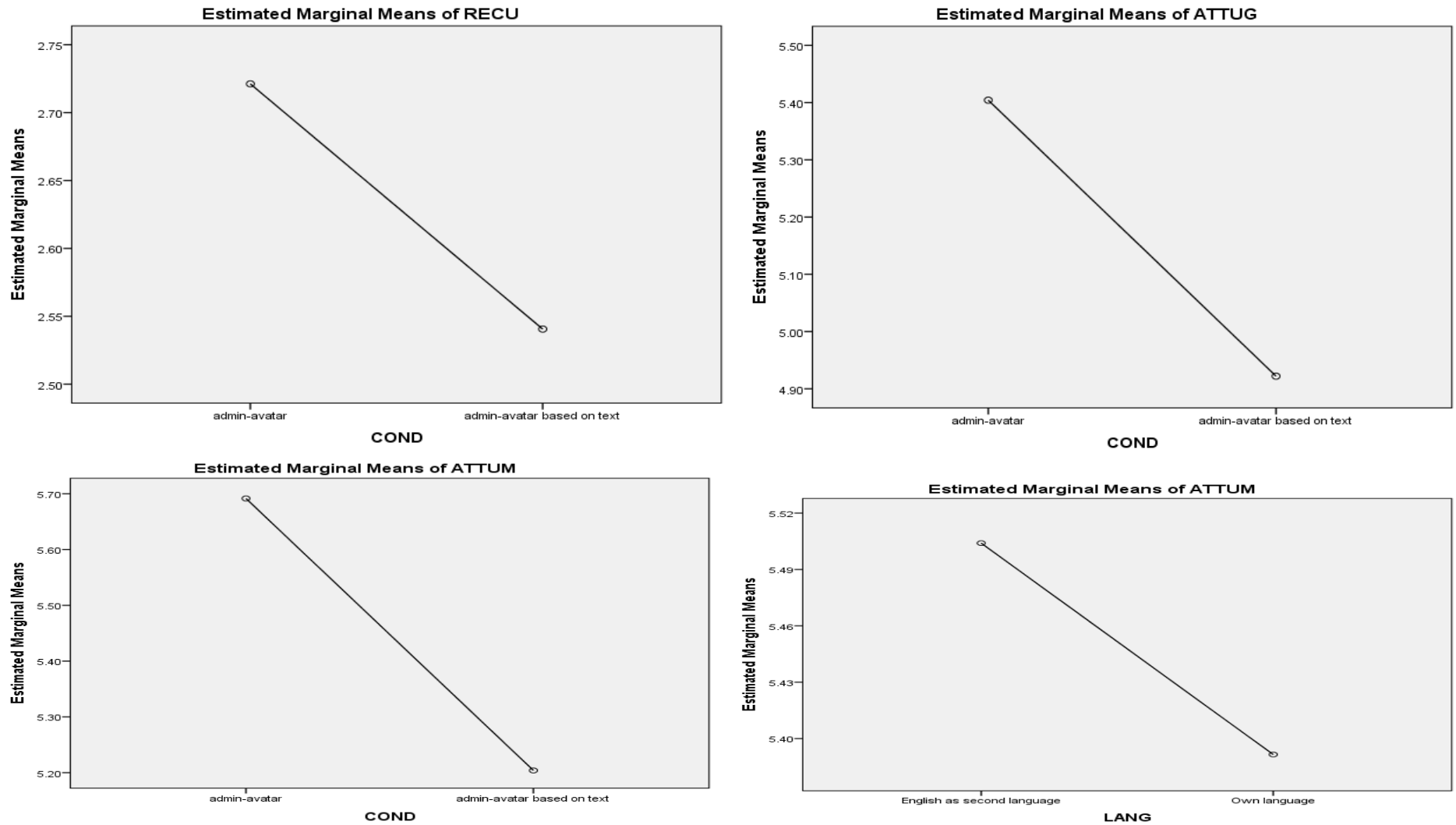


Figure 9. 11 Significant effect of condition (Recall brand, attitude toward brand (image) and attitude toward brand (modernity)) and a language (attitude toward brand (modernity))

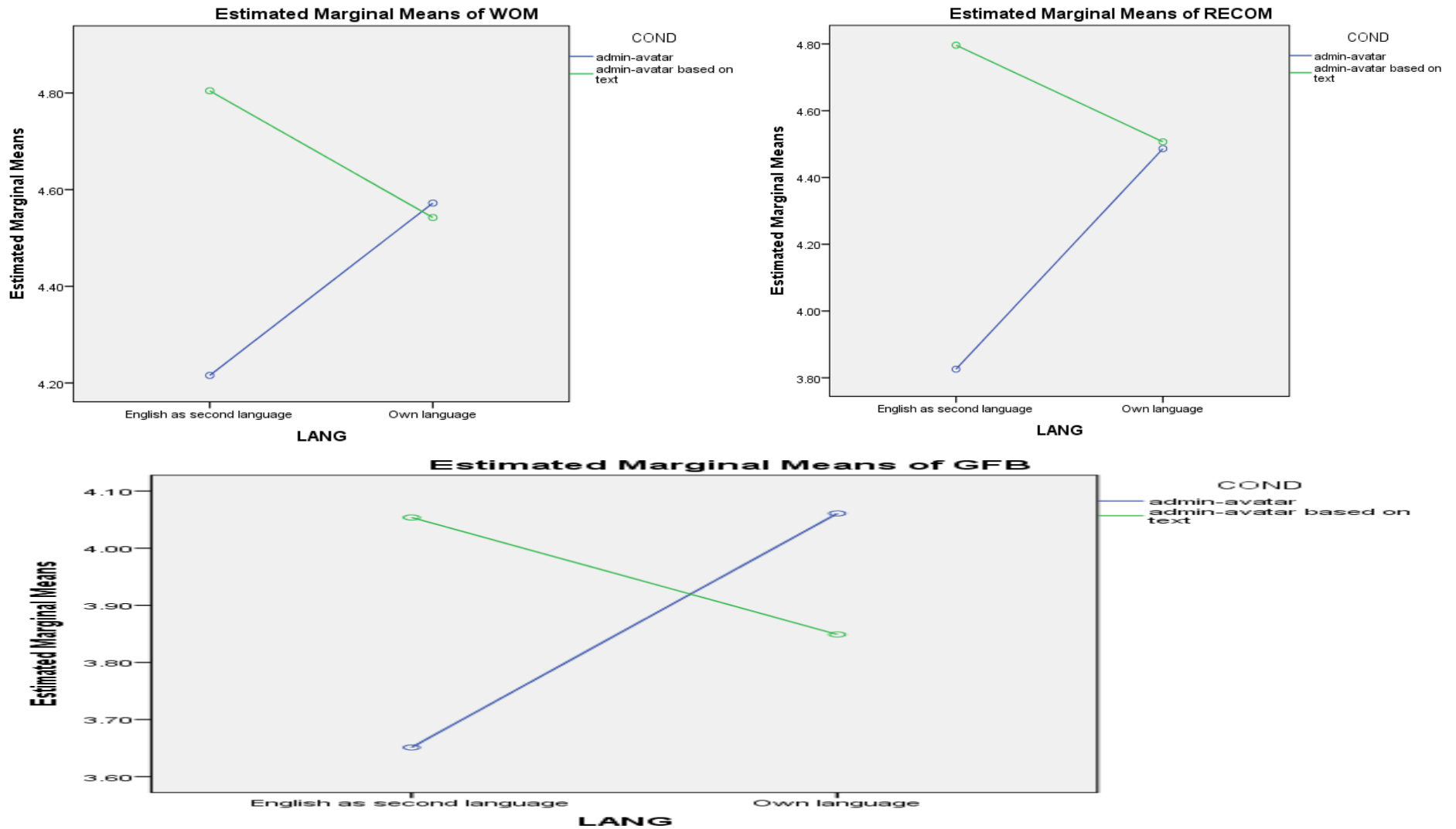


Figure 9. 12 Significant effect of interaction (word of mouth, recommendation and giving feedback)

There was a significant interaction effect between the admin-avatar condition and admin-avatar language on the word of mouth, recommendation and feedback constructs:  $F(1, 131) = 2.850, p < .1$ ;  $F(1, 131) = 5.532, p < .05$ ; and  $F(1, 131) = 4.228, p < .05$ , respectively. This indicates that the admin-avatar conditions (admin-avatar and admin-avatar based on text) were affected differently by the language used. Specifically, word of mouth was higher in the admin-avatar based on text condition ( $M = 4.8045$ ) than the admin-avatar ( $M = 4.2156$ ) condition when English was used (as a second language). In contrast, word of mouth was significantly higher in the admin-avatar ( $M = 4.5722$ ) than the admin-avatar based on text condition ( $M = 4.5422$ ) when the language used was the participant's own language. Regarding recommendation, it was significantly higher in the admin-avatar based on text condition ( $M = 4.7962$ ) than the admin-avatar ( $M = 3.8258$ ) condition when English was used (as a second language). In contrast, recommendation was slightly lower in the admin-avatar ( $M = 4.4864$ ) than the admin-avatar based on text condition ( $M = 4.5068$ ) when the language used was the participant's own language. Finally, giving feedback was significantly higher in the admin-avatar based on text condition ( $M = 4.0538$ ) than the admin-avatar ( $M = 3.6511$ ) condition when English was used (as a second language). In contrast, it was significantly higher in the admin-avatar ( $M = 4.0609$ ) condition than the admin-avatar based on text condition ( $M = 3.8489$ ) when the language used was the participant's own. Figures 9.11 and 9.12 confirm these results.

### **9.6.2 The serial multiple mediator model**

*P4: The constructs related to the website (hedonic characteristics, social presence, recall information, ease of using the website, usefulness and attitude towards the website) and brand (attitudes towards brand) mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and outcomes (word of mouth, recommendation and feedback).*

The serial multiple mediator model was adapted to examine the P4 (and its sub-propositions). The main assumption of this model was that a mediator causally influenced

another (Hayes, 2013). Therefore, the order of constructs was carefully considered when entering them for the mediation process, in line with the framework in Figure 9.13.

*P4a: The constructs related to the website (hedonic characteristics, social presence, recall information, ease of using the website, usefulness and attitude towards the website) and brand (attitudes towards brand) mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and word of mouth.*

The first sub-proposition (P4a) examined the relationships between the anthropomorphism, clarity, control and convenience constructs, as antecedents, and the word of mouth construct, as an outcome mediated by the constructs related to the website and brand. As the maximum number of mediators which could be used each time was four, the mediation process was conducted a number of times to include all these mediators. For example, the first mediation model/process included anthropomorphism as an antecedent and word of mouth as an outcome and hedonic characteristics, usefulness, attitude towards the website and attitude towards brand constructs as mediators. The second mediation process included anthropomorphism as an antecedent, word of mouth as an outcome and social presence, usefulness, attitude towards the website and attitude towards brand constructs as mediators. The total mediation for the antecedents and word of mouth construct included 16 processes. The indirect effects were identified in the SPSS PROCESS output, along with 95% bias-corrected bootstrap confidence intervals based on 10,000 bootstrap samples (Hayes, 2013).

As the paths/indirect effects options identified in the mediation processes were too numerous, Table 9.18 includes only the significant paths which were in line with the proposed framework. The number located underneath the construct name presents the estimated effect of that construct on the next construct. For instance, 'Clarity .83\*' means that the direct effect between the clarity construct and hedonic characteristics construct was significant at .83 ( $p = .0000$ ), and the direct effect between the hedonic characteristics

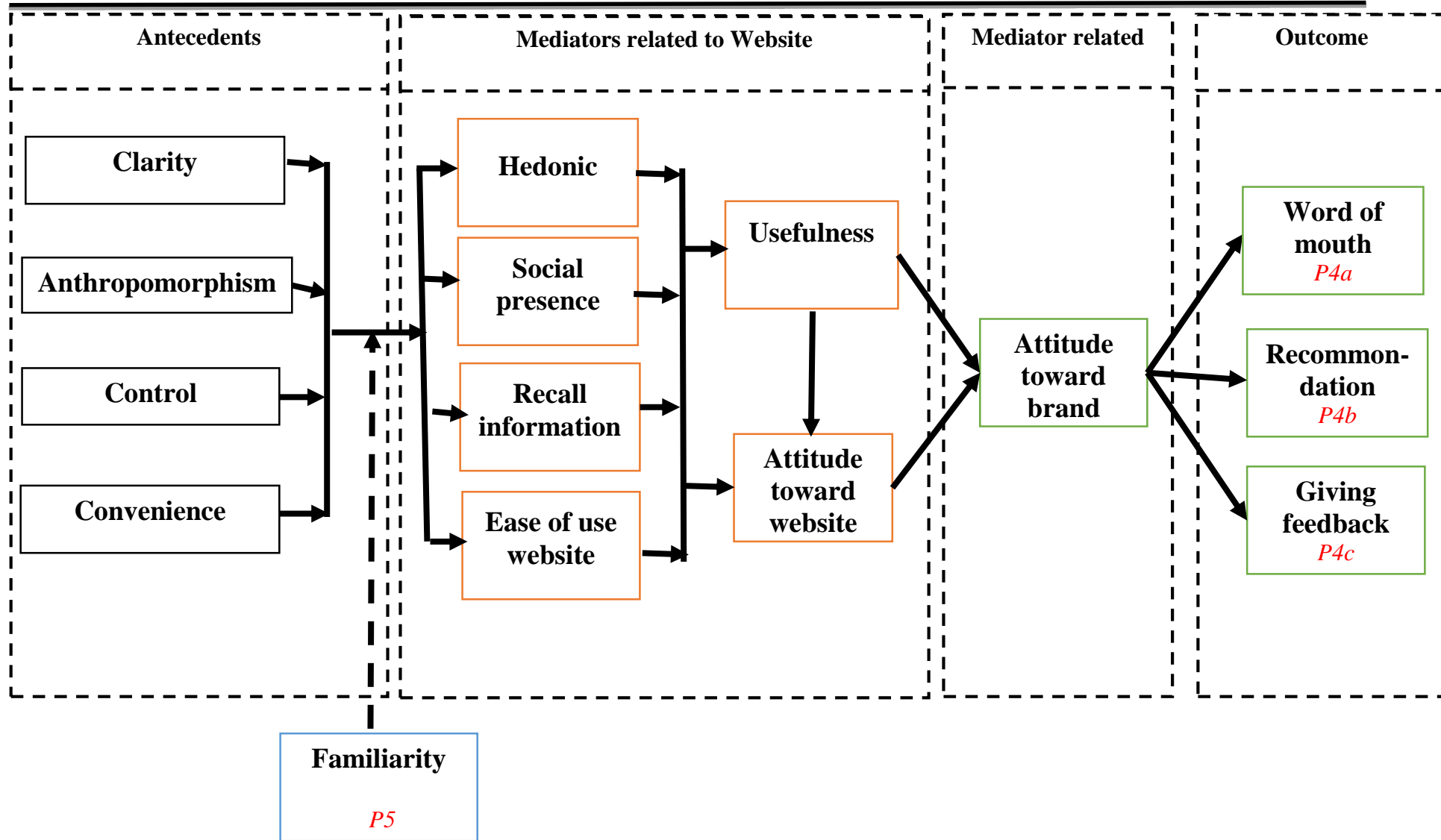


Figure 9. 13 Proposed model in the experimental study two



Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
<b>Clarity</b> .83*	Hedonic .14*	ATTW 1.63*	ATTU .78*		Word of mouth	.1474	.0730	.2717
<b>Clarity</b> .83*	Hedonic .28*	Usefulness .36*	ATTW 1.63*	ATTU .78*	Word of mouth	.1078	.0430	.2413
<b>Clarity</b> .45 (.0008)	Social presence .06 (.0007)	ATTW 1.32*	ATTU .78*		Word of mouth	.0292	.0099	.0744
<b>Clarity</b> .45 (.0008)	Social presence .21 (.0001)	Usefulness .44*	ATTW 1.32*	ATTU .78*	Word of mouth	.0435	.0146	.1216
<b>Clarity</b> .51*	Recall information .11*	ATTW 1.13 *	ATTU .77*		Word of mouth	.0482	.0147	.1262
<b>Clarity</b> .51*	Recall information .45*	Usefulness .38*	ATTW 1.13*	ATTU .77*	Word of mouth	.0764	.0290	.1727
<b>Clarity</b> .57*	Ease of use web .40*	Usefulness .46*	ATTW 1.4*	ATTU .78*	Word of mouth	.0741	.0219	.1830
<b>Anthropomorphism</b> 1.00*	Hedonic .14*	Attit-W 1.64*	Attit-U .79*		Word of mouth	.1789	.0982	.3072
<b>Anthropomorphism</b> 1.00*	Hedonic .27*	Usefulness .34*	Attit-W 1.64*	Attit-U .79*	Word of mouth	.1190	.0453	.2398
<b>Anthropomorphism</b> .67*	Social presence .05 (.0226)	Attit-W 1.49*	Attit-U .79*		Word of mouth	.0360	.0089	.0884
<b>Anthropomorphism</b> .67*	Social presence .14 (.0233)	Usefulness .41*	Attit-W 1.49*	Attit-U .79*	Word of mouth	.0449	.0121	.1159
<b>Anthropomorphism</b> .52*	Recall information .10*	Attit-W 1.35*	Attit-U .78*		Word of mouth	.0539	.0183	.1243
<b>Anthropomorphism</b> .52*	Recall information .43*	Usefulness .34*	Attit-W 1.35*	Attit-U .78*	Word of mouth	.0794	.0356	.1593
<b>Anthropomorphism</b> .42*	Ease of use web .25 (.0018)	Usefulness .41*	Attit-W 1.56*	Attit-U .79*	Word of mouth	.0543	.0208	.1291
<b>Control</b> .62*	Hedonic .12*	Attit-W 1.67*	Attit-U .78*		Word of mouth	.0989	.0495	.1788
<b>Control</b> .62*	Hedonic .24*	Usefulness .32*	Attit-W 1.67*	Attit-U .78*	Word of mouth	.0615	.0278	.1276
<b>Control</b> .27 (.0029)	Social presence .06 (.0008)	Attit-W 1.33*	Attit-U .77*		Word of mouth	.0167	.0052	.0393
<b>Control</b> .27 (.0029)	Social presence .20 (.0001)	Usefulness .38*	Attit-W 1.33*	Attit-U .77*	Word of mouth	.0210	.0062	.0543

<b>Control</b> <b>.53*</b>	Recall information .10*	Attit-W 1.17*	Attit-U .77*		Word of mouth	.0447	.0147	.1072
<b>Control</b> <b>.53*</b>	Recall information .40*	Usefulness .34*	Attit-W 1.17*	Attit-U .77*	Word of mouth	.0642	.0286	.1281
<b>Control</b> <b>.28*</b>	Ease of use web .26(.0004)	Usefulness .40*	Attit-W 1.40*	Attit-U .78*	Word of mouth	.0305	.0126	.0731
<b>Convenience</b> <b>.58*</b>	Hedonic .13*	Attit-W 1.64*	Attit-U .77*		Word of mouth	.0939	.0428	.1668
<b>Convenience</b> <b>.58*</b>	Hedonic .24*	Usefulness .31*	Attit-W 1.64*	Attit-U .77*	Word of mouth	.0539	.0234	.1247
<b>Convenience</b> <b>.24 (.0207)</b>	Social presence .07 (.0004)	Attit-W 1.30*	Attit-U .76*		Word of mouth	.0154	.0027	.0399
<b>Convenience</b> <b>.24 (.0207)</b>	Social presence .21*	Usefulness .38*	Attit-W 1.30*	Attit-U .76*	Word of mouth	.0190	.0028	.0510
<b>Convenience</b> <b>.68*</b>	Recall information .10 (.0001)	Attit-W 1.16*	Attit-U .76*		Word of mouth	.0603	.0245	.1337
<b>Convenience</b> <b>.68*</b>	Recall information .36*	Usefulness .36*	Attit-W 1.16*	Attit-U .76*	Word of mouth	.0771	.0361	.1750
<b>Convenience</b> <b>.27 (.0002)</b>	Ease of use web .26 (.0001)	Usefulness .41*	Attit-W 1.38*	Attit-U .77*	Word of mouth	.0303	.0105	.0821

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 9. 18 Summary of the significant indirect effect paths (word of mouth construct)**

construct and attitude towards the website construct, in the same path, was significant at .14\*.

Table 9.18 shows some values of the coefficient (direct effect) were greater than 1. For example, the direct effect between the attitude towards the website construct and the attitude towards brand construct was significantly 1.67 (i.e., the highest effect coefficient in all cases) at  $p = .0000$ . This might indicate multicollinearity. Each construct (predictor) had a tolerance level above .1 (.130) and VIF less than 10 (7.694), meaning there was no multicollinearity (Howitt & Cramer, 2011).

The first indirect effect, in Table 9.18, is the specific indirect effect of clarity on word of mouth through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $.83 (.14) (1.63) (.78) = .1474$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval is entirely above zero (.0730 to .2717). This path indicated that the clarity of condition would increase the hedonic characteristics (because .83 is positive), which was associated with an enhancement in the attitude towards the website. The improvement of attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the word of mouth. The rest of the indirect effects in Table 9.18 can be interpreted in the same way as the first indirect effect. Table 9.18 is divided into four main sections; each shows the paths of one of the antecedents (e.g., clarity, control) on the mediators and outcome (word of mouth).

*P4b: The constructs related to the website (hedonic characteristics, social presence, recall information, ease of using the website, usefulness and attitude towards the website) and brand (attitudes towards brand) mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and recommendation.*

The second sub-proposition (P4b) examined the relationships between the anthropomorphism, clarity, control and convenience constructs, as antecedents, and the recommendation construct, as an outcome, mediated by the constructs related to the website

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and brand. As with the first sub-proposition, the total mediation for antecedents and the recommendation construct resulted in 16 processes. Table 9.19 shows only the significant paths which are in line with the proposed framework. The number located underneath the construct name presents the estimated effect of that construct on the next construct. Table 9.19 also shows some values of the coefficient (direct effect) greater than 1. For example, the direct effect between the attitude towards the website construct and the attitude towards brand construct was significantly 1.67 (i.e., the highest effect coefficient in all cases) at  $p = .0000$ . Each of these constructs (predictors) had a tolerance level above .1 (.138) and VIF less than 10 (7.269), indicating no multicollinearity (Howitt & Cramer, 2011).

The first indirect effect, in Table 9.19, is the specific indirect effect of clarity on recommendation through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $.83 (.14) (1.63) (.78) = .1477$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval is entirely above zero (.0825 to .2780). This path indicated that the clarity condition would increase the hedonic characteristics (because .83 is positive), which was associated with an enhancement in the attitude towards the website. The improvement of attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the recommendation. The remaining indirect effects in Table 9.19 can be interpreted in the same way. Table 9.19 is divided into four main sections; each one shows the paths of one of the antecedents (e.g., clarity) on the mediators and outcome (recommendation).

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
<b>Clarity</b> .83*	Hedonic .14*	ATTW 1.63*	ATTU .78*		Recommendation	.1477	.0825	.2780
<b>Clarity</b> .83*	Hedonic .28*	Usefulness .36*	ATTW 1.63*	ATTU .78*	Recommendation	.1091	.0444	.2579
<b>Clarity</b> .45 (.0008)	Social presence .06 (.0007)	ATTW 1.32*	ATTU .78*		Recommendation	.0293	.0101	.0749
<b>Clarity</b> .45 (.0008)	Social presence .21 (.0001)	Usefulness .44*	ATTW 1.32*	ATTU .78*	Recommendation	.0437	.0150	.1204
<b>Clarity</b> .51*	Recall information .11*	ATTW 1.13 *	ATTU .76*		Recommendation	.0481	.0149	.1231
<b>Clarity</b> .51*	Recall information .45*	Usefulness .38*	ATTW 1.13*	ATTU .76*	Recommendation	.0762	.0308	.1743
<b>Clarity</b> .57*	Ease of use web .25 (.0025)	Usefulness .46*	ATTW 1.4*	ATTU .78*	Recommendation	.0739	.0222	.1817
<b>Anthropomorphism</b> 1.00*	Hedonic .14*	Attit-W 1.64*	Attit-U .81*		Recommendation	.1844	.1061	.3265
<b>Anthropomorphism</b> 1.00*	Hedonic .27*	Usefulness .34*	Attit-W 1.64*	Attit-U .81*	Recommendation	.1227	.0479	.2539
<b>Anthropomorphism</b> .67*	Social presence .05 (.0226)	Attit-W 1.49*	Attit-U .81*		Recommendation	.0368	.0090	.0848
<b>Anthropomorphism</b> .67*	Social presence .14 (.0233)	Usefulness .41*	Attit-W 1.49*	Attit-U .81*	Recommendation	.0459	.0114	.1073
<b>Anthropomorphism</b> .52*	Recall information .10*	Attit-W 1.35*	Attit-U .79*		Recommendation	.0551	.0184	.1322
<b>Anthropomorphism</b> .52*	Recall information .43*	Usefulness .34*	Attit-W 1.35*	Attit-U .79*	Recommendation	.0811	.0373	.1703
<b>Anthropomorphism</b> .42*	Ease of use web .25 (.0018)	Usefulness .41*	Attit-W 1.56*	Attit-U .81*	Recommendation	.0557	.0216	.1297
<b>Control</b> .62*	Hedonic .12*	Attit-W 1.67*	Attit-U .77*		Recommendation	.0984	.0521	.1690
<b>Control</b> .62*	Hedonic .24*	Usefulness .32*	Attit-W 1.67*	Attit-U .77*	Recommendation	.0611	.0285	.1166
<b>Control</b> .27 (.0029)	Social presence .06 (.0008)	Attit-W 1.34*	Attit-U .76*		Recommendation	.0163	.0054	.0412
<b>Control</b> .27 (.0029)	Social presence .20 (.0001)	Usefulness .38*	Attit-W 1.34*	Attit-U .76*	Recommendation	.0205	.0056	.0511
<b>Control</b> .53*	Recall information .10 (.0001)	Attit-W 1.17*	Attit-U .74*		Recommendation	.0434	.0161	.1015

<b>Control</b> <b>.53*</b>	Recall information .40*	Usefulness .34*	Attit-W 1.17*	Attit-U .74*	Recommendation	.0624	.0297	.1221
<b>Control</b> <b>.28*</b>	Ease of use web .26(.0004)	Usefulness .40*	Attit-W 1.40*	Attit-U .76*	Recommendation	.0299	.0129	.0697
<b>Convenience</b> <b>.58*</b>	Hedonic .13*	Attit-W 1.64*	Attit-U .77*		Recommendation	.0940	.0461	.1677
<b>Convenience</b> <b>.58*</b>	Hedonic .24*	Usefulness .31*	Attit-W 1.64*	Attit-U .77*	Recommendation	.0539	.0217	.1253
<b>Convenience</b> <b>.24 (.0207)</b>	Social presence .07 (.0004)	Attit-W 1.30*	Attit-U .75*		Recommendation	.0151	.0023	.0422
<b>Convenience</b> <b>.24 (.0207)</b>	Social presence .21*	Usefulness .38*	Attit-W 1.30*	Attit-U .75*	Recommendation	.0186	.0034	.0525
<b>Convenience</b> <b>.68*</b>	Recall information .10 (.0001)	Attit-W 1.16*	Attit-U .74*		Recommendation	.0587	.0259	.1315
<b>Convenience</b> <b>.68*</b>	Recall information .36*	Usefulness .36*	Attit-W 1.16*	Attit-U .74*	Recommendation	.0751	.0343	.1775
<b>Convenience</b> <b>.27 (.0002)</b>	Ease of use web .26 (.0001)	Usefulness .41*	Attit-W 1.38*	Attit-U .76*	Recommendation	.0300	.0109	.0808

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 9. 19 Summary of the significant indirect effect paths (recommendation construct)**

*P4c: The constructs related to the website (hedonic characteristics, social presence, recall information, ease of using the website, usefulness and attitude towards the website) and brand (attitudes towards brand) mediate the relationships between the antecedents (constructs of anthropomorphism, clarity, control and convenience) and feedback.*

The third sub-proposition (P4b) examined the relationships between the anthropomorphism, clarity, control and convenience constructs, as antecedents, and the feedback construct, as an outcome mediated by the constructs related to the website and brand. The total mediation for antecedents and the recommendation construct again resulted in 16 processes; Table 9.23 includes only the significant paths which are in line with the proposed framework. Table 9.20 shows some values of the coefficient (direct effect) greater than 1. For example, the direct effect between the attitude towards the website construct and the attitude towards brand construct was significantly 1.67 (i.e., the highest effect coefficient in all cases) at  $p = .0000$ . Each of these constructs (predictors) had a tolerance level above .1 (.161) and VIF less than 10 (6.230). This means that there was no multicollinearity (Howitt & Cramer, 2011).

The first indirect effect, in Table 9.20, is the specific indirect effect of clarity on giving feedback through hedonic characteristics, attitude towards the website and attitude towards brand, estimated as total indirect effect =  $.83 (.14) (1.63) (.43) = .0819$ . This indirect effect is interpreted as significantly positive as the bootstrap confidence interval is entirely above zero (.0307 to .1778). This path indicated that the clarity of condition would increase the hedonic characteristics (because .83 is positive), which was associated with an enhancement in the attitude towards the website. The improvement of attitude towards the website was linked with the enhanced attitude towards brand which, in turn, increased the probability to give feedback. The remaining indirect effects in Table 9.20 can be interpreted in the same way. Table 9.20 is divided into four main sections; each one shows the paths of one of the antecedents (e.g., clarity) on the mediators and outcome (giving feedback).

Antecedent	Mediator 1	Mediator 2	Mediator 3	Mediator 4	Outcome	Indirect effect	Bootstrap	
							BootLLCI	BootULCI
<b>Clarity</b> <b>.83*</b>	Hedonic .14*	ATTW 1.63*	ATTU .43*		Giving feedback	.0819	.0307	.1778
<b>Clarity</b> <b>.83*</b>	Hedonic .28*	Usefulness .36*	ATTW 1.63*	ATTU .43*	Giving feedback	.0599	.0217	.1682
<b>Clarity</b> <b>.45 (.0008)</b>	Social presence .06 (.0007)	ATTW 1.32*	ATTU .44*		Giving feedback	.0164	.0051	.0453
<b>Clarity</b> <b>.45 (.0008)</b>	Social presence .21 (.0001)	Usefulness .44*	ATTW 1.32*	ATTU .44*	Giving feedback	.0244	.0067	.0851
<b>Clarity</b> <b>.51*</b>	Recall information .11*	ATTW 1.13 *	ATTU .76*		Giving feedback	.0279	.0076	.0849
<b>Clarity</b> <b>.51*</b>	Recall information .45*	Usefulness .38*	ATTW 1.13*	ATTU .76*	Giving feedback	.0442	.0135	.1218
<b>Clarity</b> <b>.57*</b>	Ease of use web .06 (.0332)	ATTW 1.4*	ATTU .46*		Giving feedback	.0224	.0004	.0575
<b>Clarity</b> <b>.57*</b>	Ease of use web .25 (.0025)	Usefulness .46*	ATTW 1.4*	ATTU .46*	Giving feedback	.0436	.0131	.1269
<b>Anthropomorphism</b> <b>1.00*</b>	Hedonic .14*	Attit-W 1.64*	Attit-U .42*		Giving feedback	.0951	.0402	.2003
<b>Anthropomorphism</b> <b>1.00*</b>	Hedonic .27*	Usefulness .34*	Attit-W 1.64*	Attit-U .42*	Giving feedback	.0633	.0203	.1648
<b>Anthropomorphism</b> <b>.67*</b>	Social presence .05 (.0226)	Attit-W 1.49*	Attit-U .42*		Giving feedback	.0193	.0052	.0565
<b>Anthropomorphism</b> <b>.67*</b>	Social presence .14 (.0233)	Usefulness .41*	Attit-W 1.49*	Attit-U .42*	Giving feedback	.0241	.0058	.0787
<b>Anthropomorphism</b> <b>.52*</b>	Recall information .10*	Attit-W 1.35*	Attit-U .42*		Giving feedback	.0295	.0087	.0831
<b>Anthropomorphism</b> <b>.52*</b>	Recall information .43*	Usefulness .34*	Attit-W 1.35*	Attit-U .42*	Giving feedback	.0435	.0143	.1161
<b>Anthropomorphism</b> <b>.42*</b>	Ease of use web .25 (.0018)	Usefulness .41*	Attit-W 1.56*	Attit-U .44*	Giving feedback	.0302	.0110	.0869
<b>Control</b> <b>.62*</b>	Hedonic .12*	Attit-W 1.67*	Attit-U .44*		Giving feedback	.0558	.0241	.1163
<b>Control</b> <b>.62*</b>	Hedonic .24*	Usefulness .32*	Attit-W 1.67*	Attit-U .44*	Giving feedback	.0347	.0124	.0838
<b>Control</b> <b>.27 (.0029)</b>	Social presence .06 (.0008)	Attit-W 1.34*	Attit-U .44*		Giving feedback	.0095	.0031	.0275
<b>Control</b> <b>.27 (.0029)</b>	Social presence .20 (.0001)	Usefulness .38*	Attit-W 1.34*	Attit-U .44*	Giving feedback	.0119	.0028	.0391



<b>Control</b> <b>.53*</b>	Recall information .10 (.0001)	Attit-W 1.17*	Attit-U .45*		Giving feedback	.0260	.0078	.0729
<b>Control</b> <b>.53*</b>	Recall information .40*	Usefulness .34*	Attit-W 1.17*	Attit-U .45*	Giving feedback	.0373	.0128	.0944
<b>Control</b> <b>.28*</b>	Ease of use web .26(.0004)	Usefulness .40*	Attit-W 1.40*	Attit-U .47*	Giving feedback	.0184	.0073	.0522
<b>Convenience</b> <b>.58*</b>	Hedonic .13*	Attit-W 1.64*	Attit-U .44*		Giving feedback	.0533	.0200	.1179
<b>Convenience</b> <b>.58*</b>	Hedonic .24*	Usefulness .31*	Attit-W 1.64*	Attit-U .44*	Giving feedback	.0306	.0106	.0868
<b>Convenience</b> <b>.24 (.0207)</b>	Social presence .07 (.0004)	Attit-W 1.30*	Attit-U .44*		Giving feedback	.0089	.0016	.0294
<b>Convenience</b> <b>.24 (.0207)</b>	Social presence .21*	Usefulness .38*	Attit-W 1.30*	Attit-U .44*	Giving feedback	.0109	.0017	.0387
<b>Convenience</b> <b>.68*</b>	Recall information .10 (.0001)	Attit-W 1.16*	Attit-U .45*		Giving feedback	.0354	.0117	.0975
<b>Convenience</b> <b>.68*</b>	Recall information .36*	Usefulness .36*	Attit-W 1.16*	Attit-U .45*	Giving feedback	.0453	.0150	.1325
<b>Convenience</b> <b>.27 (.0002)</b>	Ease of use web .26 (.0001)	Usefulness .41*	Attit-W 1.38*	Attit-U .47*	Giving feedback	.0184	.0060	.0588

\* P= .0000 each number is the amount of coefficient of the construct with the next one

**Table 9. 20 Summary of the significant indirect effect paths (giving feedback construct)**

Interaction		Outcome	Effect	p	Bootstrap	
					BootLLCI	BootULCI
<b>ANTHR</b>	<b>X FAMIL</b>	Hedonic	-.0231	.8315	-.2370	.1909
<b>ANTHR</b>	<b>X FAMIL</b>	Social presence	-.0482	.5745	-.2177	.1212
<b>ANTHR</b>	<b>X FAMIL</b>	Recall information	-.0960	.4348	-.3383	.1464
<b>ANTHR</b>	<b>X FAMIL</b>	Ease of use website	-.0195	.7828	-.1593	.1203
<b>CLAR</b>	<b>X FAMIL</b>	Hedonic	-.1472	.2616	-.4054	.1110
<b>CLAR</b>	<b>X FAMIL</b>	Social presence	-.1075	.3301	-.3251	.1101
<b>CLAR</b>	<b>X FAMIL</b>	Recall information	-.1453	.2952	-.4187	.1282
<b>CLAR</b>	<b>X FAMIL</b>	Ease of use website	.0201	.8437	-.1816	.2219
<b>CONTR</b>	<b>X FAMIL</b>	Hedonic	-.0505	.7239	-.3324	.2315
<b>CONTR</b>	<b>X FAMIL</b>	Social presence	-.0140	.8846	-.2042	.1763
<b>CONTR</b>	<b>X FAMIL</b>	Recall information	-.0254	.7741	-.1999	.1491
<b>CONTR</b>	<b>X FAMIL</b>	Ease of use website	.0715	.2400	-.0484	.1914
<b>CONV</b>	<b>X FAMIL</b>	Hedonic	-.1877	.0261	-.3527	-.0227
<b>CONV</b>	<b>X FAMIL</b>	Social presence	-.0839	.2872	-.2391	.0714
<b>CONV</b>	<b>X FAMIL</b>	Recall information	.0418	.6250	-.1269	.2105
<b>CONV</b>	<b>X FAMIL</b>	Ease of use website	.0670	.3927	-.0876	.2216

**Table 9. 21 Summary of the interaction and conditional effect of the four antecedents (anthropomorphism, clarity, control, convenience) on four consequences (hedonic, social presence, recall information and ease of use website) at values of familiarity construct as moderator**

### 9.6.3 *The simple moderator model*

*P5: The familiarity construct moderates the relationships between antecedent constructs (anthropomorphism, clarity, control and convenience) and constructs related to the website (particularly hedonic characteristics, social presence, recall information and ease of using the website).*

The last proposition (P5) examined the moderating role of familiarity in the relationships between antecedent constructs such as anthropomorphism, clarity, control and convenience and the constructs related to the website, such as hedonic characteristics, social presence, recall information and ease of using the website. The left side of Table 9.21 shows that moderation has a non-significant interaction effect with all antecedents except in the case of interaction between familiarity and convenience with the hedonic characteristics construct as the outcome. In this case, the interaction is significant:  $b = -.1877$ , 95% CI  $[-.3527$  to  $-.0227]$ , which does not include zero,  $p < .05$ . Thus, the relationship between the convenience and hedonic characteristics is moderated by familiarity. It is also valuable to examine the simple slopes (Table 9.21).

## 9.7 Chapter summary

This chapter first presented the experimental design for study two: a factorial design between the admin-avatar condition and the language used. This section included the design of the study, participants' characteristics, materials used during the experiments and procedures followed to conduct these experiments. The next sections were related to the data analysis and results. These sections started with a preliminary data analysis, including the accuracy of data files, missing data, testing outliers and normality. The confirmatory factor analysis technique was used for items. The tests of convergent validity, composite reliability and discriminant validity were also conducted. After that, the common method bias technique was adapted using the comprehensive confirmatory factor analysis marker technique from Williams et al. (2010). The last section in this chapter addressed the testing of the propositions using three main techniques: factorial ANOVA, the serial multiple mediator model and moderation model. The results from the analysis will be discussed in detail in Chapter Ten.

## **Chapter Ten: Discussion**

### **10.1 Introduction**

Having examined the objectives of this thesis through both qualitative and quantitative inquiries in previous chapters, this chapter discusses and interprets the results in relation to extant literature. The chapter is divided into two main sections. The first section discusses the results of the systematic literature reviews with respect to the current studies addressing the avatar concept, particularly its current definitions, and compares them with the comprehensive definition of the admin-avatar concept. With the conceptual frameworks taken from the emerged taxonomy, the second section focuses on the outcomes of the two experimental studies in relation to the qualitative results and the literature. Figure 10.1 shows the map of Chapter Ten.

### **10.2 Current studies, definitions of avatar concept and the comprehensive definition of the admin-avatar concept**

A comprehensive systematic literature review was conducted to identify how the avatar concept has been defined and conceptualised in the business disciplines in general and marketing discipline in particular. The results revealed that the avatar concept is considered a contemporary concept in all investigated disciplines, particularly in business and marketing. The majority of the studies which examined the avatar concept were published in 2000 or later. Comparing the different disciplines in these studies, scholars in business and marketing disciplines have published limited articles investigating the avatar concept. The review showed an urgent need for further investigations of the avatar concept because of the low number of articles (130 of 329 total articles in 10 search databases) examining this concept in detail.

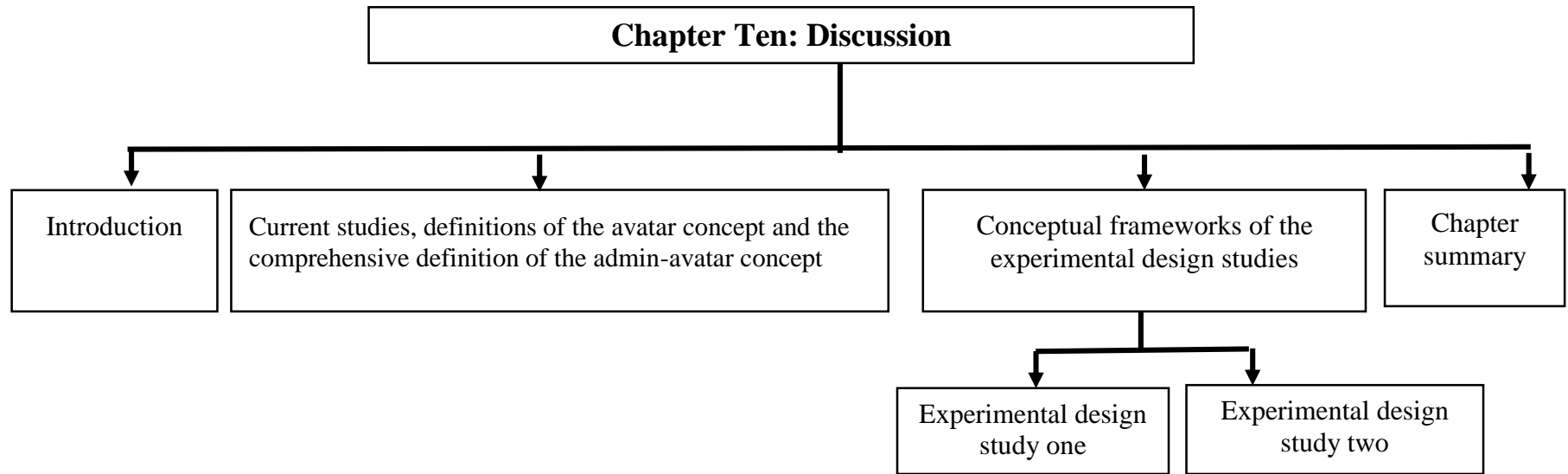


Figure 10. 1 Chapter Ten map

Therefore, it was considered evidence or an indicator of the limited attention given to investigating the avatar concept and the need for further examination, particularly from the marketing perspective. In addition, the results showed that 11 marketing journals published only 55 articles on the avatar topic between 2000 and 2013, highlighting the considerable lack of marketing studies on the avatar concept and confirming the findings of McGoldrick et al. (2008). Other results revealed a low rate (14.29%) of all cited articles from the marketing discipline, indicating the low publishing rate of avatar articles in marketing disciplines.

An author co-citation analysis was conducted to identify the important studies and influential scholars. The results of the factor analysis revealed that most authors/subfields are related to the computer science discipline. Therefore, the most influential discipline in publishing avatar studies in business and marketing disciplines is the computer science discipline, represented by sub-disciplines such as human–computer interaction, virtual reality or environment and the artificial intelligence subfields. The ACA approach also helped show the most influential scholars.

An extensive discussion about the different terminologies related to avatars was conducted. It was observed that a number of scholars used some of these terms in an interchangeable way. However, it was valuable to note the significant relationships indicating some similar and different points between these terms and avatars (see Chapter Three). This helped position the current research and differentiate the avatar concept. One of the key areas lacking investigation in the marketing literature is how the admin-avatar concept should be defined and conceptualised. The literature presents a general avatar concept, where the avatar can represent the users (e.g., consumers, agents, salespersons, gamers). Consequently, it was posited that defining and conceptualising the admin-avatar as representing the organisation and doing its administrative work are crucial for filling this

gap in the literature because administrative work is considered the backbone for most sectors (e.g., universities, hospitals, banks, public sector/government). Therefore, the admin-avatar as a tool which helps do this kind of work should be extensively investigated.

As there was no consensus on the definition of the avatar concept, it was posited that there was a need to find an appropriate definition for the admin-avatar concept. Based on the qualitative data analysis, an admin-avatar definition emerged. This definition differs from the extant definitions that address the admin-avatar as specific concept. It elucidates the main functions of the admin-avatar: providing information to users and responding to their queries. Furthermore, contrary to the majority of extant definitions, this definition clearly asserts that the admin-avatar is closely similar to the real demonstrator of the organisation by imitating his/her cues and behaviours. Finally, the admin-avatar definition includes two main characteristics: the oral and visual format. The majority of the current definitions ignored both characteristics or just focused on the visual cues.

Two key aspects were not presented in the qualitative data but were found in a number of existing definitions — namely, representation and dimensionality. Therefore, these aspects were added to the admin-avatar definition and defined as a three-dimensional animated graphical interface that represents and imitates the organisation administrator or agent by providing information and responding to queries through the website both orally and visually. The qualitative data analysis also showed the admin-avatar characteristics, classifying them into three main categories (i.e., human being, visual, audible), and programming characteristics. The admin-avatar includes some human characteristics, such as the ability to speak, a human face and parts of the body (e.g., shoulder and arms), expressions and gender. The visual characteristics refer to the animated interface, graphical and expressional features (nonverbal cues). In addition, all the provided information is spoken. This means that the admin-avatar is audible and programmed with specific

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information. The last characteristic was important in the current research because there have been some suggestions, based on the qualitative results, to create a live admin-avatar to respond to queries immediately. In other words, a non-programmed admin-avatar is preferable in some cases.

### **10.3 Conceptual framework of the experimental design studies**

This section discusses the results of the two frameworks examined in the two experimental design studies and links them with the qualitative results of the current research as well as identifies the extent to which similar consequences appeared in the avatar literature.

#### ***10.4.1 Experimental design study one***

This study aimed to compare three conditions of providing information to website visitors (e.g., students): written information style (as a control condition or variable), admin-avatar and admin-avatar based on text (manipulated variables). It also aimed to examine the impact of different dimensions (clarity, assistance role, competence, control, convenience and communication) of each condition on consequences related to the website (hedonic characteristics, recall information, ease of using the website, usefulness and attitude towards the website) and consequences related to brand (pride, attitude towards brand, propensity to leave and potential to join). A within-subject experimental design (repeated measures) was used. Each participant was exposed to the three conditions (admin-avatar, admin-avatar based on text and written information). The randomisation of participants was undertaken to isolate the effects of the manipulation of the independent variables and eliminate all the systematic effects on the participants' behaviour. The preliminary data analysis techniques included proofreading the original data against the computerised data, testing for outliers and testing for normality.

As some scales included items from the qualitative results, confirmatory factor analysis (CFA) was conducted in three stages. The CFA results suggested six antecedents: clarity,



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communication, assistance, competence, control and convenience. The six-factor model consisting of 17 items provided a satisfactory model fit, with loading estimates ranging from .66 to .94. With respect to the consequences related to the website, the CFA results suggested a five-factor model including attitude towards the website (novelty, attractiveness, and likeability), ease of using the website, information recall, hedonic characteristics and usefulness. After the removal of certain items, the five-factor, 17-item model provided satisfactory model fit, with loading estimates ranging from .55 to .97. Finally, some items also were removed in the consequences related to the brand — namely, attitudes towards the brand (image, modernity and brand recall), pride, potential to join and propensity to leave. After the removal of these items, the four-factor, 17-item model provided satisfactory model fit, with loading estimates ranging from .41 to .97. Support for convergent validity was found given that all items loaded significantly on their proposed constructs, composite reliabilities (CR) for each construct were above .7, and the average variance extracted (AVE) estimates for each construct exceeded the .5 cut-off, providing evidence of convergent validity of all constructs (antecedents and consequences). Following this, the discriminant validity of all constructs was carefully evaluated. Overall, support for discriminant validity was found given that all AVE values exceeded the correlation squared for each pair of constructs. Next, the comprehensive CFA technique, also called the CFA marker variable (Williams et al., 2010) was adopted; the results showed that common method bias was not a likely contaminant of both loading and correlation estimates results. Therefore, common method bias was unlikely to be a concern for this study.

In testing the propositions, two main techniques were used: repeated measures and the serial multiple mediator model. The repeated measures technique was used to show the significance among three conditions: admin-avatar, admin-avatar based on text and written information. For the antecedents no significant difference was found among the three conditions except for the communication construct. Communication in the written

information condition was better than the admin-avatar based on text and the admin-avatar conditions; communication in the admin-avatar based on text condition was better than the admin-avatar condition. These results are not in line with most of the previous studies or the qualitative results of the current research. For example, the avatars were shown to improve interpersonal communication with consumers as they are used as a rich communication medium for accessing communications, much like face-to-face interactions (Lee et al., 2005; Li et al., 2011; Schwarz et al., 2012) by communicating with rich emotional messages (Takahashi et al., 2005). Avatars can make gestures to convey the individual's intention to communicate; the limited gestures and difficulties in moving lead to reduced effectiveness in avatars, reflecting the limitations of communication via technology (Goel et al., 2011; Sutcliffe & Alrayes, 2012). However, some studies supported the results from this study — namely, no evidence indicated that avatars appeared to motivate many users more effectively than simple text communication —as some students felt the graphical environment was worse, contradicting the media richness theory (Sutcliffe & Alrayes, 2012). In addition, a number of participants in the qualitative phase of the current research cited that the admin-avatar was programmed, which was considered to be a main barrier for communication with the brand. They suggested using a live admin-avatar which responded immediately to users. This result supports previous research revealing that users of avatars tended to prefer receiving messages in a conversational way rather than a monologue (Nishida, 2002).

For the consequences related to the website, only hedonic characteristics and the attitude towards the website were significantly different in both the admin-avatar and admin-avatar based on text conditions compared to the written information condition. The admin-avatar and the admin-avatar based on text conditions are significantly more hedonic, attractive, novel and likable than the written information. These results support the qualitative phase results. For other construct such as ease of using the website, no differences emerged among

the three conditions. These results do not support the qualitative phase results which, for example, showed that written information helps users recall the information more than the admin-avatar condition.

For the consequences related to the brand, only the attitude towards the brand was significantly different in both the admin-avatar and admin-avatar based on text condition compared to the written information condition. However, there was no significant difference between the admin-avatar and admin-avatar based on text conditions. Users' perceptions differed significantly with respect to the brand image, modernity and recall in the admin-avatar and the admin-avatar based on text conditions from the written information condition. These results support the qualitative phase results. In contrast, no differences emerged among the three conditions in terms of the pride, potential to join and propensity to leave; this finding does not support the qualitative phase results.

Table 10.1 summarises the main results of the comparisons between the qualitative and quantitative results. For example, the degree of control was shown in the qualitative phase results to be an admin-avatar dimension which significantly differs compared to the control in the written information condition/case. However, the quantitative results showed no differences among the admin-avatar, admin-avatar based on text and written information conditions with respect to the control dimension.

Conditions	Qualitative phase (emerged constructs)	Quantitative results (examined constructs)
<b>Admin-avatar vs. admin-avatar based on text vs. written information</b>	Control	Rejected
	Convenience	Rejected
	Communication	Supported
	Competence	Rejected
	Assistance	Rejected
	Clarity	Rejected
	Hedonic	Supported
	Usefulness	Rejected
	Information recall	Rejected
	Ease of use website	Rejected
	Attitude toward website	Supported
	Attractiveness	Supported
	Novelty	Supported
	Likeability	Supported
	Pride	Rejected
	Attitude toward the brand	Supported
	Image	Supported
	Modernity	Supported
Brand recall	Supported	
Potential to join	Rejected	
Propensity to leave	Rejected	

**Table 10. 1 Comparisons between the experimental study results (repeated measures) in the light of the qualitative phase results.**

The serial multiple mediator model was used to show the cause of each construct on the next ones. For example, it measured the causal influence of an antecedent on the first mediator, then the causal influence of the first mediator on the second mediator, continuing this approach until reaching the outcome. The results showed that each antecedent influenced the potential to join the brand mediated by the consequences related to the website and brand, as proposed in the first framework. In contrast, no antecedent influenced the propensity to leave mediated by the consequences related to the website and brand. Based on these results, it can be said that the addition of an admin-avatar positively influences potential students' decision to join the brand, but does not negatively influence students' decision to leave the brand. Both results support the qualitative results as most participants emphasised the likelihood of joining the brand rather than leaving it.

In terms of the influence of antecedents on the hedonic characteristics, information recall and ease of using the website, some important points should be explored. First, the most

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highly influential antecedent on hedonic characteristics is competence (.68), whereas the least influential is communication (.21). Second, the most highly influential antecedents on information recall are competence and control (.87 for each), whereas the least influential is communication (.47). Third, the most highly influential antecedents on ease of using the website are clarity and competence (.77 and .7), whereas the least influential is communication (.38). Thus, competence is one of the most important dimensions as it is highly influential on the admin-avatar's hedonic characteristics, information recall and ease of using the website. In contrast, communication is the least influential on the three constructs. Controlling the admin-avatar helps recall the information, and its clarity significantly contributes to facilitating website use.

#### ***10.4.2 Experimental design study two***

The second experimental study aimed to examine whether the effect of the admin-avatar condition (based on text or not) and its language significantly differs on the various dimensions, users' attitudes and behaviours. It also aimed to examine the impact of the different dimensions (anthropomorphism, clarity, control, convenience) on the outcomes (e.g., word of mouth, feedback and recommendation) mediated by consequences related to the website (hedonic characteristics, recall information, ease of using the website, social presence, usefulness and attitude towards the website) and consequences related to brand (attitude towards brand). Finally, it examined whether familiarity with the admin-avatar moderates the relationships between the different dimensions and the consequences related to the website, particularly hedonic characteristics, recall information, ease of using the website and social presence. A 2×2 factorial design was used to manipulate the two independent variables: the admin-avatar condition and the admin-avatar's language. The first factor included two levels — namely, admin-avatar and admin-avatar based on text. The second factor also included two levels — namely, English language (formal language) and user's own language (native language/mother tongue). Randomisation was used to

achieve a true score and reduce error. The preliminary data analysis techniques were the same as those used in study one. Testing for outliers and normality was also conducted.

Meanwhile, the CFA results suggested four antecedents and a moderator after removing certain items. The antecedents were clarity, control, convenience, anthropomorphism and familiarity. After the removal of the items, the six-factor, 16-item model provided satisfactory model fit, with loading estimates ranging from .60 to .88. Some items also were removed in the consequences related to the website: attitude towards the website (novelty, attractiveness, and likeability), ease of using the website, information recall, hedonic characteristics, social presence and usefulness. After the removal of the items, the six-factor, 19-item model provided satisfactory model fit, with loading estimates ranging from .61 to .93. Finally, some items were removed in the consequences related to the brand: attitudes towards the brand (image, modernity and brand recall), word of mouth, recommendation and feedback. After the removal of the items, the four-factor, 14-item model provided satisfactory model fit, with loading estimates ranging from .53 to .93. Convergent validity and composite reliabilities (CR) were supported for each construct. Discriminant validity of all these constructs was carefully evaluated and supported for each pair of constructs. Next, the comprehensive CFA technique was adapted; the results showed that common method bias was unlikely to be a concern for this study.

In testing the propositions, three main techniques were used: factorial design (two-way independent ANOVA), the serial multiple mediator model and the simple moderator model. The factorial design was used to show the significance between two conditions: the admin-avatar condition (based on text or not) and the admin-avatar's language (English or user's own language). For the antecedents, no significant difference emerged between the two factors except for the anthropomorphism construct (in the admin-avatar condition), familiarity (in the admin-avatar language) and convenience (in the interaction between the

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admin-avatar condition and its language). There was a significant main effect of the admin-avatar condition on the anthropomorphism of the admin-avatar ( $p < .1$ ). The mean test revealed that the anthropomorphism was significantly lower with the admin-avatar (regardless of the language) than the admin-avatar based on text. However, no significant main effect occurred for the admin-avatar condition on the other constructs (clarity, control, convenience and familiarity). In addition, there was a significant main effect of the admin-avatar language on the familiarity with the admin-avatar ( $p < .05$ ). The mean test revealed that participants' familiarity with the admin-avatar/admin-avatar based on text in their own language was significantly lower than the admin-avatar/admin-avatar based on text in English. However, there was a non-significant main effect of the language used on the other constructs (clarity, control, convenience and anthropomorphism). A significant interaction effect was identified between the admin-avatar condition and the admin-avatar's language on the convenience construct ( $p < .05$ ), indicating that the admin-avatar condition (admin-avatar and admin-avatar based on text) was affected differently by the language used. Specifically, the convenience was higher in the admin-avatar based on text condition ( $M = 5.4674$ ) than the admin-avatar condition ( $M = 4.8248$ ) when English was used (as a second language). In contrast, the convenience was significantly higher in the admin-avatar condition ( $M = 5.2577$ ) than the admin-avatar based on text condition ( $M = 4.9823$ ) when the participant's own language was used. Most of these results do not support the qualitative results (some participants' comments), demonstrating that the constructs could differ according to the admin-avatar condition (based on text or not) and/or the admin-avatar's language. However, these results support the results the first experimental design. Specifically, there was no significant main effect of the admin-avatar condition on the clarity, control and convenience constructs. Therefore, it can be concluded that significant differences could appear between the admin-avatar or admin-avatar based on text condition

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and the written information. However, these significant differences might not appear between the admin-avatar and admin-avatar based on text conditions.

For the consequences related to the website, there was a significant main effect of the admin-avatar condition on the recall information ( $p < .1$ ). The mean test revealed that the recall information was significantly lower with the admin-avatar (regardless of language) than the admin-avatar based on text condition. In addition, there was a significant main effect of the admin-avatar condition on the attitude towards the website — in particular, the likeability construct ( $p < .1$ ). The mean test revealed that the attitude towards the website was significantly higher with the admin-avatar based on text condition (regardless of language) than the admin-avatar. However, no significant main effect emerged for the admin-avatar condition on the other constructs (hedonic characteristics, social presence, ease of using the website, usefulness, novelty and attractiveness). In addition, a significant main effect was found for the language used on the ease of using the website ( $p < .05$ ). The mean test revealed that the ease of using the website in the admin-avatar/admin-avatar based on text condition in users' own language was significantly higher than admin-avatar/admin-avatar based on text condition in English. However, there was a non-significant main effect of the language used on the remained constructs related to the website. There was no significant interaction effect between the admin-avatar condition and the language used on the constructs related to the website. Most of these results do not support the qualitative results (some participants' thoughts) which showed that the constructs could differ according to the admin-avatar condition (based on text or not) and/or the admin-avatar's language. However, these results support the results from the first experimental design. Specifically, no significant main effect of the admin-avatar condition occurred for the hedonic characteristics, ease of using the website, usefulness, novelty and attractiveness constructs. In addition, the differences in the attitude towards the website including the likeability between the admin-avatar conditions were not supported in both experimental design



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studies at  $p < .001$ . Therefore, it can be concluded that significant differences in the constructs could appear between the admin-avatar or admin-avatar based on text condition and the written information. However, these significant differences might not appear between the admin-avatar and admin-avatar based on text conditions.

For the consequences related to the brand, there was a significant main effect of the admin-avatar condition on the attitude towards brand construct ( $p < .05$ ). The mean test revealed that these constructs were significantly higher in the admin-avatar (regardless of language) than the admin-avatar based on text condition. In addition, there was a significant main effect of the admin-avatar condition on the recommendation construct ( $p < .05$ ). The mean test revealed that the recommendation was significantly higher with the admin-avatar based on text condition (regardless of language) than the admin-avatar condition. However, there was no significant main effect of the admin-avatar condition on the remaining constructs. Furthermore, there was no significant main effect of the language used on all consequences related to brand ( $p > .05$ ). There was a significant interaction effect between the admin-avatar condition and the admin-avatar's language on the word of mouth, recommendation and feedback constructs ( $p < .05$ ), indicating that the admin-avatar conditions (admin-avatar and admin-avatar based on text) were affected differently by the language used. Specifically, word of mouth was higher in the admin-avatar based on text condition ( $M = 4.8045$ ) than the admin-avatar ( $M = 4.2156$ ) condition when English was used as a second language. In contrast, word of mouth was significantly higher in the admin-avatar condition ( $M = 4.5722$ ) than the admin-avatar based on text condition ( $M = 4.5422$ ) when the participant's own language was used. With respect to recommendation, it was significantly higher in the admin-avatar based on text condition ( $M = 4.7962$ ) than the admin-avatar condition ( $M = 3.8258$ ) when English was used as a second language. In contrast, recommendation was slightly lower in the admin-avatar condition ( $M = 4.4864$ ) than the admin-avatar based on text condition ( $M = 4.5068$ ) when the participant's own language

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was used. Finally, giving feedback was significantly higher in the admin-avatar based on text condition ( $M = 4.0538$ ) than the admin-avatar condition ( $M = 3.6511$ ) when English was used as a second language. In contrast, it was significantly higher in the admin-avatar condition ( $M = 4.0609$ ) than the admin-avatar based on text condition ( $M = 3.8489$ ) when the participant's own language was used. Compared to the antecedents and consequences related to the website, many consequences related to the brand were affected by the admin-avatar condition, its language and/or the interactions between them. Therefore, it can be concluded that the website is highly affected by the addition of the admin-avatar and other features related to it.

Table 10.2 summarises the main results of the comparisons between the qualitative and both experimental studies results. The first column shows the comparisons based on only two conditions: admin-avatar and admin-avatar based on text conditions (the written information condition was only used in the first experimental study). The column shows the constructs emerged in the qualitative phase. The third and fourth columns show the results of both experimental studies. For instance, both experimental studies rejected the proposition that a difference existed between the two conditions (admin-avatar versus admin-avatar based on text) with respect to the control construct, even though it emerged in the qualitative phase results. The results of both experimental studies are consistent as there is no significant difference in most constructs with regard to the admin-avatar and admin-avatar based on text conditions. Therefore, the significant differences appeared in the first experimental study (i.e., between the admin-avatar or admin-avatar based on text and the written information).

Conditions	Qualitative phase (emerged constructs)	Experimental study one	Experimental study two
<b>Admin-avatar vs. admin-avatar based on text</b>	Control	Rejected	Rejected
	Convenience	Rejected	Rejected
	Communication	Supported	NA
	Competence	Rejected	NA
	Assistance	Rejected	NA
	Clarity	Rejected	Rejected
	Anthropomorphism	NA	Supported
	Familiarity	NA	Rejected
	Hedonic	Rejected	Rejected
	Social presence	NA	Rejected
	Usefulness	Rejected	Rejected
	Information recall	Rejected	Supported
	Ease of use website	Rejected	Rejected
	Attitude toward website	Rejected	Supported
	Attractiveness	Rejected	Rejected
	Novelty	Rejected	Rejected
	Likeability	Rejected	Supported
	Pride	Rejected	NA
	Attitude toward the brand	Rejected	Rejected
	Image	Rejected	Supported
	Modernity	Rejected	Supported
	Brand recall	Rejected	Supported
	Potential to join	Rejected	NA
	Propensity to leave	Rejected	NA
	WOM	NA	Rejected
	Recommendation	NA	Supported
Giving feedback	NA	Rejected	

**Table 10. 2 Comparisons between the experimental studies results in the light of the qualitative phase results and only with respect to the admin-avatar condition (based on text or not)**

The serial multiple mediator model was used to show the effect of each construct on the subsequent ones. The results showed the influence of each antecedent on word of mouth, recommendation and feedback mediated by the consequences related to the website and brand, as proposed in the second framework. Based on these results, the addition of the admin-avatar positively influences all three outcomes. The results support the qualitative results as a great number of the participants referred to saying positive words about the brand, recommending it to others and giving feedback to improve the admin-avatar in particular. In relation to the influence of antecedents on the hedonic characteristics, social presence, information recall and ease of using the website, some important points should be explored. First, the most highly influential antecedent on the hedonic characteristics and

social presence was anthropomorphism (1.00 and .67, respectively), whereas the least influential was convenience (.58 and .24). Second, the most highly influential antecedent on information recall was convenience (.68), whereas the least influential was clarity (.47). Third, the most highly influential antecedent on the ease of using the website is was clarity (.57), whereas the least influential were control and convenience (.28 and .27, respectively). Thus, both experimental studies showed that the clarity of the admin-avatar is the most highly influential dimension, which affecting the ease of using the website. In terms of the moderating role of familiarity, the results showed no significant interaction effect with any of the antecedents except in the case of the interaction between familiarity and convenience and the hedonic construct as the outcome.

#### **10.4 Chapter summary**

This chapter discussed the results of the systematic literature reviews. The results of the two experimental design studies, conducted in Chapters Eight and Nine, were also discussed in relation to the qualitative phase results and the literature. The most important outcomes from this chapter are the support for the new taxonomy of the admin-avatar concept as a base for the further examination of new frameworks. Specifically, most of the results from the two experimental studies conducted supported the assumptions of the causations and relationships between the admin-avatar dimensions, attitudinal consequences related to the website and brand and the behavioural consequences. Furthermore, the discussion provided valuable insights regarding these relationships, particularly for a new concept like the admin-avatar. The next and final chapter of this thesis will present the main theoretical and managerial contributions as well as limitations of the research and directions for future research.

## **Chapter Eleven: Conclusions**

### **11.1 Introduction**

Chapter Ten discussed the results of the systematic literature review, the qualitative results (from the interviews) and the quantitative results (from the experiments). It compared the qualitative results with similar results in the literature and the quantitative results with the qualitative results. This chapter aims to present the conclusions of this study. First, the theoretical contributions fulfilled in this research are stated. Next, the managerial and practical contributions are presented. Finally, the limitations of the research and future research directions are outlined. Figure 11.1 shows the Chapter Eleven map

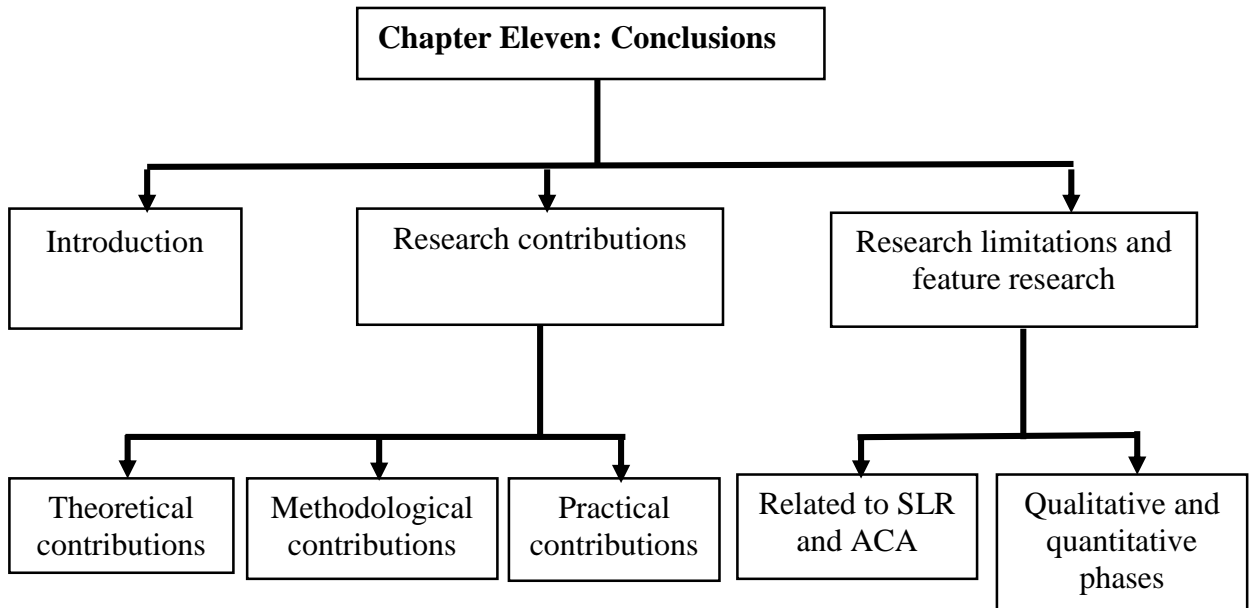
### **11.2 Research contributions**

This section discusses the contributions of the thesis. According to Corley and Gioia (2011), the contributions of research are determined through two main dimensions: originality and utility. The originality can be categorised into (1) advancing the understanding incrementally or (2) advancing understanding by providing some type of revelation. Meanwhile, utility is divided into (1) being practically useful, as the theory can be directly applied to practical problems, and (2) being scientifically useful, as the contribution is perceived as an advance in improving the conceptual rigour and/or enhancing its potential to be operationalised and tested. The next subsections show the extent which the contributions of the current study fall within the two dimensions (originality and utility).

#### ***11.2.1 Theoretical contributions***

According to the contribution matrix of Corley and Gioia (2011), shown in Figure 11.2, the current study offers original revelatory insights to brand literature by providing a new comprehensive definition for admin-avatar that shows its meaning, characteristics and roles

played on a website. To the best of author's knowledge, this research is the first to explore the admin-avatar concept comprehensively.



**Figure 11. 1 Chapter Eleven map**

Following the exploratory phase, the admin-avatar tower taxonomy was developed, showing how to build strong relationships between students/consumers and the brand by adapting new advanced technology such as the admin-avatar. The taxonomy shows the different stages, beginning with how to create a successful admin-avatar to increase the chance of consumers joining the brand and ending with demonstrating voluntary behaviours in favour of the brand. These stages are linked in the tower idea to give the message that, in order to reach the highest floors of the admin-avatar tower safely (i.e., consumers' behaviours), which are far from the foundation, the brand should build a strong base (successful admin-avatar) to develop the first floors (attitudinal consequences towards the brand website) and middle floors (attitudinal consequences towards the brand itself).

Originality	Revelatory	4	1
	Incremental	3	2
		Practically useful	Scientifically useful
Utility			

**Figure 11. 2 Current dimension for theoretical contribution (Corley & Gioia, 2011)**

This taxonomy can be considered as a first step for admin-avatar theory which further studies can empirically examine. In addition, future research could qualitatively and quantitatively investigate the admin-avatar concept in other contexts in order to reach the final boundaries or the frame of the theory. This research contributes to the literature conceptually by showing how to conduct business/administrative work using avatars and linking this back to websites and real-world brand workplaces. This contribution meets MacKenzie et al.'s (2013) call for research on conducting business using the avatars on websites and linking this with the world-companies — a theoretically noteworthy effort which has not yet been comparatively explored to identify implications for future business.

Based on Corley and Gioia's (2011) conceptualisation, the current study also offers original incremental insights. Unlike other constructs which emerged from the qualitative phase, this research conceptually contributes by identifying relatively new constructs — namely, control, accessibility and admin-avatar efficacy — as dimensions of the admin-avatar. These constructs

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pave the way for a better understanding of how to create a successful admin-avatar on the brand website. However, they still need more comprehensive investigations in order to develop and validate scales for them. Similarly, some relatively new constructs have been identified as consequences of using the admin-avatar — namely, information, brand recall and giving feedback; further investigations should develop and validate scales for these appropriate to the admin-avatar context. Building a strong theoretical background for admin-avatar use may solve the problems of relationship weaknesses between brand and consumers in the online context. This research also advances existing research on the admin-avatar concept in the marketing literature by providing a clearer picture of the admin-avatar construct, providing its dimensions and theoretical foundations of the concept. Therefore, according to Corley and Gioia's (2011) study, this research provides original incremental insights to existing research on the brand avatar, particularly the brand admin-avatar. Part of the conceptualisation is empirically confirmed through the experiments showing the influence of the admin-avatar dimensions on attitudinal and behavioural consequences. Thus, these findings advance the understanding of the theoretical foundations on the link between the new technology addition, represented by the admin-avatar, and brand–consumer relationships. Furthermore, in its two phases, this research identified two higher-order constructs: attitudes towards the website and attitudes towards brand. The qualitative data analysis showed the related data of attractiveness, novelty and likeability, reflecting the attitudes towards the website; the confirmatory factor analysis confirmed the higher-order construct of the attitudes towards the website. This gives a clear picture of the multidimensional nature of the attitude towards the website construct compared to the unidimensional measure used in the majority of previous studies. Moreover, this research produced knowledge to fill the gaps in the literature by examining the impact of the admin-avatar on consumers' behaviours (e.g., word of mouth, propensity to leave and giving feedback)



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mediated by the attitudinal consequences (e.g., hedonic characteristics, social presence and attitude towards the website and brand constructs).

Using Corley and Gioia's (2011) definitions, the current study also offers scientifically useful insights. The research presents its scientific usefulness by developing a comprehensive taxonomy of the admin-avatar guided by theories (e.g., reasoned action theory) and suitable for the brand context which will motivate scholars' future theory testing. The experimental studies in this research confirmed the influence of admin-avatar dimensions on the consumers' behaviours, such as the potential to join the brand through mediators, whether related to the website or the brand. Therefore, scholars — particularly those in the marketing field — can examine the constructs which emerged in the taxonomy and adapted scales (scales have been slightly changed to be appropriate for the admin-avatar) to gain a better understanding of the influence of admin-avatar dimensions and conditions on the attitudinal and behavioural consequences in the brand context. This research addressed the calls from marketing researchers (e.g., Keeling et al., 2010) to examine the effects of the avatar–consumer interaction as it is an important aspect of retail interactions which has thus far not been addressed. In addition, Suh et al. (2011) asserted that there is a need for a new theoretical approach to theorising how users' attitudes and intentions concerning avatars are influenced.

### ***11.2.2 Practical contributions***

This section outlines the main findings of this research with a focus on the lessons which should be learned when setting managerial plans. According to Corley and Gioia (2011), research has practical utility when it can be directly applied to the problems that executives, managers and/or other employees face. Given that building strong relationships with consumers is one of the key marketing priorities for most brands, practitioners receive benefits or values from the new knowledge of developing relationships based on the admin-avatar concept. For example, the

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current research offers practitioners a deeper understanding of the admin-avatar concept and its characteristics, roles and dimensions. A clear understanding of the admin-avatar concept helps practitioners establish effective plans for appropriately designing an admin-avatar for their websites. It enables them to identify the unique characteristics, such as including the main human characteristics clearly. For example, they should focus on accurately designing features related to speaking, human face and body, expressions and gender, among others, to persuade users to contact the admin-avatar as a real-life administrator. The admin-avatar voice should be clear and use normal intonation, without breaking during the speech. The shape of the admin-avatar's face and body should be normal. Designing these aspects properly gives users positive impressions and motivates them to contact the admin-avatar to get the required information or make inquiries. In developing the designs, practitioners should also be careful about the visual characteristics, such as nonverbal cues, animations and moving interface (not a static avatar). The movement of the mouth should match the speech. If there are differences between the mouth movements and the words spoken, users might believe that it is cartoonish and they might lose focus. In addition, the movement of the admin-avatar's face and body should be appropriate without any exaggeration to avoid distracting the users during the speech. Taking such these characteristics into consideration will help practitioners understand the philosophy behind creating the admin-avatar as a 'real-life imitation'.

The qualitative results supported by the quantitative results provide the main dimensions of the admin-avatar that can be compared to other styles and tools, such as written information and videos. These dimensions guide the practitioners and give them deeper insights of the main advantages of the admin-avatar that they should focus on and highlight for their users. For instance, the convenience of the admin-avatar (less effort) stems from getting the required information just by listening to it. The main aspects of the admin-avatar should be highlighted

in relation to its ease of use, such as clarity of voice, use of easy language to deliver the information, addition of some features (e.g., play, pause, rewind and forward buttons) to control the information flow. Such aspects also guide the managers in identifying the main defects of the admin-avatar and finding solutions for them. For example, one of the main problems of the admin-avatar, for some users, is that they cannot pick the required information up quickly. In this case, the practitioners should work on determining the means which help in getting the required information quickly. They can take the suggestions of the participants stated in the qualitative phase into consideration. Furthermore, the results give the practitioners more insights into the roles that the admin-avatar can play on the website, such as guidance, instructor and respondent to any inquiries. Practitioners should also be aware of the elements which make the admin-avatar more convenient than other tools based on these research results. Finally, the results of the admin-avatar research can help practitioners adopt strategies for effective communication, particularly with respect to the type of information and length of the messages. For example, the communication strategy should focus on ensuring that the messages the admin-avatar delivers are characterised as short and focused and include the most important information about topics. This strategy motivates the users to use the admin-avatar rather than, for example, reading the information, particularly detailed information.

After creating an effective admin-avatar through the four main dimensions (anthropomorphism, ease of use, admin-avatar efficacy and communication), it is valuable for practitioners to focus on the consequences identified in this research. Creating an admin-avatar on the brand website can lead to valuable consequences that practitioners and employees should consider when developing their plans. The consequences identified in this research show that the addition of an admin-avatar adds value to the brand website in terms of the website's ease of use, novelty, attractiveness and likeability. It is prudent to take initiatives that make the admin-avatar values

more appealing for target consumers. This research provides a better understanding of what an admin-avatar is and what its dimensions are, and practitioners can highlight in their marketing activities both the functional and hedonic aspects of the admin-avatar discussed herein.

The research also demonstrated that consumers prefer to deal with an informative admin-avatar, giving them all the required information they need. The brand should develop its admin-avatar continually to be described as informative in all topics it presents. This action needs the practitioners be continually aware of consumers' opinions with respect to the admin-avatar's messages and additional needs for required information. As many previous studies have shown, this research confirmed the link between an admin-avatar and the perceived social presence. This is a positive point for the brand as the online context suffers from social interactions. This means that the brand could remain near to its consumers even in the online context. The feeling of being close to the brand, particularly in the online context, could generate other feelings for the consumers, such as satisfaction with and confidence in the brand.

A live admin-avatar is an extremely useful tool that practitioners could incorporate into their websites. This is because developing such a tool will increase the probability of consumers using the admin-avatar as a tool on the websites compared to a programmed admin-avatar. Adding the live admin-avatar will help practitioners in meeting the specific users' needs quickly and more accurately. Providing immediate answers on any inquiries is a crucial advantage. The flexibility and accuracy of a live admin-avatar will encourage consumers to interact with brands (organisations). The interactions with a live admin-avatar is very similar to the face to face communications as it is conversational and synchronous. The addition of live admin-avatar will facilitate the administrative functions between consumers and brands (organisations) is quicker and much more efficient. It will help to foster positive perceptions in the users as they will perceive the live admin-avatar as a convenience oriented, hedonic, useful tool and will be

instrumental in enhancing their attitudes towards the brands' websites (e.g. attractiveness, novelty and likeability) and brand itself (e.g. positive image, respect). This, in turn, will increase the propabability of attracting new consumers to deal with or buy the brands' products. In additions, creating the live admin-avatar on the brand website might motivate the current consumers to carry out voluntary behaviours such as spreading positive words to others about the brand because of its new service (live admin-avatar). They also might recommend their friends to deal with the brands due to these innovative service features. While creating an advanced live admin-avatar is challenging task and demands the investment of a considerable amount of resources the rewards will accrue in terms of enhanced brand equity, more loyal consumer which may ultimately results in higher revenue streams for organisations.

Although the qualitative results showed that the admin-avatar is not a very critical aspect in changing the rank of the brand between its competitors, these results showed positive consequences towards the brand due to adding the admin-avatar. This is because the admin-avatar could be considered a competitive advantage for the brand due to, for example, its novelty and attractiveness. The practitioners should focus on the uniqueness of the admin-avatar compared to other tools in their marketing campaigns in order to attract new consumers and strengthen relationships with the existing one. In addition, as the results showed, the admin-avatar is a temporary competitive advantage as other competitors copy it; practitioners in the brand should take the initiative to advance their admin-avatar on an ongoing basis.

Admin-avatars can be useful for saving consumers' time at home or at work and improving decision quality or receiving answers appropriately. As an accelerating development in the Internet business, the use of decision aids such as admin-avatars has become increasingly essential because consumers usually prefer to receive updated information that helps them to make the right decisions. Therefore, it is important for the brands considering online marketing

strategies to highlight the potential advantages of the admin-avatars that help consumers make the right decisions, such as creating an admin-avatar ready to answers any inquiries from consumers. An admin-avatar can be uploaded to the brand website with answers to many frequently asked questions and the prompt to users to “just click on the question and listen to the answer through the admin-avatar”. Such messages will motivate consumers to do their business smoothly with the brands. From this perspective, the brands could use the admin-avatar to compete with others as are trying to implement effective technology to assist their consumers in making their decisions.

### **11.3 Limitations and future research**

As with any research of this nature, the current research has a number of limitations. These limitations are classified into two groups, showing possible directions for future research.

#### ***11.3.1 Limitations and future research related to SLR and ACA***

A number of limitations were identified in Chapter Two. First, the current research selected 10 databases covering most of the international peer-reviewed journals. Despite using this large number of databases, some journals might not be included in these databases. In other words, it is difficult to include all databases in one study. Therefore, future research could use other databases to capture other studies which have examined the avatar concept, such as Wiley, Springer LINK, Ingenta Connect and Palgrave Connect. Second, the researcher used different multivariate methods in the ACA analysis, and the results of the method confirmed each one (the results were consistent). Additional analysis methods could be used in future research to generate interesting findings. For example, the Pathfinder networks technique could be performed to show the networks between authors who contribute to the avatar research.

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*11.3.2 Limitations and future research related to the qualitative and quantitative phases*

This research represents a single perspective by presenting data from only one side: consumers (i.e., students). In describing a new feature added to a brand website, it is valuable to gather a complete picture about such an addition. In other words, other perspectives have not been taken into consideration with respect to the admin-avatar concepts, including those represented by the brand management/practitioners, administrators themselves and academic staff. Gathering additional perspectives would enrich our understanding of the admin-avatar concept and its dimensions and consequences. Future research could present multiple perspectives using data from more than one stakeholder.

The research was conducted in one university in the UK, which could raise concerns about the generalisability of the results. Ideally, collecting data from different universities from all over the UK could have reduced such sample selection bias. Although two experimental studies were conducted and confirmed most of the qualitative results, further investigations of the admin-avatar tower taxonomy are still warranted, whether with other universities or with industries such as banks, schools, and hospitals, to increase the external validity and generalisability of the findings. Furthermore, the current results cannot be generalised to all university students because not all universities throughout the world use the Internet heavily. Thus, the university segmentation matter offers a promising focus for further studies. In addition, it would be worth exploring and testing the admin-avatar based on consumer segmentation, such as heavy Internet users versus moderate or low Internet users. Further investigations could also be valuable if they assessed the extent to which the admin-avatar concept has been accepted and its effectiveness in different age markets (developed versus developing countries).

One of the limitations of the current research is that not all the constructs which emerged from the qualitative phase, as mentioned in Chapter Seven, were empirically examined due to time

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and cost constraints during the author's PhD programme. Further examinations are warranted to show the impact of the admin-avatar conditions and dimensions (particularly the live admin-avatar) on students' perceptions and behaviours. It could be more challenging for future studies to create a live admin-avatar to give the responses immediately because it will be more advanced than the ones used in the current research. However, such an approach would give more insights into the admin-avatar concept and its consequences. The cultural factors mentioned in the qualitative phase should also be deeply investigated to give more insights into using the admin-avatar and its consequences. Some previous studies have suggested examining the avatar in multicultural contexts (e.g., Ben Mimounn et al., 2012). Further investigations are needed to examine whether providing different accents for the admin-avatar affect users' perceptions and behaviours. Future research could also assess the influence of various admin-avatars on the brand website, such as a male versus female admin-avatar or more than one male or female admin-avatar, on users' perceptions and behaviours. In addition, future research could examine the influence of the admin-avatar's smile on users' perceptions. Using different characters of the avatar will help generalise the findings (Visschedijk et al., 2013). Future research is needed to explore and test the links between the admin-avatar's personality and users' personalities (admin-avatar and user congruence), their emotional reactions, intention to use the brand and their loyalty.

Limitations in the experimental studies included the fact that participants had to follow specific instructions to listen to the admin-avatar. Although it is important to prevent confounding variables from affecting the results, using specific instructions might force participants to hear information that they are not interested in hearing. Further studies could write general scenarios that enable the participant to choose topics of interest with the admin-avatar. In addition, using the convenience sample led to nearly 50% of the participants, particularly in the English admin-avatar conditions,



being native English speakers. In the data analysis, they were considered as being exposed to their own language conditions. This means that the number of participants in the admin-avatar with their own language conditions was greater than the number of participants in the second language condition. Further studies should focus on ensuring equality between conditions with respect to the number of participants. The admin-avatar used in this research included just the face and shoulders of the administrator; this might be a limitation because it might impact the admin-avatar's realism and users might believe it is not just a picture. Future research should compare the use of a full admin-avatar body to the use of the top half of an admin-avatar body to determine fits better in admin-avatar services, highlighting critical factors in the success of the avatar business.

The number of participants who participated in this study's experiments was not quite large because of the high cost of inviting participants to the computer lab for the experiments. Although using laboratory experiments offers many advantages, as explained in Chapter Five, the small number of participants might be a barrier to generalising the findings. Further studies could examine/replicate the frameworks used in this research using the laboratory or online experiments. An online experiment would be much cheaper and offer a higher probability of getting more participants for the experiment.

Finally, another issue to consider in future research is the impact of the admin-avatar on the user's perceived deception towards the brand. In other words, does adding an admin-avatar decrease the brand deception or not compared to the traditional version of the website or face-to-face interaction with the administrator? Future research could also develop models, as in the virtual world, for users to create their own avatars and start interacting with the brand admin-avatar. Such efforts would be important for identifying differences between users' attitudes and behaviours in genuine interactions with administrators and users' behaviours in virtual interactions in the virtual brand world.



**Conceptualisation and development of the admin-avatar  
taxonomy: Antecedents, attitudinal and behavioural  
consequences**

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## **Appendices**

## Appendix A

### Appendix A.1: Inclusion Criteria

No.	Criteria	Reason for inclusion
1.	Avatar as a topic not in the title	Capture all evidence of avatar in the selected disciplines
2.	Journal articles	Provide more valid and reliable information as they are peer reviewed. In other words, these can be considered as “certified knowledge” (Ramos-Rodriguez and Ruiz-Navarro 2004).
3.	<p>Selected fields/ sciences:</p> <p>A- Business (General Management, human resource management and employment studies, information management, innovation, international business and area studies, management development and education, business ethics and governance, operations research and management science, operations, technology and management, organization studies, public sector management, sector studies, strategic management and tourism and hospitality management.), marketing, psychology, social science and Economics.</p> <p>B- Computer science, communication and arts and humanities.</p>	<p>A- Ensure coverage the most related articles to marketing as the main field of the study. All citations ranked in ABS journal guide are included in the study.</p> <p>B- Compare the marketing articles of avatar with other sciences</p>
4.	Qualitative and quantitative studies	Capture all empirical evidence of avatar.

### Appendix A.2: Exclusion Criteria

No.	Criteria	Reason for Exclusion
1.	1993- 2013	This is because the first of the graphical Web browsers, which display a document as a page containing such elements as text, pictures, sound, movies and links to other documents or files became available in 1992 (Sotudeh-Gharebagh, 2003).
2.	Excluded fields/ sciences (e.g. medicine, chemistry.....etc).	Exclude many unrelated articles which are far to marketing field
3.	Agent	Similar concept but need to focus on the avatar phenomenon.

**Appendix A.3: The databases results**

No.	Search engine	No. of articles
1.	Web of science	356
2.	Emerald	57
3.	ProQuest	1191
4.	EBSCO	665
5.	Sage	184
6.	JSTOR	152
7.	IEEEExplore	275
8.	Scoups	39
9.	Science direct	338
10.	Taylor and Francis	848
<b>Total documents</b>		4105
<b>Find duplicates</b>		1776
<b>Total (after eliminating the duplicates)</b>		2361

**Appendix A.4: Further exclusion criteria**

Criteria	High relevant	less relevant	not relevant
<b>Frequency of mentioning the avatar word</b>	Four times or more in the main text of the article.	Less than four times in the main text of the article.	Mentioned only in the article references.
<b>The core of avatar concept</b>	As a character in the online context.	-----	Avatar movie. Avatar as religious word. Using avatar as general meaning (something not exist)

**Appendix A.5: Author lists per period**

	1993- 2006	2007- 2010	2011- 2012	2013
1.	Atkeson, C	Aggarwal, P	Arakji, R. Y	Aghajan Y,
2.	Badler N I.	Ariely, D	Axelsson,A.S	Angwin, J.
3.	Bowers J	Baylor, A.L	Bailenson, J.N.	Bailenson, J N
4.	Brown, D	Beatty S E	Baylor, A.L	Bailly, G
5.	Cassell, J	Bellman, S	Benbasat, I	Ben Mimoun MS
6.	Chi D M	Benbasat, I	Benford, S.D	Biocca F
7.	DeFanti T A.	Bickmore, T	Bickmore, T	Blinka L
8.	Ekman, P	Biocca, F	Biocca, F	Doyle , D.
9.	Friesen, W.V	Burgoon, J.K	Blascovich, J	Ducheneaut, N
10.	Guttman, R.,	Cassell, J	Carù, A	Elisei,F
11.	Hara,	Castronova E	Cassell, J.	Fox J
12.	Isbister, K	Cova B	Cova, B.	Garbarino EC
13.	Ishida, T	Dahan E	Daugherty, T	Gratch J,
14.	Lange, D.B.	de Rosis, F	Davis, A.B.	Hoorn JF
15.	Levenson, R.W	Englis B G.	Füller, J	Jin H-J
16.	Maes P	Farnham, S. D	Gilbert, Juan E	Jin SAA
17.	Moon, Y	Fogg, B.J	Gratch, J	Kafai YB

18.	Moukas, A.,	Garau, M	Greenhalgh, C.M	Kang S-H
19.	Nass, C I.	Gong, L	Häubl, G	Kim J
20.	Nishimura, T	Harris J.	Hemp, P	Kim Y
21.	Pawlicki, R.R.,	Haubl, G	Isbister, K	Konijn EA
22.	Reeves B	Herlocker, J. L	Jin, S.A.	Kozinets, RV
23.	Scassellati, B	Isbister, K	Joinson, A.N	Krämer NC
24.	Schaal, S	Janiszewski, C	Khazanchi, D	Lehdonvirta, V
25.	Schroeder, R	Jarmon, L	Kim, J.	Malter AJ
26.	Slater, M.	Johnson, E. J	Koschmider, A	Marshall, I
27.	Smith, J.	Kiesler, S	Kozinets V.R	Martin, J.-C
28.	Sproull, L	Komiak, S.Y.X	Lang, K. R	Merget D,
29.	Steur J S.	Konstan, J. A	Li, H	Merle A,
30.	Suler, J	Lam, S. K	Mennecke, B. E	Merola NA
31.	Takeda, H	Lee, E.-J	Merle, A	Miller H.
32.	Takeuchi, Y	Lee, K. M	Moon, Y	Nah, F.-H
33.	Taylor, T.L	Lee, K	Murphy, J.D	Nantel J
34.	Velasquez, J	Lester, J. C	Nakanishi, H	Nowak, K.L.
35.	Vilhjalmsson, H	Lynch, J. G	Nass, C I.	Peña J
36.	Yoshida, C	Maes, P	Owens, D.	Rauh C
37.	Zyda, M I	Mayer, R. E	Pitt, L	Schroeder R
38.		Moon, Y	Schroeder, R.	Senecal S
39.		Murray, K. B	Senecal, S.	Solomon, M R.
40.		Nass C I	Sherry Jr., J.F	St-Onge A
41.		Nelson, B. C	Snowdon, D.N	Suh K-S
42.		Nowak, K. L	Stone, B.A.,	Taylor TL
43.		Nunamaker, J.F	St-Onge, A	Tisseron S
44.		Pavlou, P.A	Tisseron, S.	Turkle, S.
45.		Punj, G	Wang, W	Ulusoy E
46.		Qiu, L	Wooldridge, M. J	Van Vugt HC
47.		Rauh, C	Yee, N	Vicdan H
48.		Reeves B	Zigurs, I.,	Williams, D
49.		Riedl, J		Wood, N T
50.		Sarwar, B.M		Yee, N.
51.		Sasse, M.A		
52.		Schafer, J. B		
53.		Sinha, R		
54.		Slater, M		
55.		Spiekermann, S		
56.		Sproull, L		
57.		Stone, B.A		
58.		Swearingen, K		
59.		Taylor T.L		
60.		Trevino L K		
61.		Vaidyanathan, R		
62.		Van Mulken, S		
63.		Walker, J.H		
64.		Walther, J. B		
65.		Wang, W		
66.		Waters, K		
67.		Webster, J		
68.		WILSON, J. R		

Appendix A.6: Co-citation matrix (period 1993-2006)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37				
Atkeson	1																																								
Badler	0	1																																							
Bowers	0	1	1																																						
Brown,	0	0	0	1																																					
Cassell,	1	0	0	0	3																																				
Chi	0	0	0	0	0	1																																			
DeFanti	0	0	0	1	0	0	1																																		
Ekman	1	0	0	0	1	0	0	2																																	
Friesen	0	0	0	0	0	0	0	1	1																																
Guttman,	0	0	0	0	0	0	0	0	0	1																															
Hara,	1	0	0	0	1	0	0	1	0	0	1																														
Isbister	0	0	0	0	0	0	0	0	0	0	0	1																													
Ishida,	0	0	0	0	0	0	0	0	0	0	0	1	1																												
Lange	0	0	0	0	0	0	0	0	0	1	0	0	0	1																											
Leven-son,	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1																										
Maes	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2																									
Moon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2																								
Moukas,	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1																							
Nass	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	3																						
Nishimura,	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1																					
Pawlicki,	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1																				
Reeves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1																			
Scassellati	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1																		
Schaal	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1																
Schroeder	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1														
Slater	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1													







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## Appendix B

### Appendix B.1. : The selected studies used in ACA (1993-2006)

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### **Appendix B.3: The selected studies used in ACA (2011-2012)**

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Lally, V., & Sclater, M. (2013). The Inter-Life project: researching the potential of art, design and virtual worlds as a vehicle for assisting young people with key life changes and transitions. *British Journal of Guidance & Counselling*, 41(3), 318-338. doi: 10.1080/03069885.2013.773582

Lee, M., Kim, M., & Peng, W. (2013). Consumer reviews: reviewer avatar facial expression and review valence. *Internet Research*, 23(2), 116-132. doi: 10.1108/10662241311313277

López-Ludeña, V., San-Segundo, R., González Morcillo, C., López, J. C., & Pardo Muñoz, J. M. (2013). Increasing adaptability of a speech into sign language translation system. *Expert Systems with Applications*, 40(4), 1312-1322. doi: <http://dx.doi.org/10.1016/j.eswa.2012.08.059>

MacKenzie, K., Buckby, S., & Irvine, H. (2013). Business research in virtual worlds: possibilities and practicalities. *Accounting Auditing & Accountability Journal*, 26(3), 352-373. doi: 10.1108/09513571311311856

Mennecke, B. E., & Peters, A. (2013). From avatars to mavatars: The role of marketing avatars and embodied representations in consumer profiling. *Business Horizons*, 56(3), 387-397. doi: 10.1016/j.bushor.2013.02.002

Michon, D., & El Antably, A. (2013). It's hard to be down when you're up: interpreting cultural heritage through alternative media. *International Journal of Heritage Studies*, 19(1), 16-40. doi: 10.1080/13527258.2011.633539

Schiller, S. Z., Goodrich, K., & Gupta, P. B. (2013). Let Them Play! Active Learning in a Virtual World. *Information Systems Management*, 30(1), 50-62. doi: 10.1080/10580530.2013.739891

Stevens, C. J., Gibert, G., Leung, Y. N., & Zhang, Z. Z. (2013). Evaluating a synthetic talking head using a dual task: Modality effects on speech understanding and cognitive load. *International Journal of Human-Computer Studies*, 71(4), 440-454. doi: 10.1016/j.ijhcs.2012.12.003

## Appendix C

### Appendix C.1: The databases results “agent”

No.	Search engine	No. of articles
1.	Web of science	178
2.	Emerald	57
3.	ProQuest	256
4.	EBSCO	142
5.	Sage	116
6.	JSTOR	5
7.	IEEE <i>Xplore</i>	441
8.	Scoups	105
9.	Science direct	429
10.	Taylor and Francis	129
<b>Total articles</b>		1858
<b>Find duplicates</b>		237
<b>Total (after eliminating the duplicates)</b>		1621

### Appendix C.2: Further exclusion criteria for agent search

Criteria	Highly relevant	less relevant	Not relevant
<b>Frequency of mentioning the selected terms or at least agent</b>	Four times or more in the main text of the article.	Less than four times in the main text of the article.	Mentioned only in the article references.
<b>The core of agent term</b>	As a character in the online context.	-----	Traditional agent or the agent as a human in the offline context.

### Appendix C.3: Articles classification according to the relevancy of objectives

Period	1993-2006			2007-2010			2011-2012			2013		
classification	HR	LR	NR	HR	LR	NR	HR	LR	NR	HR	LR	NR
<b>Number of articles</b>	88	94	307	46	28	111	34	18	57	11	4	18
<b>Total</b>	489			185			109			33		


HR: High relevant      LR: less relevant      NR: not relevant

## Appendix D

### Appendix D.1: Ethical approval form

Enrolled student 29/1/14  
2013/14

Appendix A


  
**UNIVERSITY OF Hull**

Business School

**A PROFORMA FOR  
STAFF AND STUDENTS BEGINNING A RESEARCH PROJECT**

This proforma should be completed by all staff and research students undertaking any research project and by taught students undertaking a research project as part of a taught module.

**Part A (compulsory)**

Research Proposer(s): Mohamed Hamed Safwat Zaky Elsharnouby

Student number (if applicable): 201112569

University of Hull email address: M.H.Elsharnouby@2011.hull.ac.uk

Programme of Study PhD (Marketing)

Research (Working Dissertation/Thesis) Title:  
Enhancing Customer-Brand Relationships through Spokes Avatars: Multi- perspective research

Research (brief): The impersonal nature of the websites has often been considered as a significant obstacle to online shopping. In recent years, in an attempt to mitigate these shortcomings, organisations have created 'avatars' which are virtual human images or characters which play a role during consumption episodes. The sense of humanity, which can be increased by spokes avatar, may have a significant impact on the customer relational constructs e.g. customer satisfaction and trust. There is a significant gap in the literature that, to the best of our knowledge, there has not been any empirical examination evaluates the impact of avatar, especially spokes avatar on other relational constructs such as relationship quality and strength mediated by perceived social presence.

Based on the literature, the purpose of this research is to examine the impact of spokes avatar on perceived social presence and relational constructs; relationship quality (satisfaction and trust) and relationship strength (participation and propensity to leave). The researcher, in this study, incorporates both theories; Trust-Commitment Theory and Social Presence Theory with the Technology Acceptance Model (TAM). This combination may help researcher to clarify and interpret the influence of spokes avatar on other constructs.

The used methodology in this research is a mixed methods approach. First, the researcher focuses on the interviews as a qualitative method to improve and support the research framework. Then, it is examined empirically by conducting fully factorial experimental designs. Both samples are students in the University of Hull (undergraduate/postgraduate)

Proforma Completion Date: 17-12-2013

Tick and sign by one of the following statements:

1) I confirm that *human participants are not involved in my research and in addition no other ethical considerations are envisaged.*

Signature of researcher.....

2) Human participants are involved in my research and/or there are other ethical considerations in my research.

Signature of researcher..... *Mohamed El-Sharnoby*

*If statement 1 is ticked and signed, there is no need to proceed further with this proforma, and research may proceed now.*

*If statement 2 is ticked and signed the researcher should complete part B of this proforma.*

**Part B**

*This proforma should be read in conjunction with the Ethical Principles for Researchers and the HUBS flow chart of research ethics procedures. It should be completed by the researchers. It should be sent on completion, together with a brief (maximum one page) summary of the issues/problems in the research (and how they are proposed to be dealt with), for approval to the Chair of the HUBS Research Ethics Committee (or nominated Committee member) or in the case of research being completed as part of a taught module to the student's supervisor or module leader prior to the beginning of any research.*

**NOTE**

If this research has a research population of those under 18 years of age it requires specific authorisation, including that from authorities outside the University. It should not proceed until such authorisation has been obtained in writing.

1. Will you obtain written informed consent from the participants? Y/N  
*If yes, please include a copy of the information letter requesting consent. In the case of electronic surveys it is acceptable to advise participants that completion of the survey constitutes consent. Please provide a printout of the survey template.  
 If no, the research should not proceed unless you can specifically satisfy the Research Ethics Committee with the measures you will take to deal with this matter.*
  
2. Has there been any withholding of disclosure of information regarding the research/teaching to the participants? Y/N  
*If yes, please describe the measures you have taken to deal with this.*
  
3. Issues for participants. Please answer the following and state how you will manage perceived risks if any answer is YES:
  - a) Do any aspects of the study pose a possible risk to participants' physical well-being (e.g. use of substances such as alcohol or extreme situations such as sleep deprivation)? YES NO
  
  - b) Are there any aspects of the study that participants might find humiliating, embarrassing, ego-threatening, in conflict with their values, or be otherwise emotionally upsetting? YES NO
  
  - c) Are there any aspects of the study that might threaten participants' privacy (e.g. questions of a very personal nature; observation of individuals in situations which are not obviously 'public')? YES NO
  
  - d) Does the study require access to confidential sources of

- information (e.g. medical records)? YES  NO
- e Could the intended participants for the study be expected to be more than usually emotionally vulnerable (e.g. medical patients, bereaved individuals)? YES  NO
- f Will the study take place in a setting other than the University campus or residential buildings? YES  NO
- g Will the intended participants of the study be individuals who are not members of the University community? YES  NO

\*Note: if the intended participants are of a different social, racial, cultural, age or sex group to the researcher(s) and there is **any** doubt about the possible impact of the planned procedures, then opinion should be sought from members of the relevant group.

4. Might conducting the study expose the researcher to any risks (e.g. collecting data in potentially dangerous environments)? Explain your method of dealing with this. YES  NO

5. Is the research being conducted on a group culturally different from the researcher/student/supervisors?  Y  N  
*If yes, are sensitivities and problems likely to arise?*  
*If yes, please describe how you have addressed/will address them.* Y/N?

6. Does the research conflict with any of the HUBS's research ethics principles?  Y  N  
*If YES do not proceed Describe for the Research Ethics Committee what action you have taken to address this?*

7. If the research requires the consent of any organisation, have you obtained it?  Y  N  
*If NO do not proceed Describe for the Research Ethics Committee what action you have taken to overcome this problem.*

8. Did you have to discuss the likelihood of ethical problems with this research with an informed colleague?  Y  N  
*If yes, please name the colleague and provide the date and results of the discussion.*

Thank you for completing this proforma. If you are a research student/member of staff this form must be signed by you, your supervisor/colleague and the HUBS Research Ethics Committee representative for your area. In the case of students undertaking research as part of a taught module, it must be signed by you and your supervisor or module leader. Once signed, staff and research students should send copies of this form, and the proposal must be sent to the Secretary of the Research Ethics Committee, Hull University Business School (see flow chart), including



where possible examples of letters describing the purposes and implications of the research, and any Consent Forms (see appendices).

Name of Researcher/Student ..... Mohamed Elshoraby  
Signature ..... Mohamed Elshoraby Date ..... 17/12/2013  
Name of Supervisor/Colleague/Module leader ..... Chanaka Jayawardhene  
Signature ..... Chanaka Jayawardhene Date ..... 17/12/2013

For proformas completed by staff and research students only:  
Name of Research Ethics Committee member ..... Stephan Dattu  
Signature ..... Stephan Dattu Date ..... 27. Jan 2014

For proformas relating to research funded by grants, please complete the following:

pFact no: .....  
RAR no: .....  
Funder/sponsor.....

## Appendix D.2: Informant consent form



Business School

**RESEARCH ETHICS COMMITTEE**  
**CONSENT FORM: Experimental design**

I, \_\_\_\_\_ of \_\_\_\_\_

**Hereby agree** to be a participant in this study to be undertaken by Mohamed Hamed Safwat Zakry Elsharnouby, and I understand that the purpose of the research is to examine empirically the influence of adding admin-avatar on the university website on the students attitudes and behaviours.

**I understand that**

1. The aims, methods, and anticipated benefits, and possible risks/hazards of the research study, have been explained to me.
2. I voluntarily and freely give my consent to my participation in such research study.
3. I understand that aggregated results will be used for research purposes and may be reported in scientific and academic journals.
4. Individual results will not be released to any person except at my request and on my authorisation.
5. I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

**Signature:**

**Date:**

The contact details of the researcher are: [M.H.Elsharnouby@2011.hull.ac.uk](mailto:M.H.Elsharnouby@2011.hull.ac.uk) ; 07539468703

The contact details of the secretary to the HUBS Research Ethics Committee are Amy Cowling Hull University Business School, University of Hull, Cottingham Road, Hull, HU6 7RX. Email: [a.cowling@hull.ac.uk](mailto:a.cowling@hull.ac.uk) tel. 01482-463410.

*In some cases, consent will need to be witnessed e.g. where the subject is blind/intellectually disabled. A witness must be independent of the project and may only sign a certification to the level of his/her involvement. A suggested format for witness certification is included with the sample consent forms. The form should also record the witnesses' signature, printed name and occupation. For particularly sensitive or exceptional research, further information can be obtained from the HUBS Research Ethics Committee Secretary, e.g., absence of parental consent, use of pseudonyms, etc)*

**NOTE:** In the event of a minor's consent, or person under legal liability, please complete the Research Ethics Committee's "Form of Consent on Behalf of a Minor or Dependent Person"

**Appendix D.3: Student sample characteristics “Interviews”**

<b>Round</b>	<b>Code</b>	<b>Pseudonym</b>	<b>Gender</b>	<b>Study program</b>	<b>Faculty/ Department</b>	<b>Nationality</b>
First round	STU 1	Tauseef	Male	PhD	Finance	Pakistani
	STU2	Cong	Male	PhD	Supply chain	Chinese
	STU3	Chao	Male	PhD	Engineering	Chinese
	STU 4	Samuel	Male	PhD	Media	Nigerian
	STU 5	Srin	Male	PhD	Finance	Indian
	STU 6	Ivan	Male	PhD	Finance	Bulgarian
	STU 7	Joseph	Male	PhD	Systems studies	Nigerian
	STU 8	Rahaf	Female	PhD	Systems studies	Omani
	STU 9	Naveed	Male	PhD	Supply Chain	Pakistani
	STU 10	Akmal	Male	Bachelor	Law	Malaysia
	STU 11	Olivia	Female	PhD	Systems studies	American
	STU 12	Bora	Female	Bachelor	Modern language	Albanian
	STU 13	Liang	Female	PhD	Marketing	Chinese
	STU 14	Malik	Male	Bachelor	Electronic engineering	Nigerian
	STU 15	Akeem	Male	MBA	Management	Nigerian
	STU 16	Ahmad	Male	Bachelor	English literature	Bruneian
	STU 17	Preecha	Male	PhD	Politics	Thai
	STU 18	Dara	Female	PhD	Supply chain	Thai
	STU 19	Moukhled	Male	MSc	Education	Saudi
	STU 20	Abdul-Aziz	Male	Bachelor	Engineering	Saudi
	STU 21	Mensah	Male	PhD	Economics	Ghanaian
	STU 22	Arun	Male	PhD	Systems studies	Indian
	STU 23	Delia	Female	PhD	Marketing	British
	STU 24	Carlos	Male	PhD	Management	Mexican
	STU 25	Shafiq	Male	PhD	Finance	Ghanaian

	STU 26	Alfredo	Male	PhD	Marketing	Mexican
	STU 27	Hong	Male	Bachelor	Accounting	Chinese
	STU28	Biming	Male	Bachelor	Business	Chinese
	STU29	Akwei	Male	MSc	Management	Ghanaian
	STU 30	Larkai	Male	MSc	Business	Ghanaian
Second round/	STU 31	Chris	Male	MSc	Business	English
	STU 32	Jamaan	Male	PhD	Accounting	Saudi
	STU 33	khulood	Female	PhD	Accounting	Omani
	STU 34	Zul	Male	PhD	Marketing	Indonesian
	STU 35	Shu	Female	PhD	Finance	Chinese
	STU 36	Hamdan	Male	Bachelor	Accounting	Saudi
	STU 37	Talha	Male	MSc	Business	Omani
	STU 38	Alyan	Male	MSc	Education	Saudi
	STU 39	Élise	Female	MSc	Financial management	French
	STU 40	Qadir	Male	Bachelor	accounting	Pakistani
	STU 41	Ralf	Male	Bachelor	Management	German
	STU 42	Matthew	Male	Bachelor	Biomedical	English

**Appendix E: Interview protocol**

**E.1 Exploratory interviews**

**Starting the interview**

In the beginning of the interviews the researcher introduces himself and states the aim of the interviews. “I’m Mohamed Elsharnouby a PhD student in marketing department. This interview is a part of my PhD thesis. I’m investigating the admin-avatar concept”.

The researcher shows the participants a current website “Sitepal company website” showing how the avatar works on the website. Thereafter, the researcher asks the participant to imagine the admin-avatar on the university website and answer on the following questions:

- Does admin-avatar differ from other media or styles videos or written information, in providing information to you? If yes, what are main differences?
- When you navigate a university website and find the admin-avatar tell you the required information, what do you feel?
- What are expected attitudes toward ....
  - Admin-avatar, and
  - The university as a brand?
- What are the expected behaviours you may behave toward the brand?
- To what extend do you believe that these university names are real or fake?

University name	Real name					Fake name			
	100%	75%	50%	25%	0%	25%	50%	75%	100%
Carlisle University									
University of Carlisle									
Ely University									
University of Ely									
Gloucester University									
University of Gloucester									
Hereford University									
University of Hereford									
Ripon University									

University of Ripon									
Salford University									
University of Salford-shire									
St Albans University									
The University of St Albans									
Truro University									
University of Truro									
Wakefield University									
University of Wakefield									
Wells University									
University of Wells									
St Davids University									
University of St Davids									
Inverness University									
The University of Inverness									

Based on the qualitative results of the exploratory interviews, the in-depth interviews were developed, as shown below.

## E.2 Semi- structured in-depth interviews

### Starting the interview

In the beginning of the interviews the research introduces himself and the aim of the interviews. “I’m Mohamed Elsharnouby a PhD student in marketing department. This interview is a part of my PhD thesis. I’m investigating the admin-avatar concept”.

In this interview, I do interview with student a postgraduate/ undergraduate student at University of Hull

Hello student (e.g. A)

The researcher displays the participants a current website “Sitepal company website” showing how the avatar works on the website. Thereafter, the research asks the participant to imagine the admin-avatar on the university website and answer on the following questions:

### *Admin-avatar concept*

- 1- Could you describe admin-avatar in as much detail?
- 2- Can you say what are the main characteristics of the admin- avatar?
- 3- Could you say something more about the extent of admin- avatar convenience as a communication tool?
- 4- Can you describe admin-avatar as a human character? Or, do you think admin- avatar looks like a human being? How?
- 5- Can you describe the ease/difficulty of using an admin- avatar as a communication tool? (Focus on clarity, controlling, effort, and understanding).
- 6- Could you describe the uniqueness/ novelty of an admin- avatar as a communication tool?
- 7- To what extent an admin-avatar is a useful tool to you?
- 8- Do you have any comments about the admin- avatar as a communication tool that provides the information to users?

### *Attitudinal constructs*

1. Could you describe your positive/ negative attitude toward the website in more detail:
  - The ease/ difficulty of using the admin- avatar?
  - The attractiveness of the website?
2. Could you describe your positive/ negative attitude toward admin- avatar in more detail: (focus on below points)

- Helpful tool/ healthy tool.
  - Informative tool.
  - Sufficient tool.
  - Exciting tool.
  - Efficient tool (relevance of the information).
3. Could you describe your satisfaction/ dissatisfaction in more details towards:
    - Admin- avatar.
    - Brand.
  4. Does having an admin- avatar make the brand more trustworthy?
  5. To what extent do you remember :
    - The information provided by using the admin- avatar?
    - The university as a brand by using admin- avatar?
  6. Do you feel proud to join/ respect the university because they use an admin- avatar? To what extent do you feel that you are dealing with a human being when you use admin- avatar? (Focus on awareness, understanding and response throughout communicating with admin-avatar).
  7. After using admin- avatar, could you describe your perception toward the University as a brand?

**Behavioural constructs**

1. Could you describe your behavioural intentions toward university after using admin- avatar?
2. Could you describe your likelihood of leaving university or its website after using admin- avatar?
3. Could you describe your participation/ giving advice to university after using admin- avatar?
4. Could you describe your likelihood to send feedback to university after using admin- avatar?
5. To what extent you will talk positively to your friends to join the university if an admin- avatar is added on to its website?
6. To what extent will you recommend the university to your friends if an admin- avatar is added on to its website?



**Language used**

1. Which language do you prefer to listen to the admin- avatar (English/ own language)?
2. Can you tell me your feelings toward an admin- avatar speaking in English/ own language?
3. Can you tell me your feelings toward the university after using English/ own language admin- avatar?
4. Can you tell me your potential behaviours toward the university after using English/ own language admin- avatar?

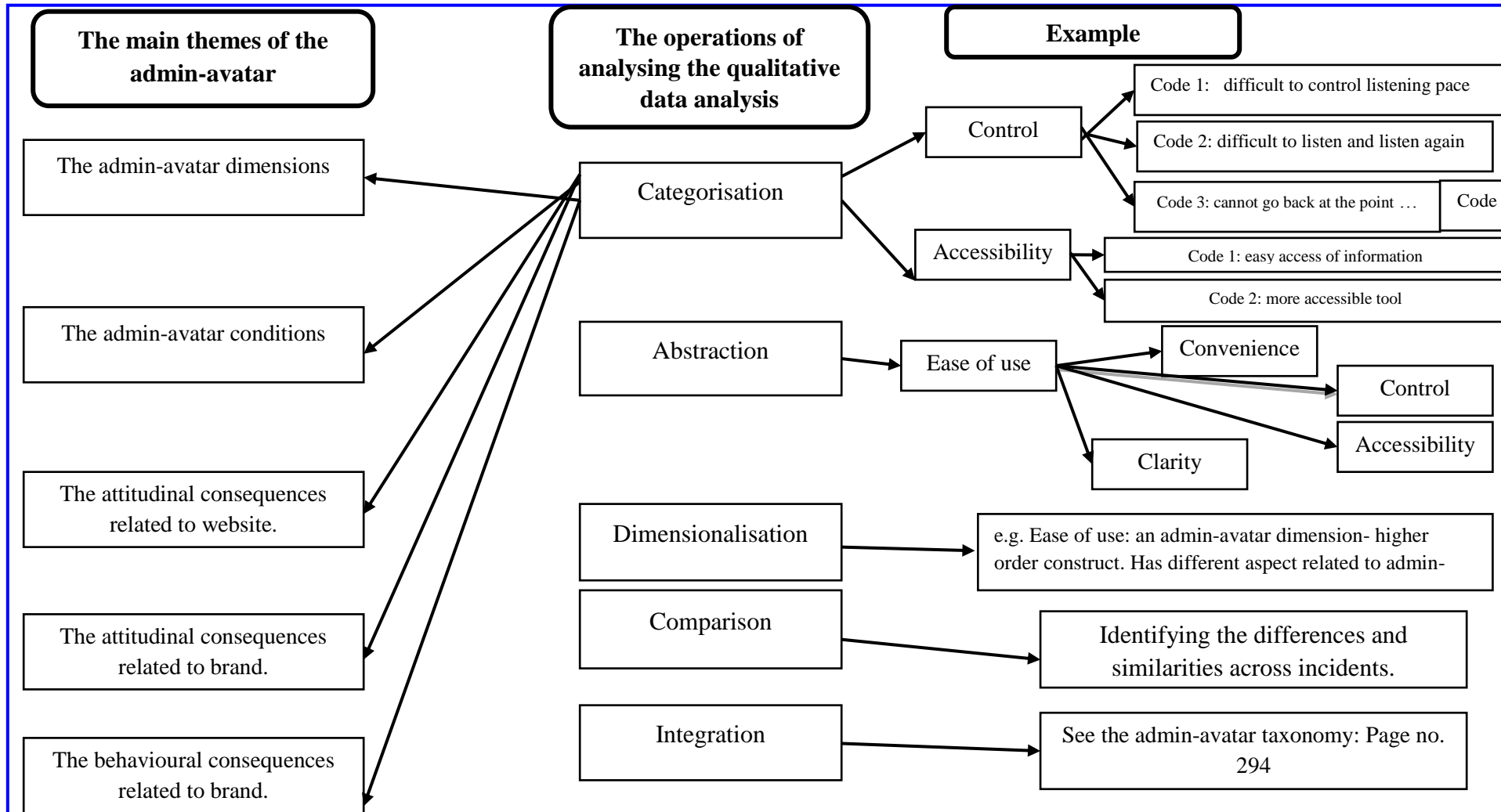
**Ending the interview**

Do you have anything more to add?

I have no further questions.

**Thank you for your cooperation**

E.3 The different operations used in the qualitative data analysis





## Appendix F

### Appendix F.1: Instructions sheet (Study one)

#### A) Admin-avatar

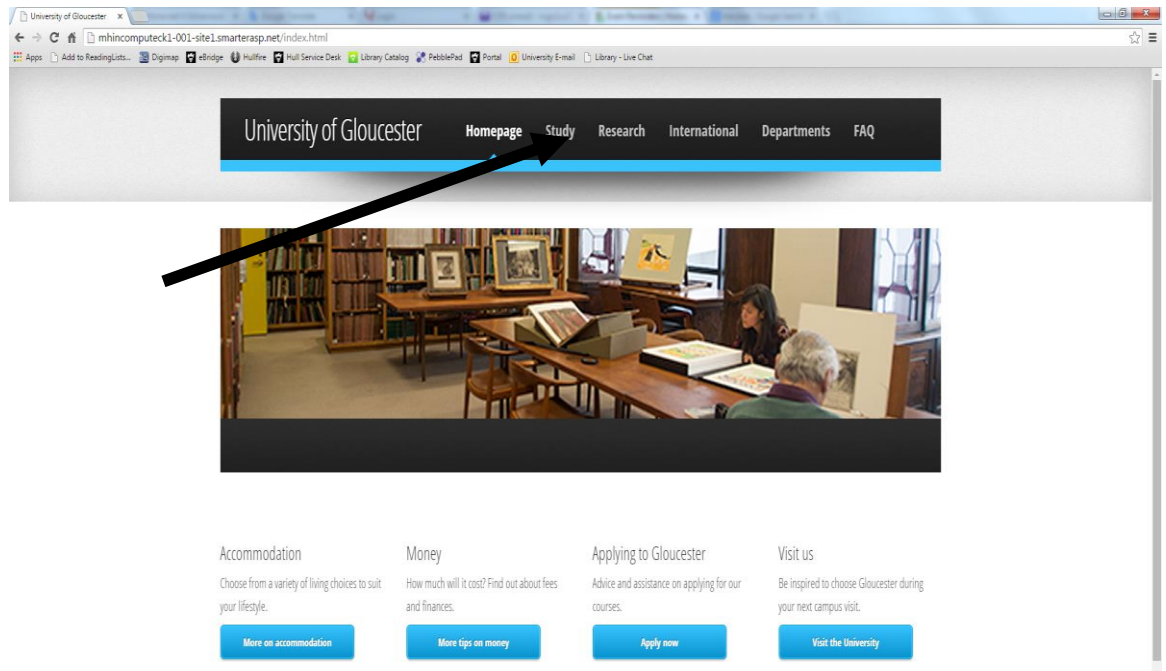
Dear participant,

Imagine that you are applying for (or is a current student at) University of Gloucester. When you browse its website, you will find **an admin-avatar** a feature on the website gives you information orally. To see this feature, **please follow these instructions:**

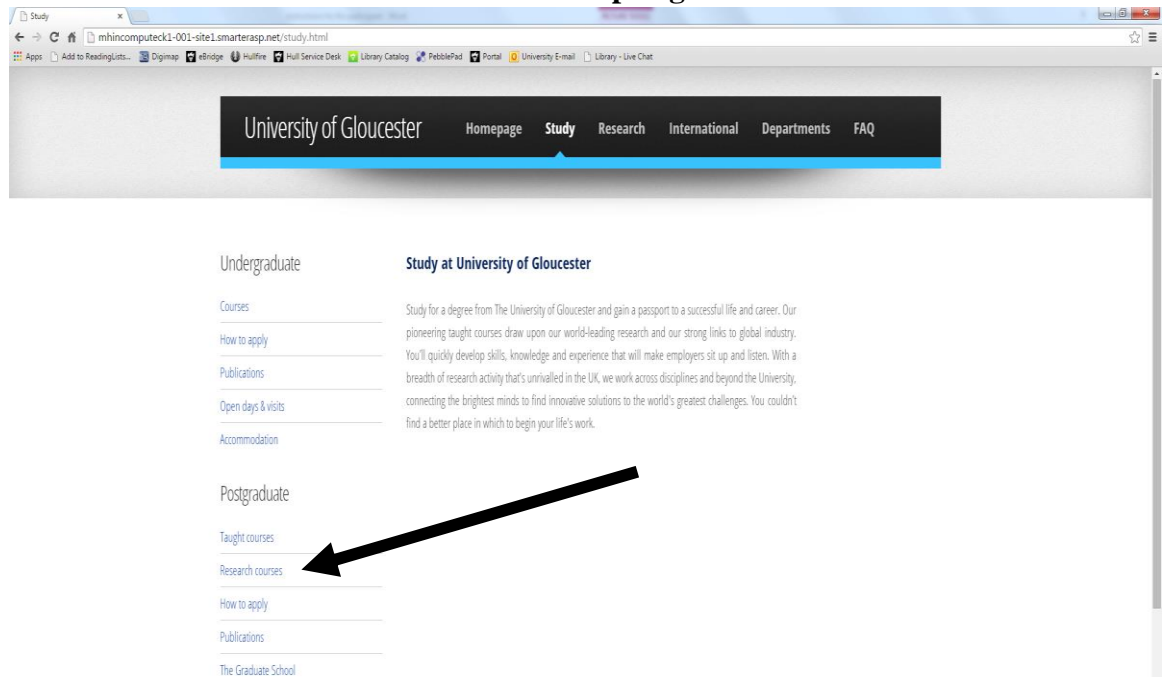
1. Click the current **Google Chrome** on the bottom bar of the desktop. You find the home page of the University of Gloucester.



2. Press on the "study" on the top bar of this page.

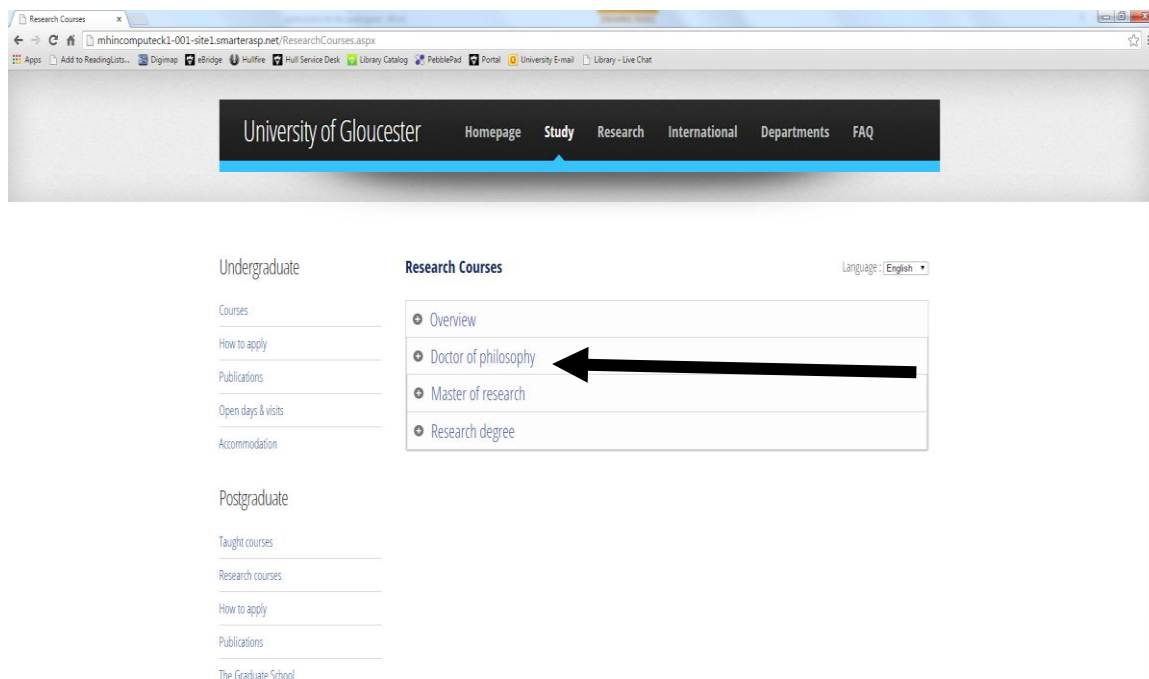


3. Select the "Research courses" underneath the **postgraduate** title.

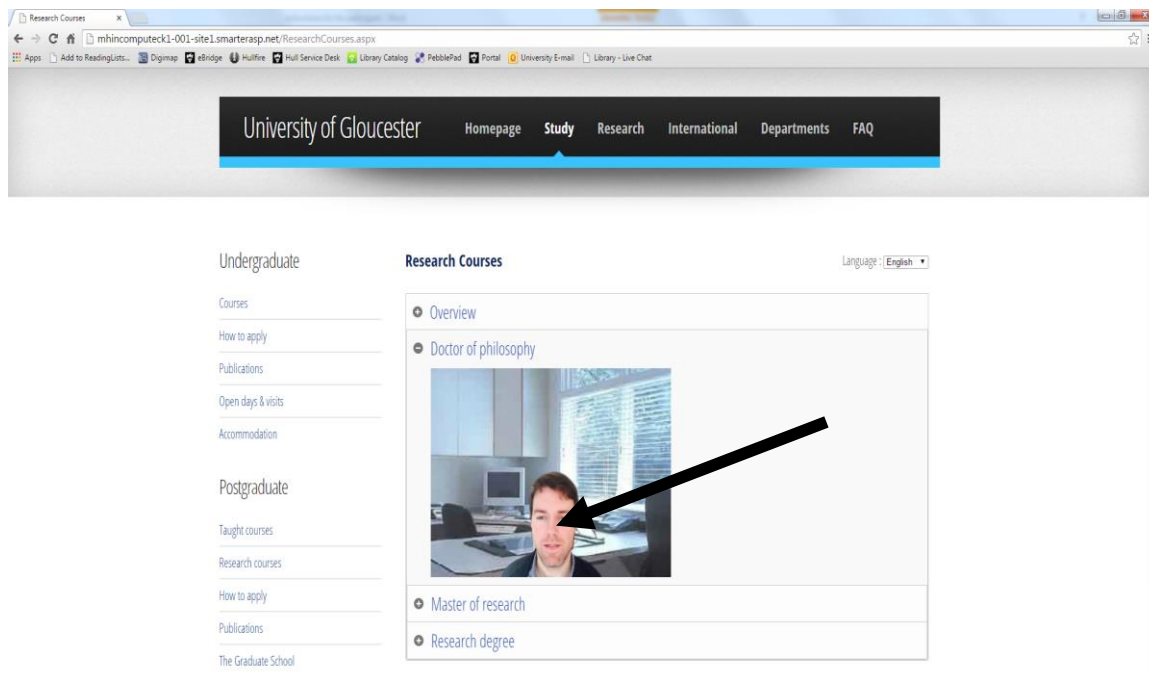


4. Use the "headset" to listen the information.

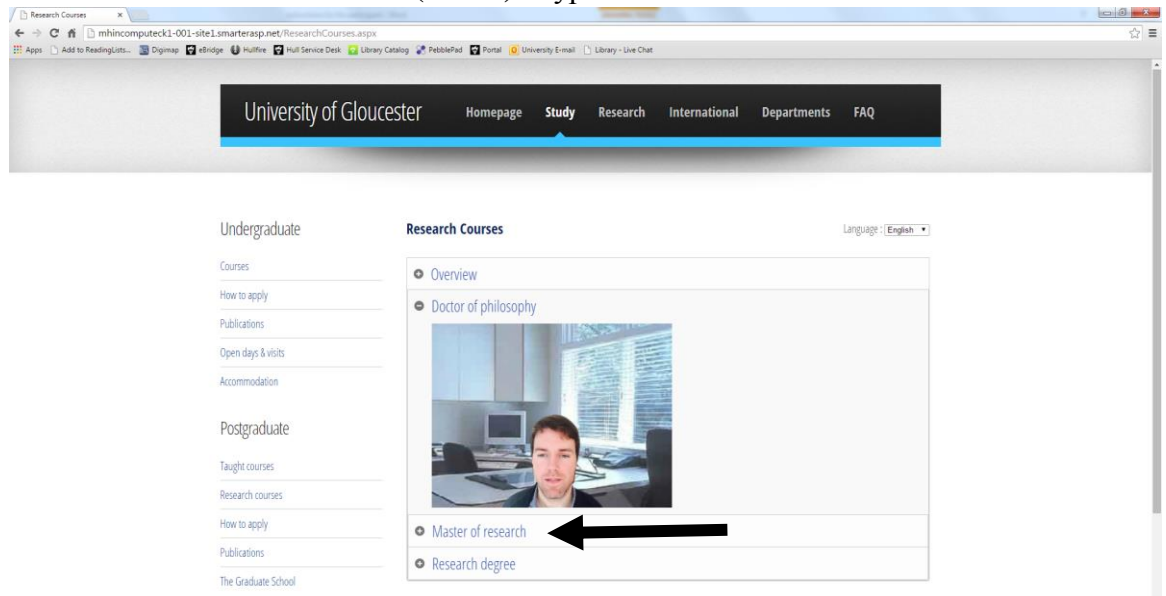
5. Press on “**Doctor of Philosophy and Master of Philosophy**” hyperlink.



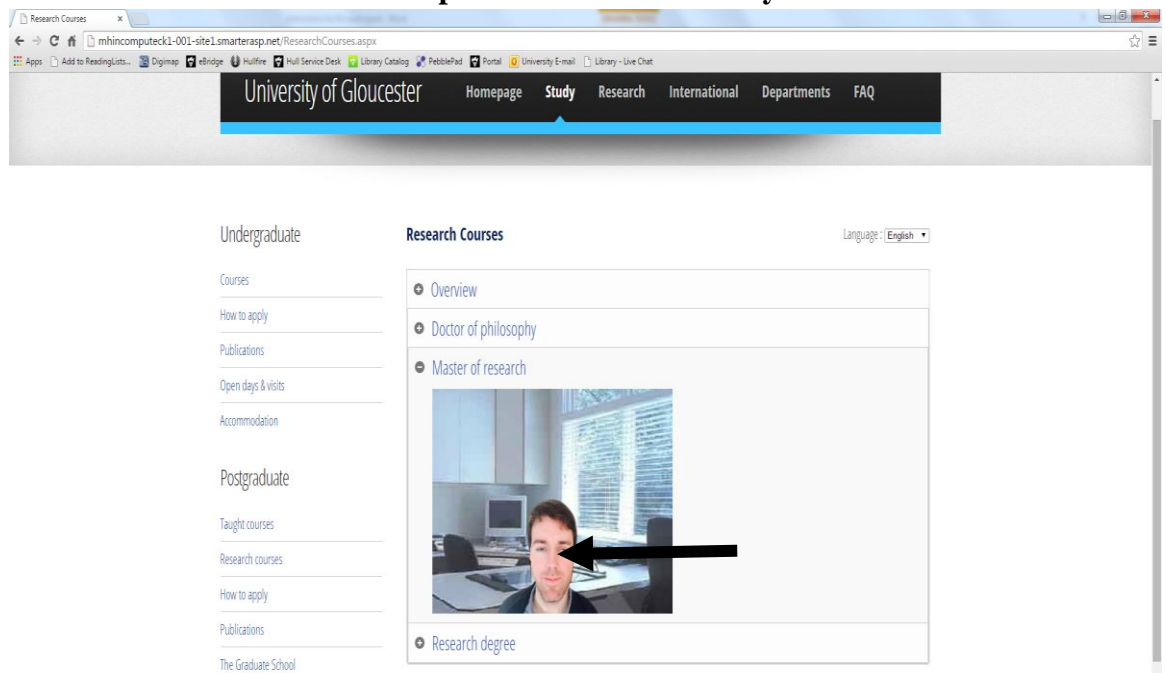
6. Place the mouse on **the face** and press and listen carefully.



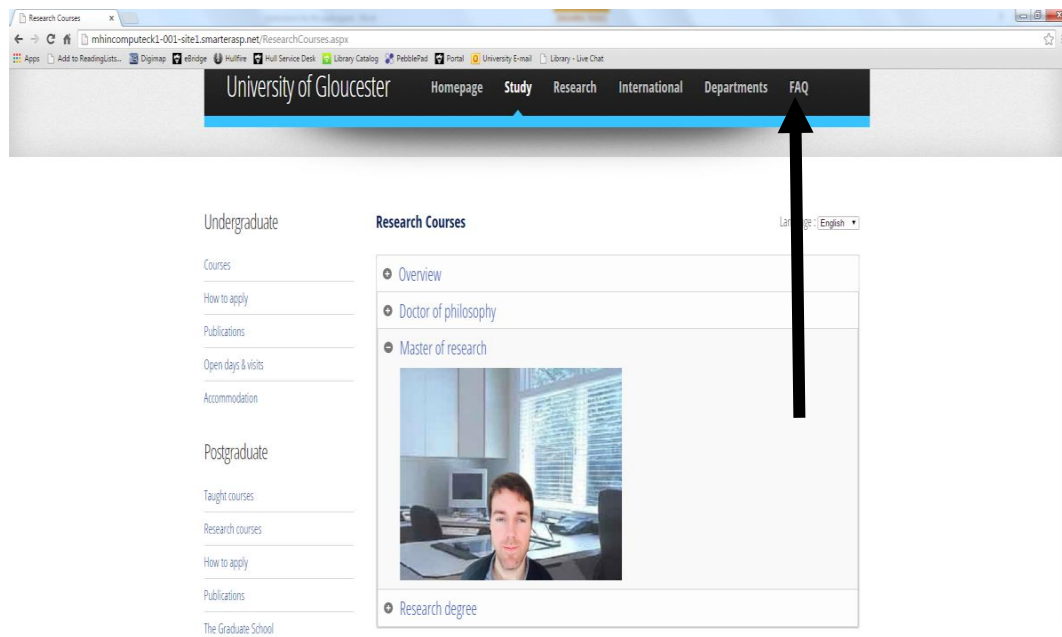
7. Press on “**Master of Research (MRes)**” hyperlink.



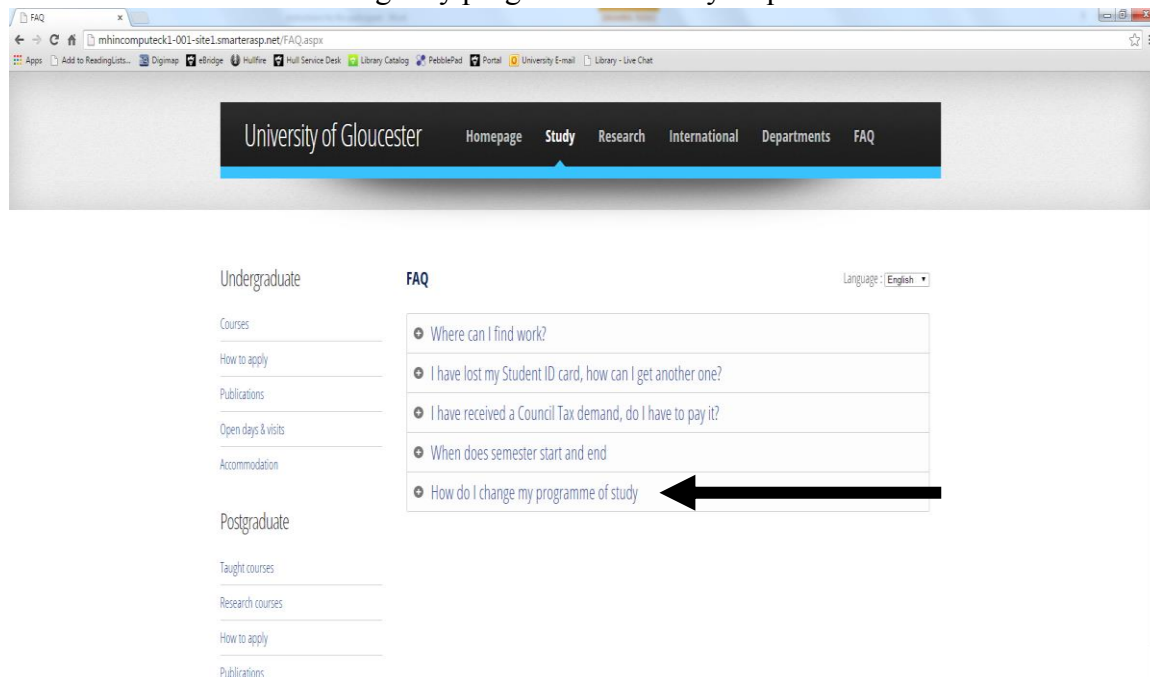
8. Place the mouse on **the face** and press and listen carefully.



9. Press on “FAQ” on the top bar.

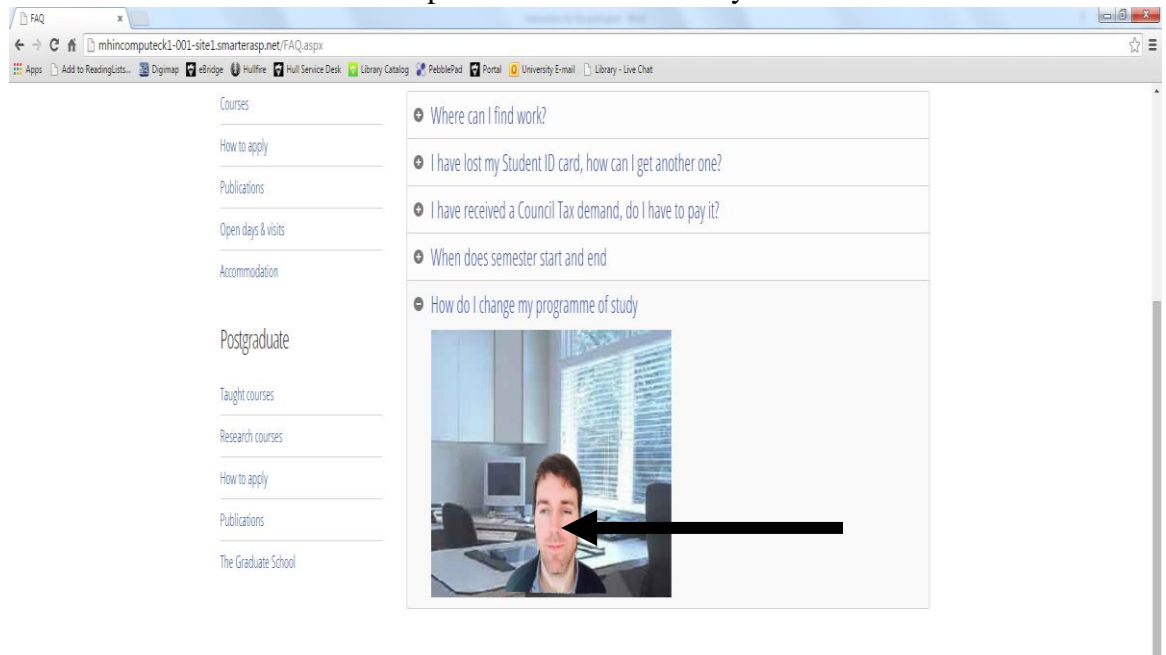


10. Press on the “How do I change my programme of study?” question.

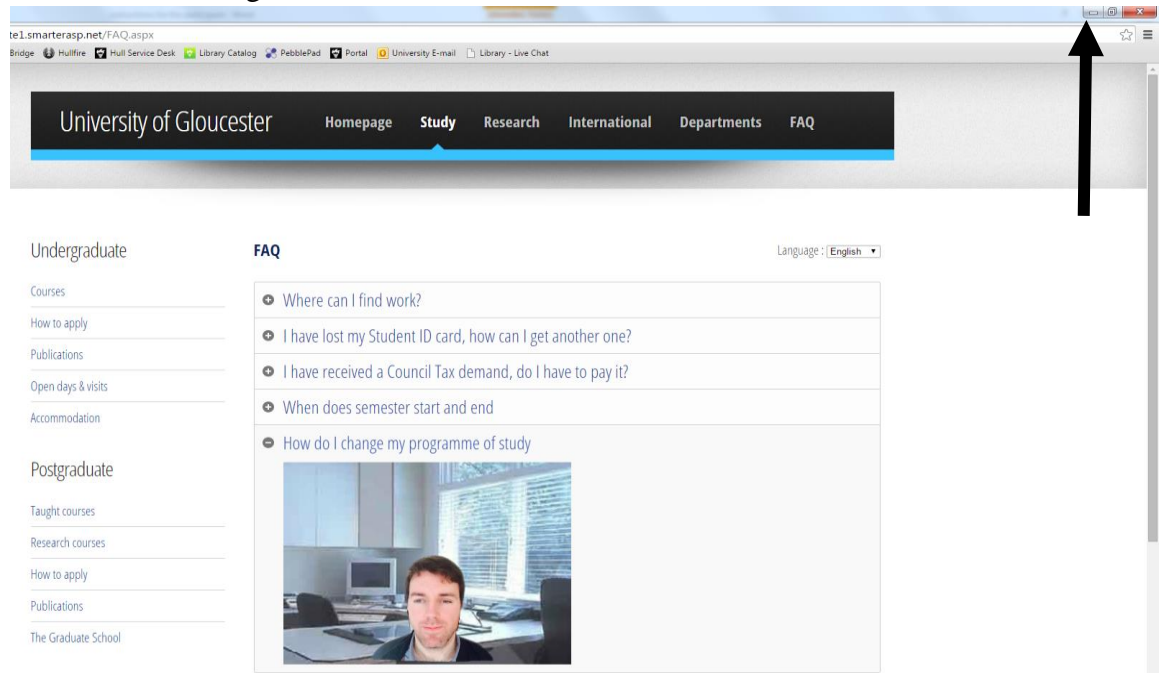




11. Place the mouse on the face and press and listen carefully.

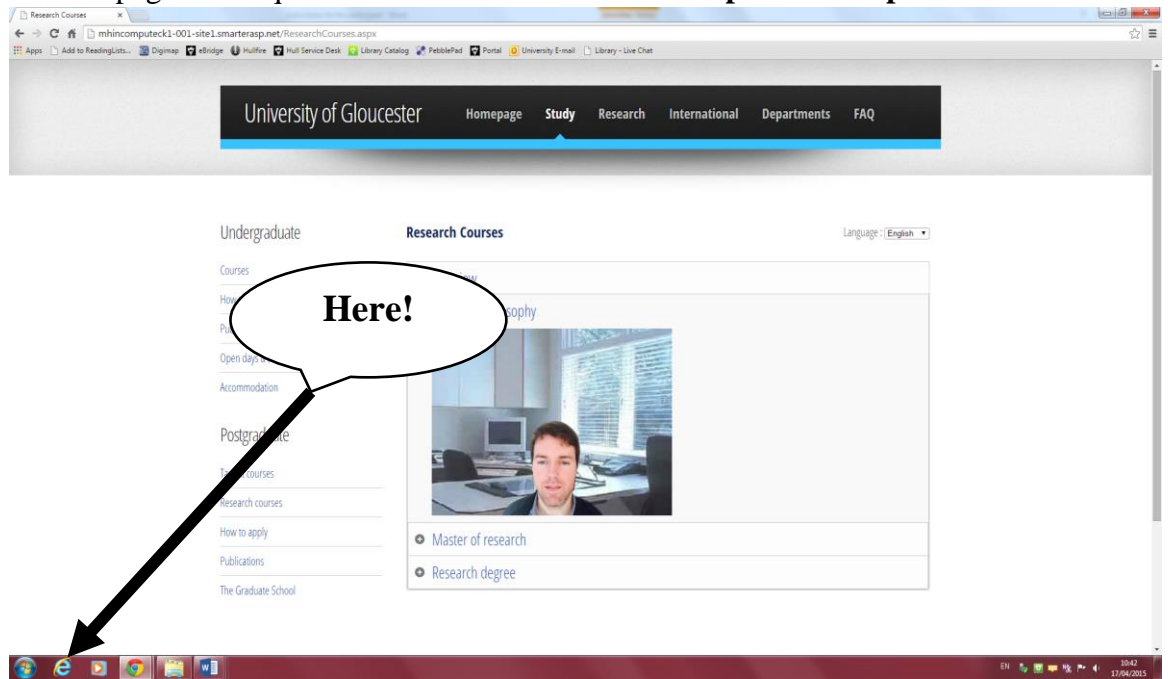


12. Minimize the Google chrome window.

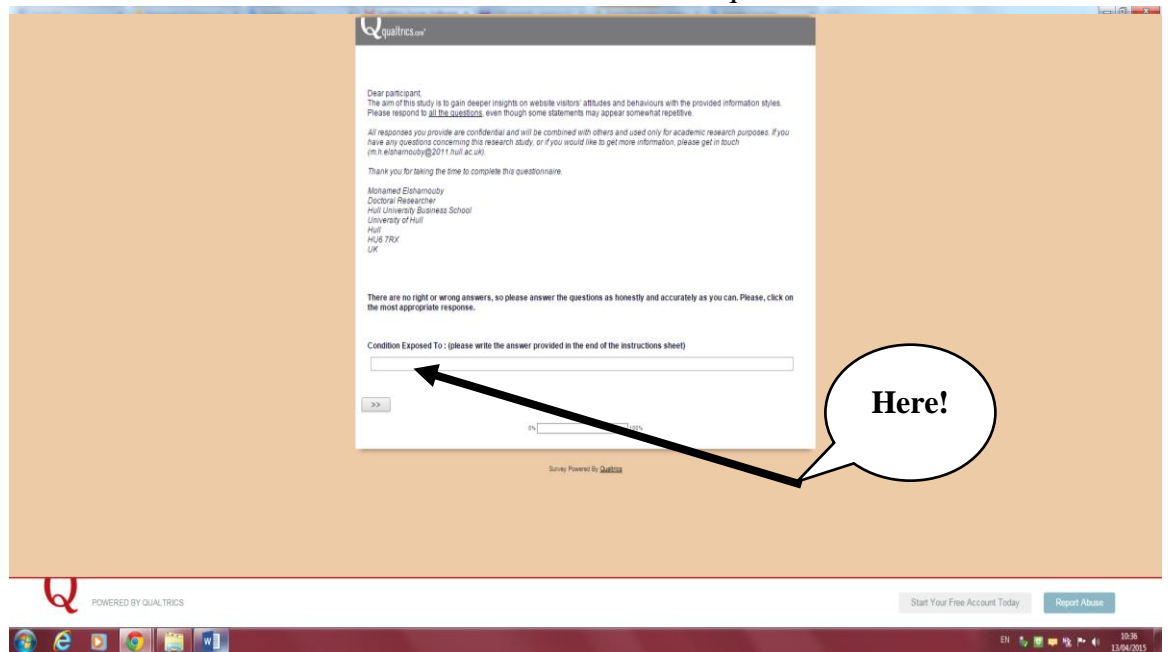


Now,

1. Click the current **internet explorer** on the bottom bar of the desktop. You will find the first page of the questionnaire. **Choose ONE of the provided copies.**



2. Please write “**admin-avatar**” as the answer of the first question.



3. Please, continue to answer on the next set of questions.

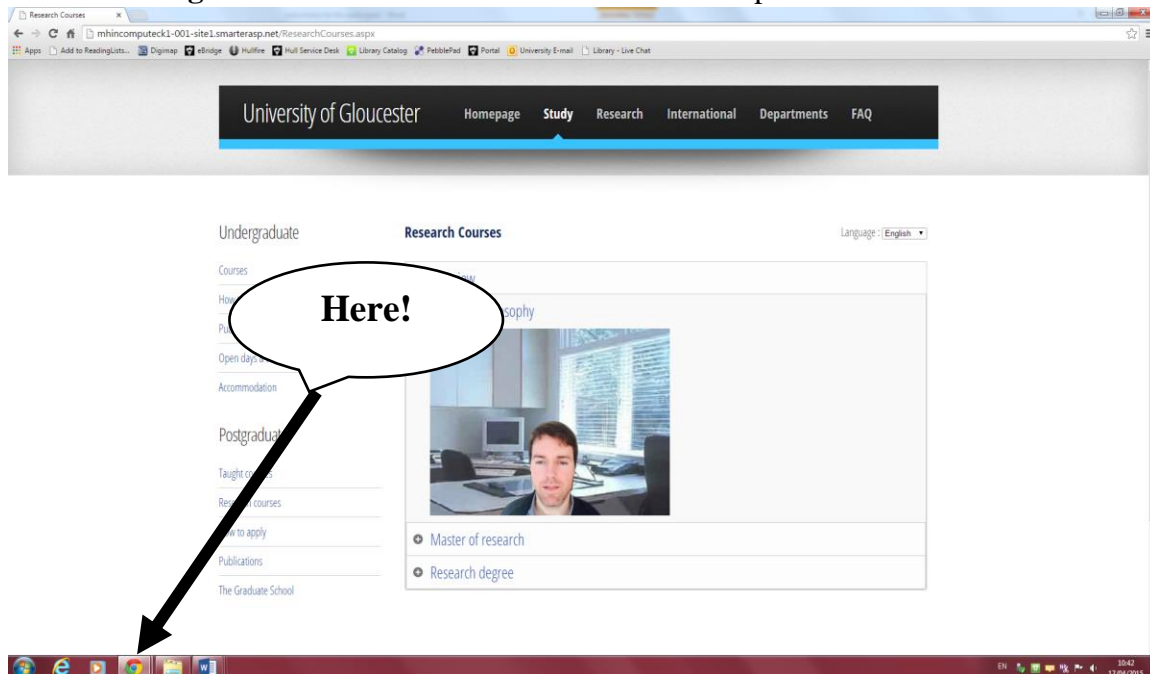
**Please have a rest for TWO MINUTES**

## B) Admin-avatar based on text

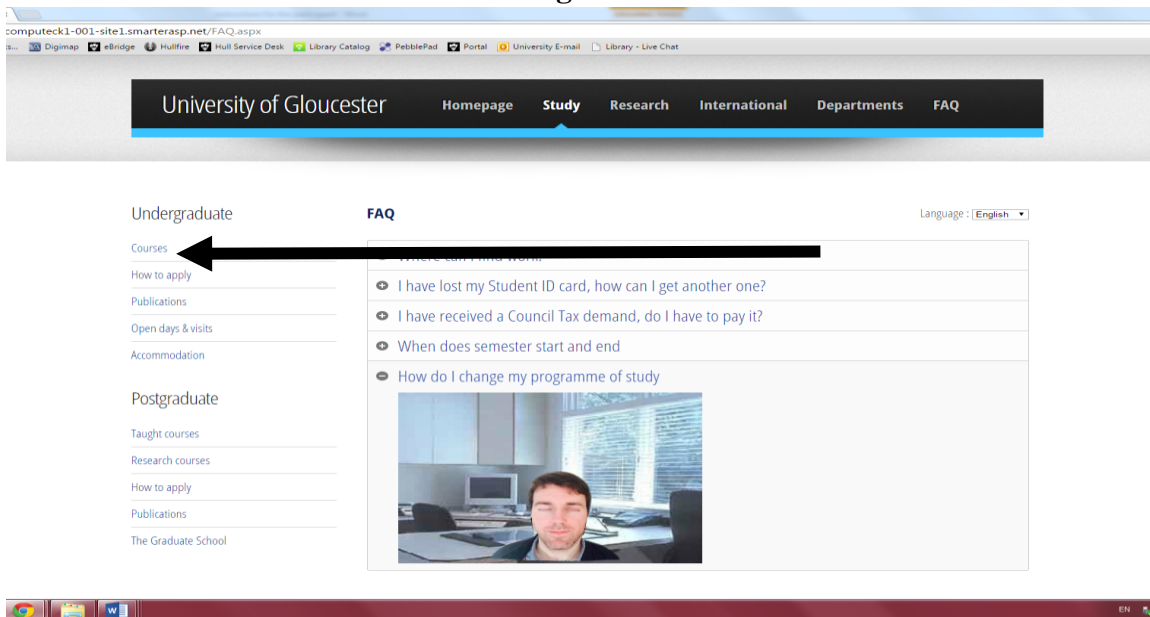
### Dear participant,

Now, imagine that you are applying for (or is a current student at) University of Gloucester. When you browse its website, you will find an **admin-avatar based on text**, a feature on the website gives you website information orally and you can also see the information while the admin-avatar is speaking. To see this feature, **please follow these instructions:**

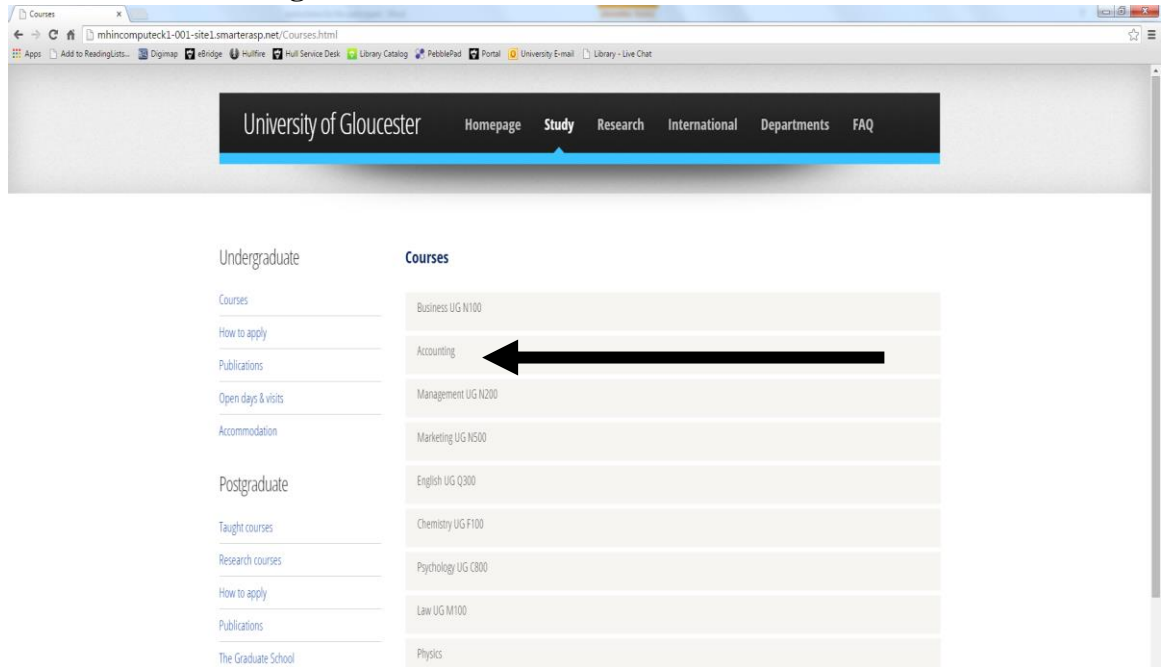
1. Click the **Google Chrome** on the bottom bar of the desktop.



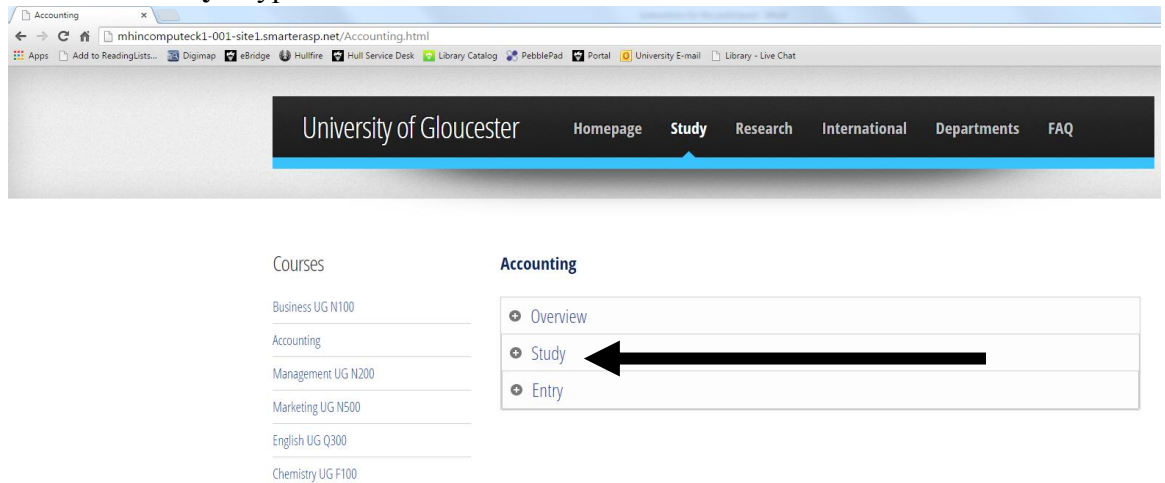
2. Select the “**courses**” underneath the **undergraduate** title.



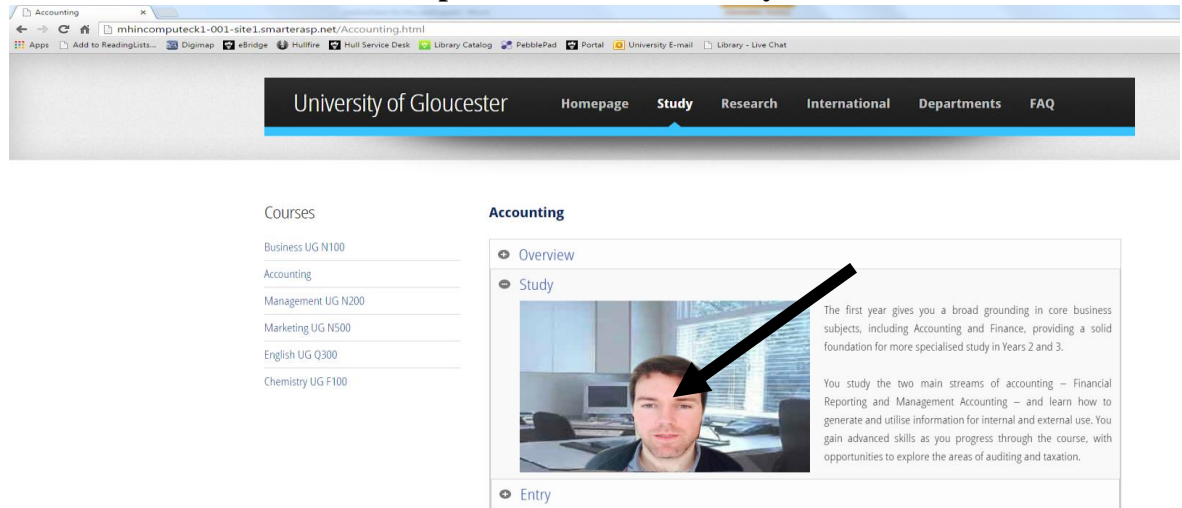
3. Use the “**headset**” to listen the information.
4. Select the “**accounting**” underneath the **Courses** title.



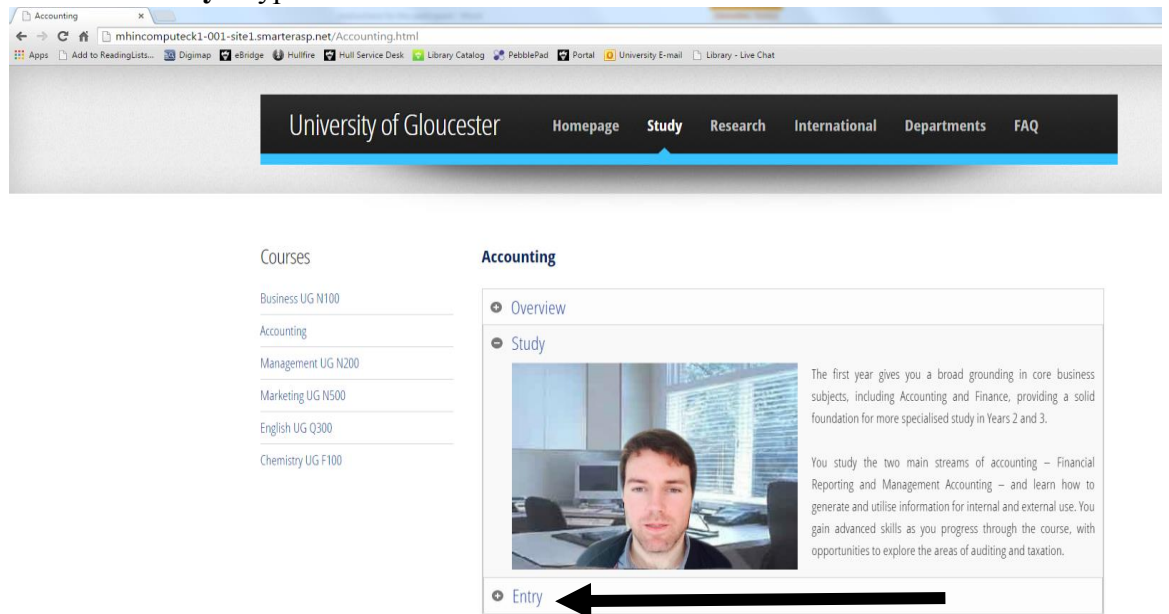
5. Press on “**Study**” hyperlink.



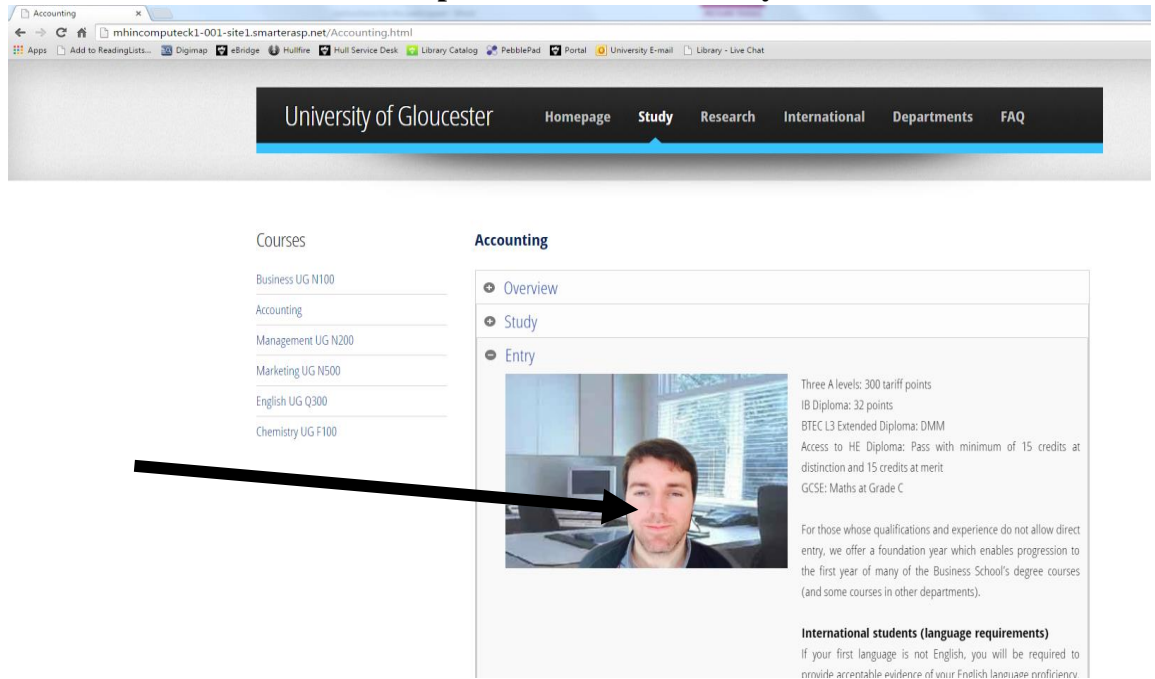
6. Place the mouse on **the face** and **press and listen carefully.**



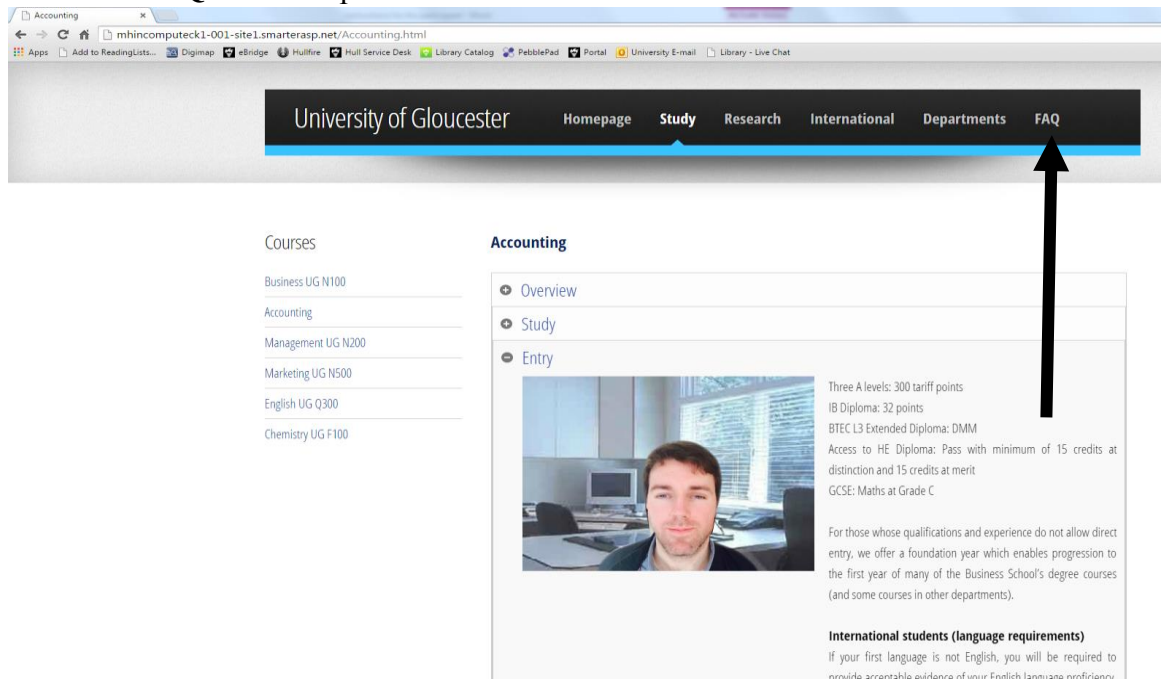
7. Press on **“Entry”** hyperlink.



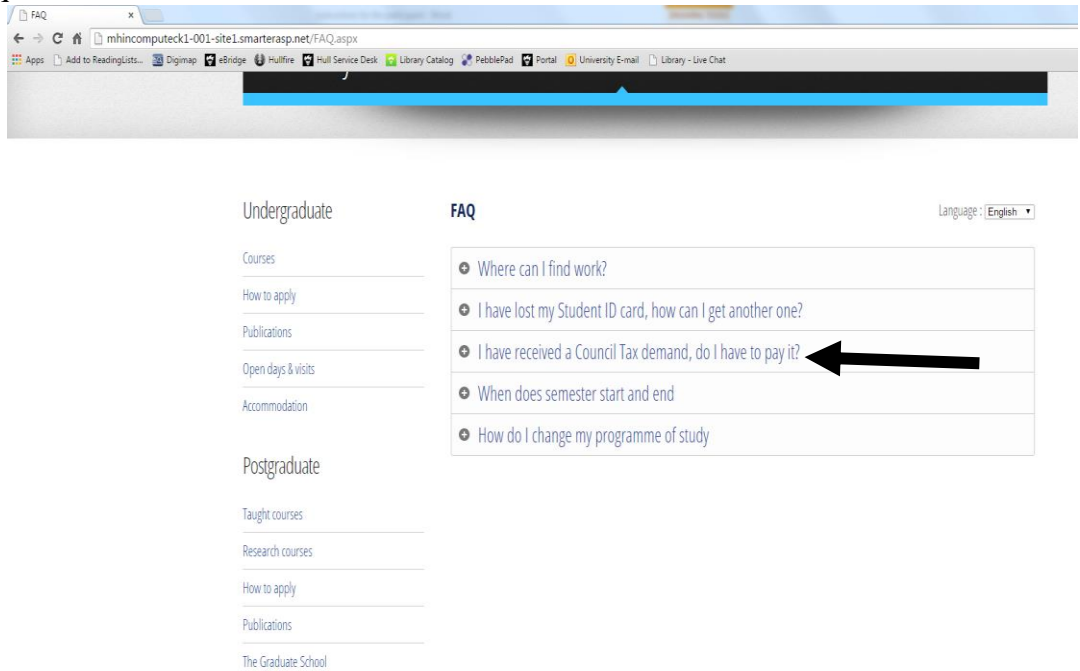
8. Place the mouse on the face and press and listen carefully.



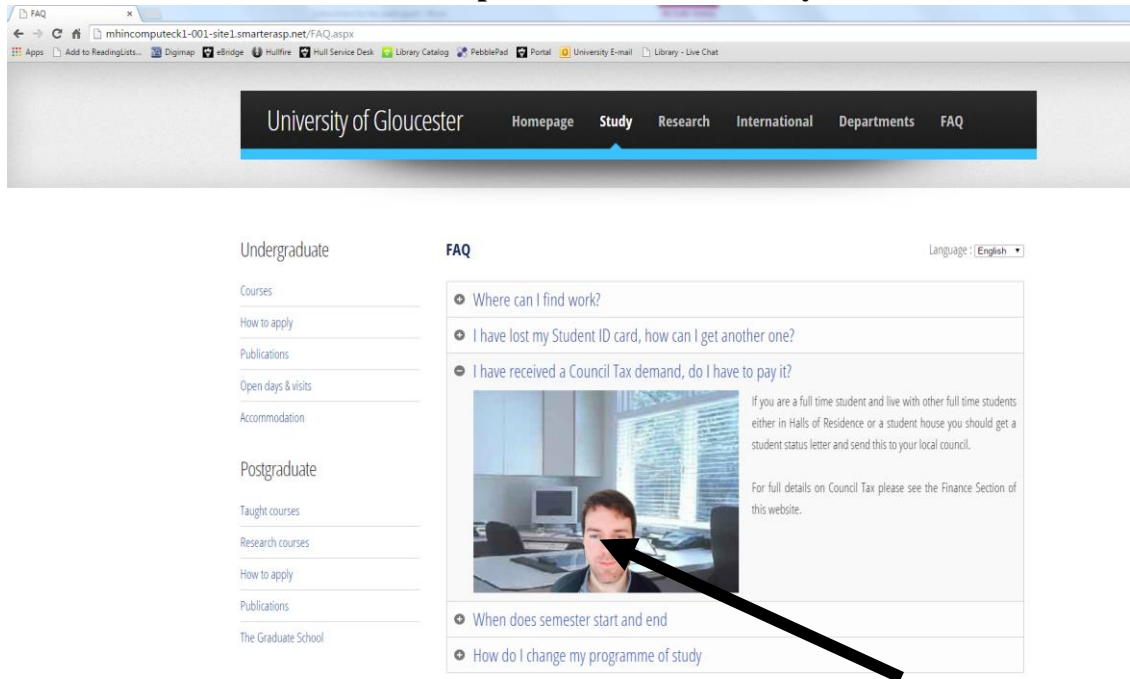
9. Press on “FAQ” on the top bar.



10. Press on the “I have received a Council Tax demand, do I have to pay it?” question.

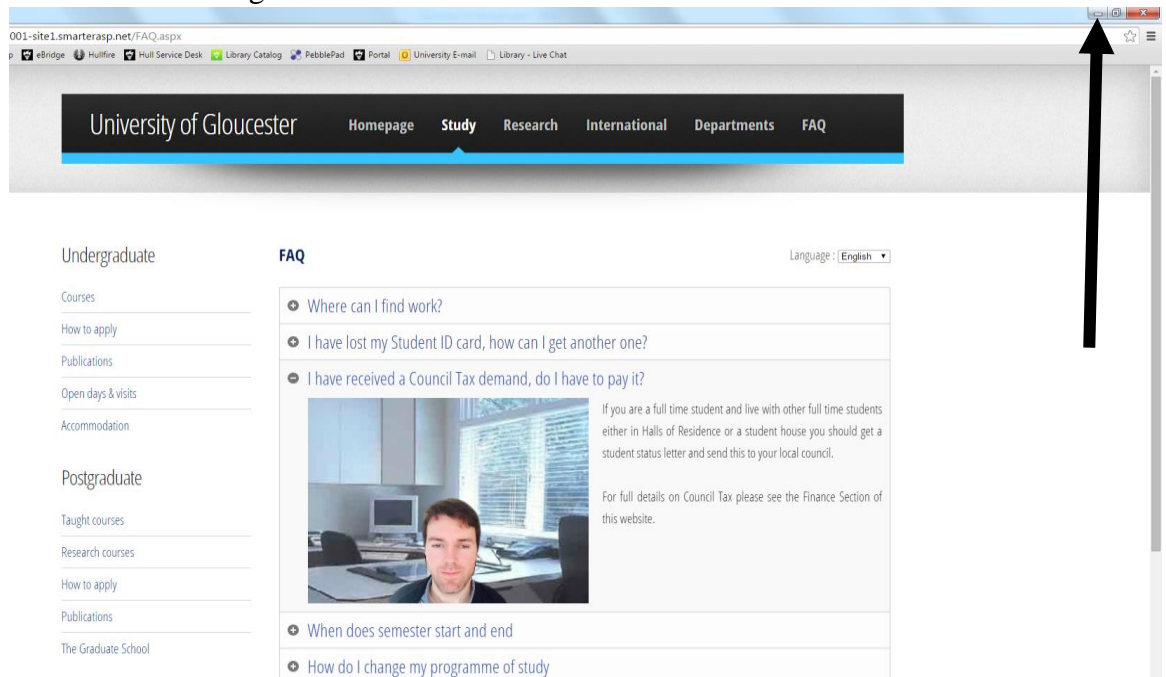


11. Place the mouse on the face and press and listen carefully.





12. Minimize the Google chrome window.

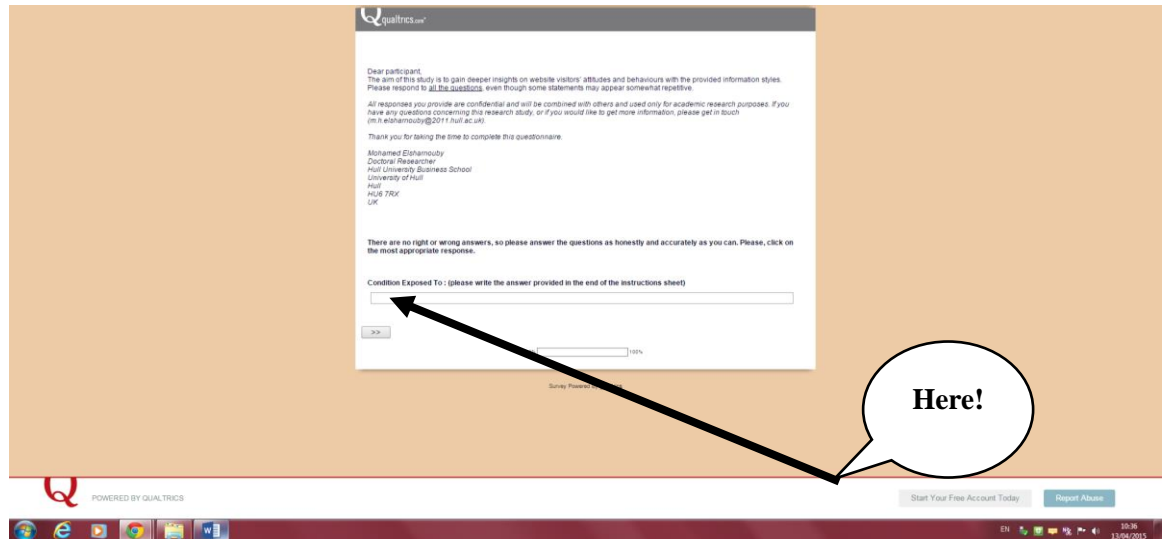


Now,

1. Click the **internet explorer** on the bottom bar of the disk top. You will find the first page of the questionnaire. **Choose ONE of the provided copies.**



2. Please write **admin-avatar based on text** as the answer of the first question.



3. Please continue to answer the next set of questions.

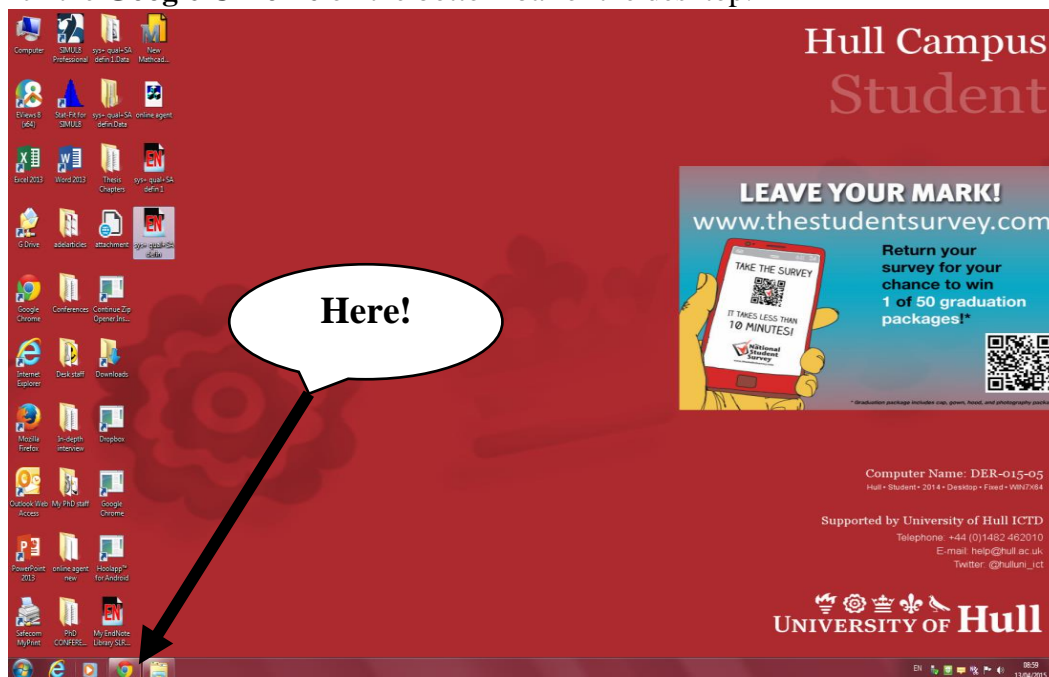
**Please have a rest for TWO MINUTES**

### C) Written information style

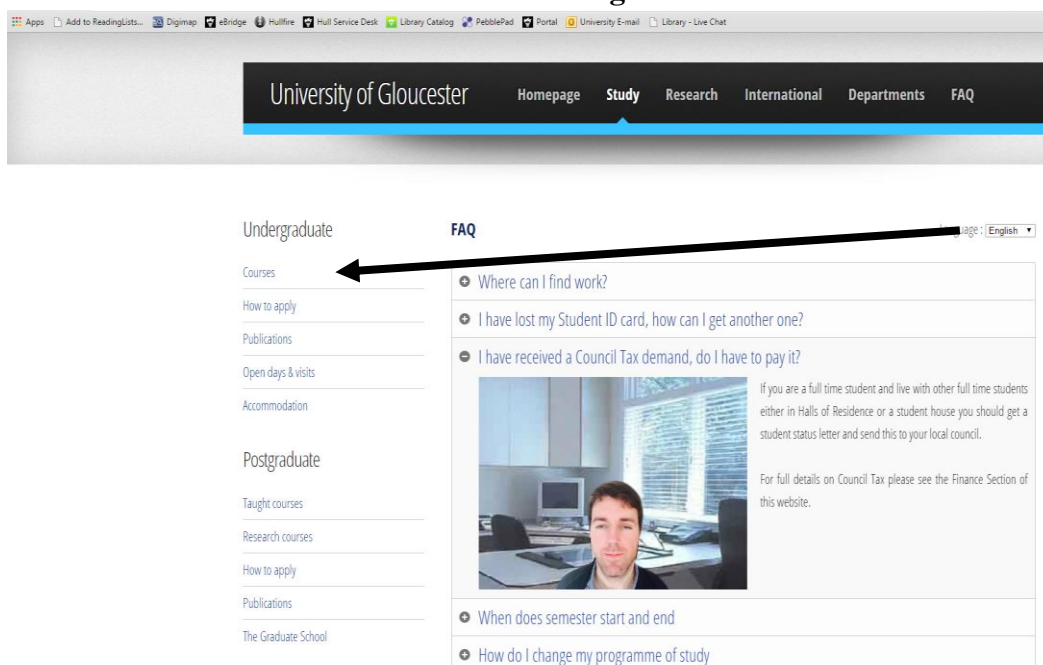
**Dear participant,**

Now, imagine that you are applying for (or is a current student at) University of Gloucester. **Please follow these instructions:**

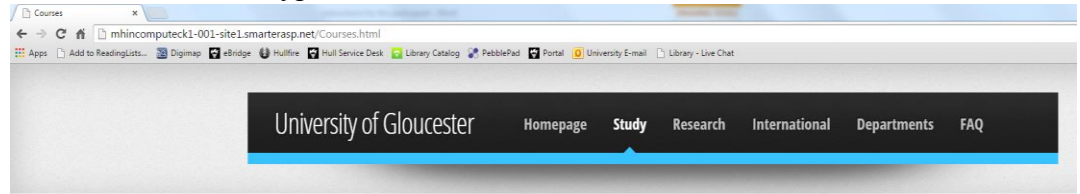
1. Click the **Google Chrome** on the bottom bar of the desktop.



2. Select the “courses” underneath the **undergraduate** title.



3. Select the “**business**” hyperlink underneath the courses title.



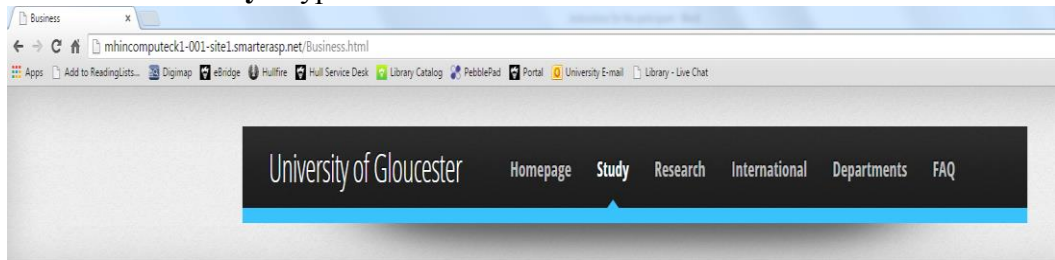
Undergraduate

- Courses
  - How to apply
  - Publications
  - Open days & visits
  - Accommodation
- Postgraduate
- Taught courses
  - Research courses
  - How to apply
  - Publications
  - The Graduate School

Courses

- Business UG N100
- Accounting
- Management UG N200
- Marketing UG N500
- English UG Q300
- Chemistry UG F100
- Psychology UG C800
- Law UG M100
- Physics

4. Press on “**Study**” hyperlink.



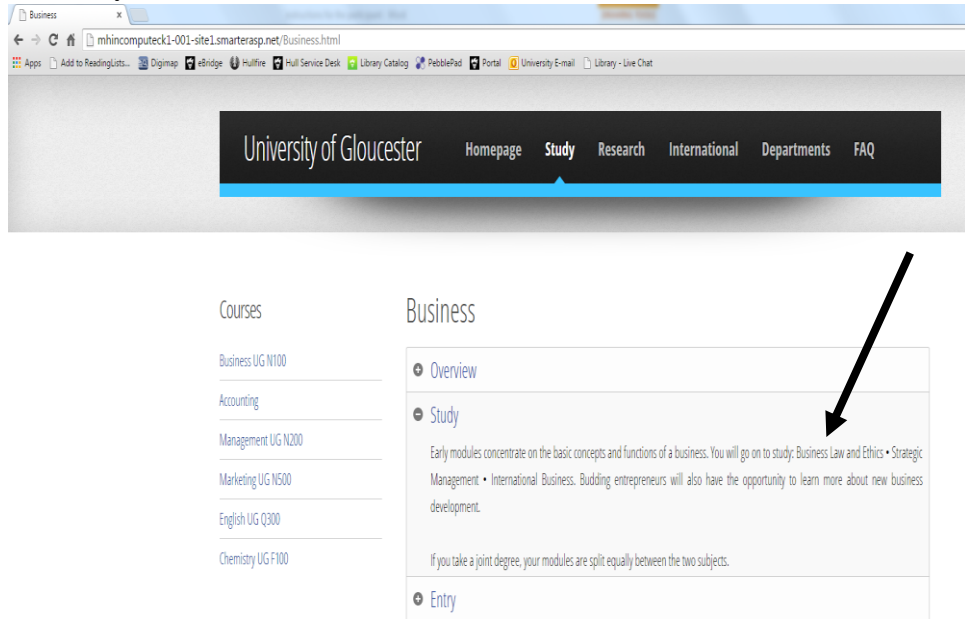
Courses

- Business UG N100
- Accounting
- Management UG N200
- Marketing UG N500
- English UG Q300
- Chemistry UG F100

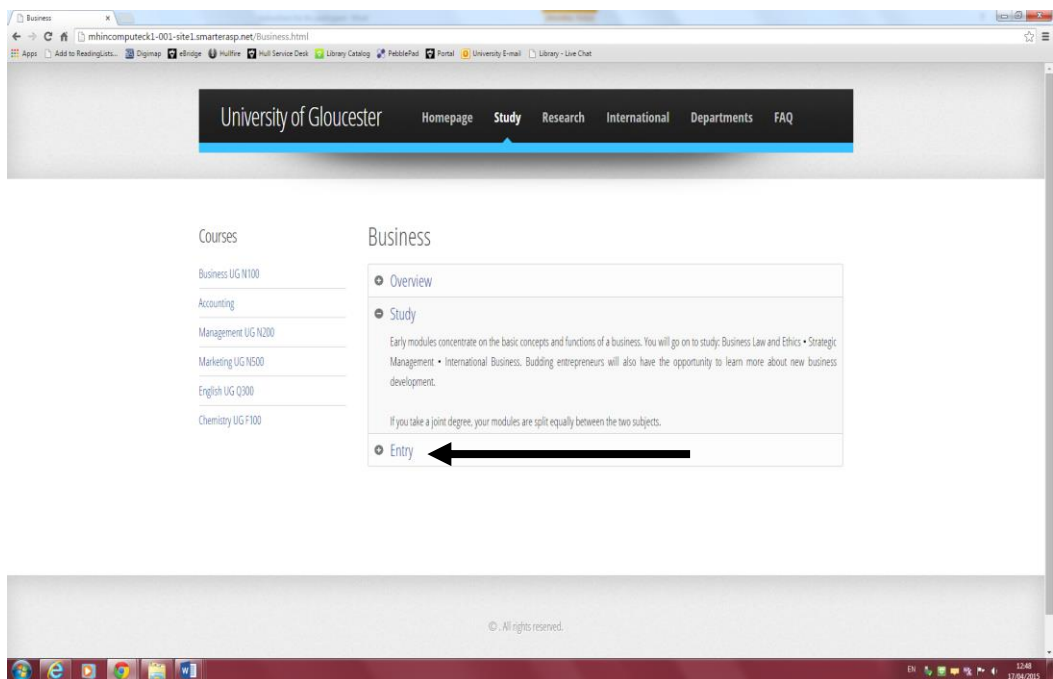
Business

- + Overview
- + Study
- + Entry

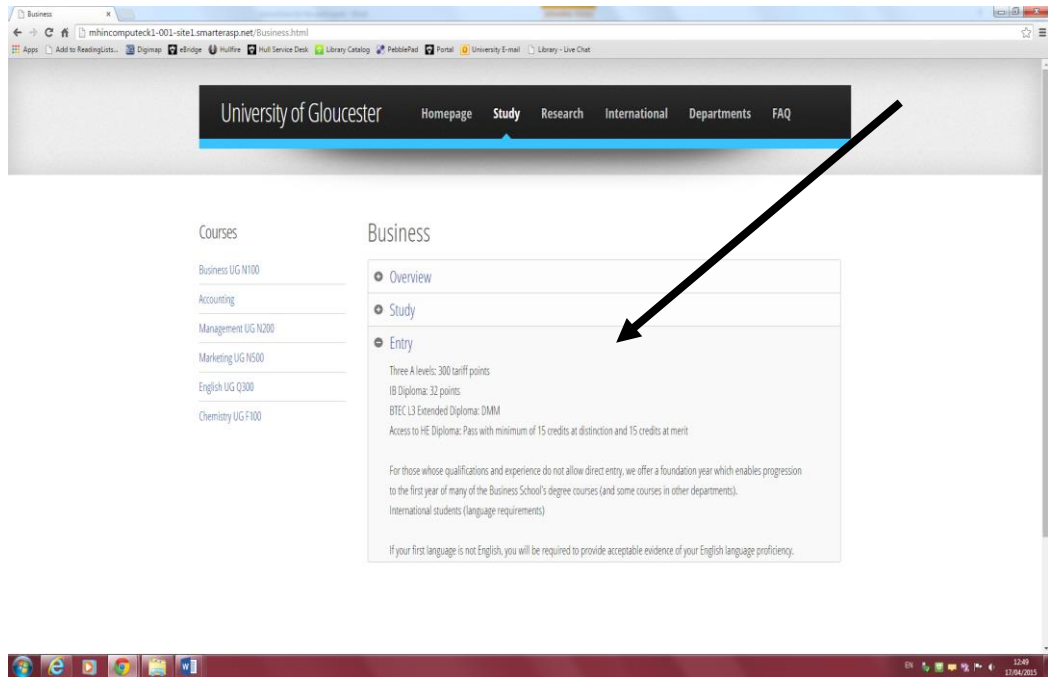
5. Carefully read to the information.



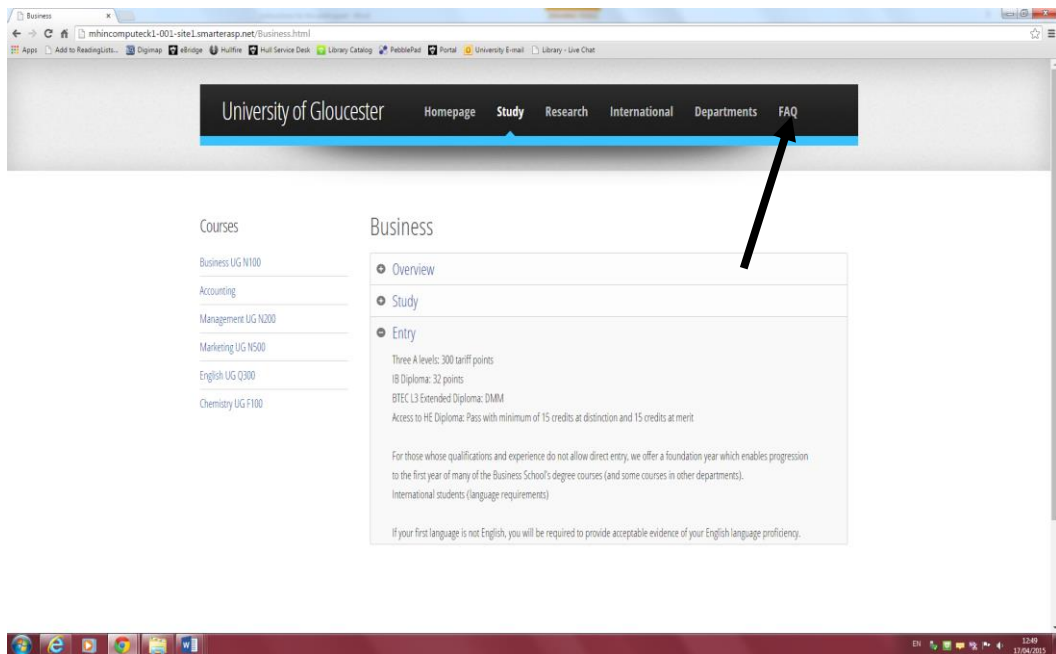
6. Press on “Entry” hyperlink.



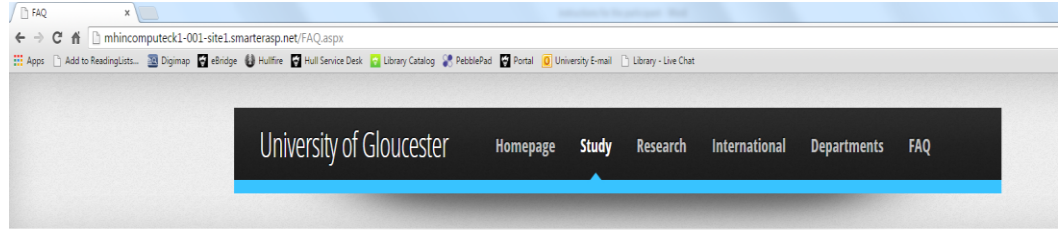
7. Please read the information carefully.



8. Press on “FAQ” on the top bar.



9. Click on “Where can I find work?” question.

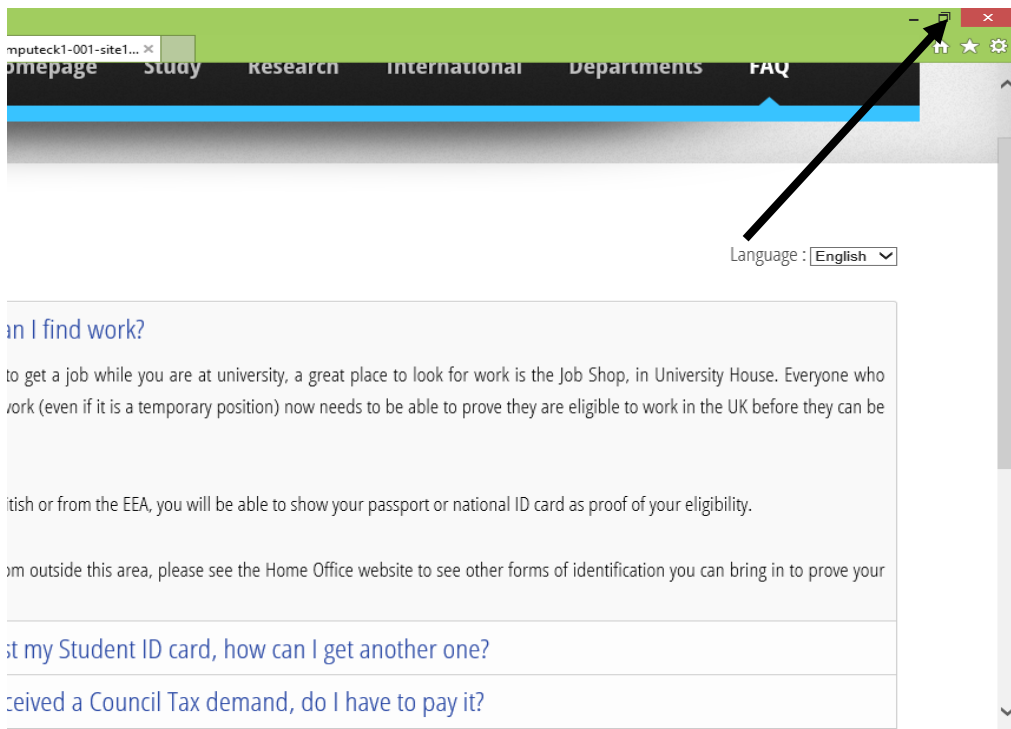


A screenshot of the University of Gloucester FAQ page. The page is divided into 'Undergraduate' and 'Postgraduate' sections. The 'FAQ' section is active, showing a list of questions. The first question, 'Where can I find work?', is selected and highlighted with a black arrow pointing to it. Other questions include 'I have lost my Student ID card, how can I get another one?', 'I have received a Council Tax demand, do I have to pay it?', 'When does semester start and end', and 'How do I change my programme of study'. A language dropdown menu is set to 'English'.

10. Please read the information carefully.

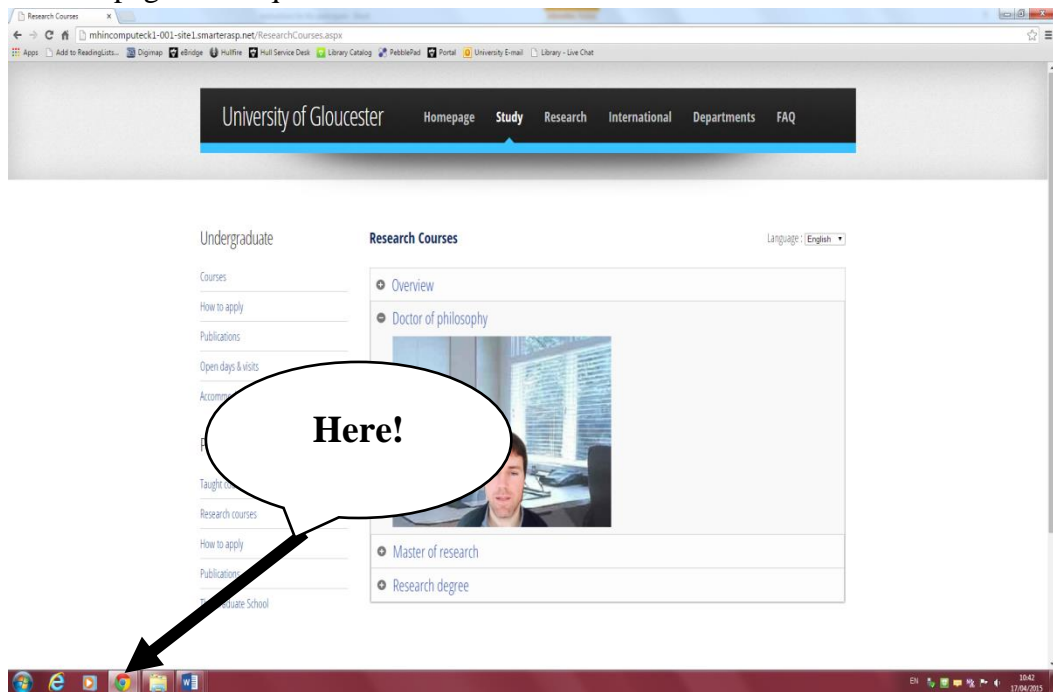
A screenshot of the University of Gloucester FAQ page, showing the 'Where can I find work?' question expanded. The answer text reads: 'If you want to get a job while you are at university, a great place to look for work is the Job Shop, in University House. Everyone who applies for work (even if it is a temporary position) now needs to be able to prove they are eligible to work in the UK before they can be employed. If you are British or from the EEA, you will be able to show your passport or national ID card as proof of your eligibility. If you are from outside this area, please see the Home Office website to see other forms of identification you can bring in to prove your eligibility.' Below the answer are two other questions: 'I have lost my Student ID card, how can I get another one?' and 'I have received a Council Tax demand, do I have to pay it?'. The language dropdown menu is set to 'English'.

11. Please **minimize** the Google chrome window.



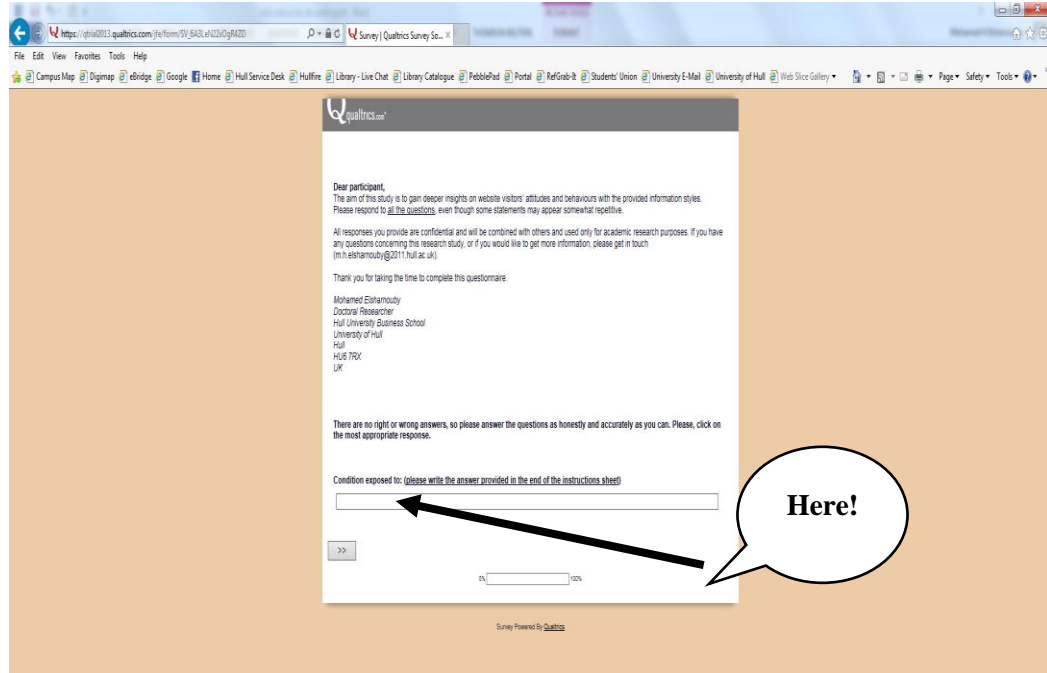
Now,

1. Click on the **internet explorer** on the bottom bar of the desktop. You will find the first page of the questionnaire.





2. Please write **“written information style”** as the answer of the first question.



3. Please continue to answering all remaining questions.

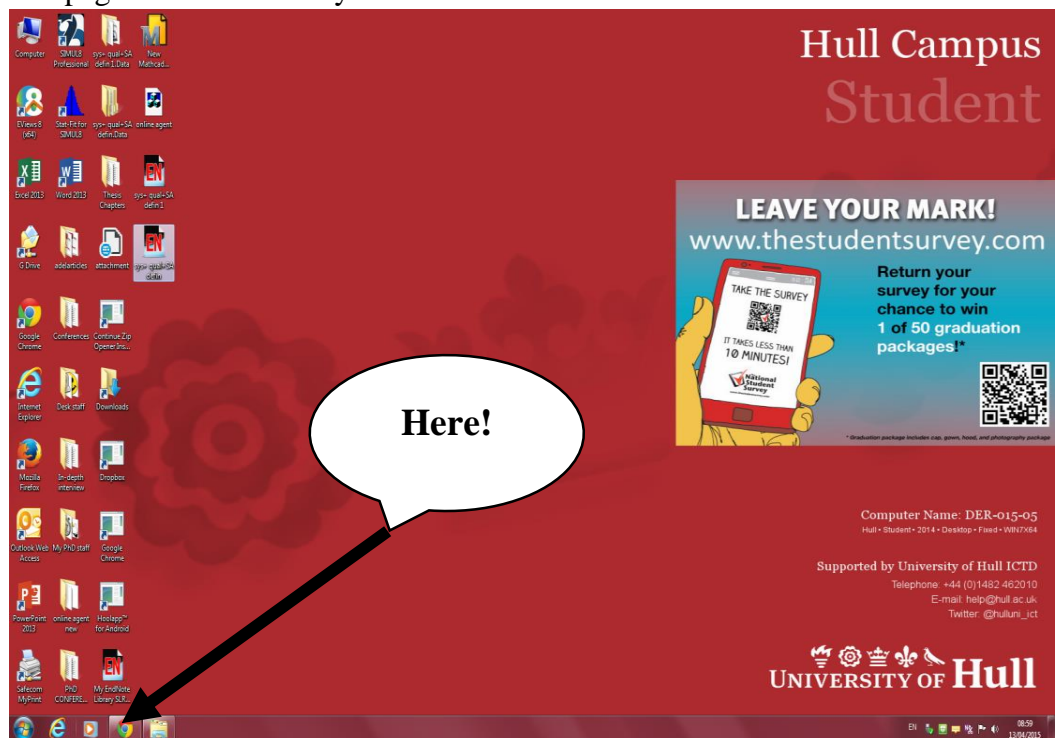
**Many thanks and I really appreciate your effort**

## Appendix F. 2: Instructions sheet (Study two): Admin-avatar

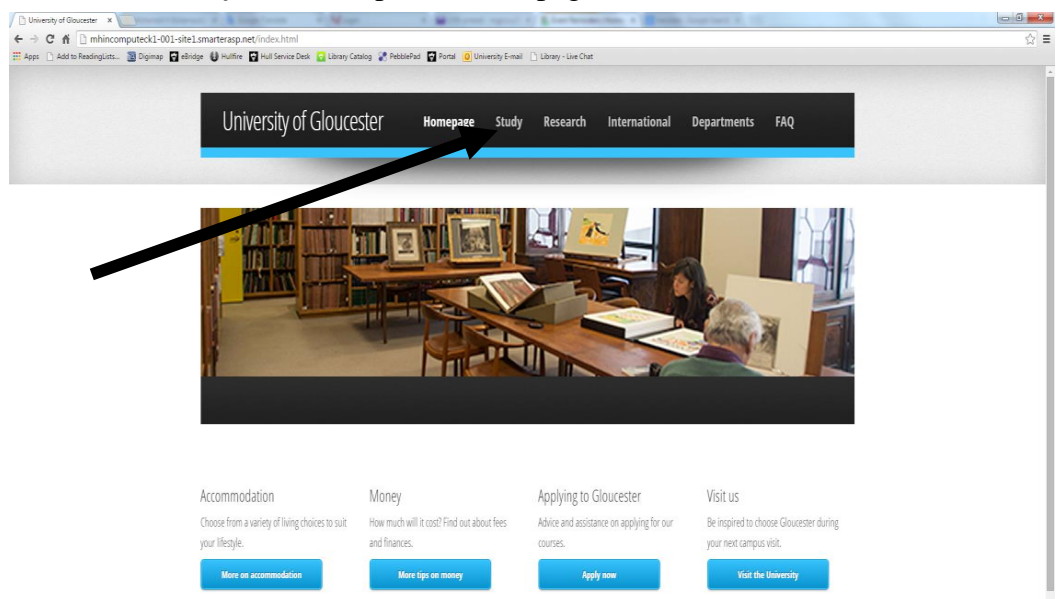
Dear participant,

Imagine that you are applying for (or is a current student at) University of Gloucester. When you browse its website, you will find an admin-avatar, a feature on the website gives you website information orally. To see this feature, please follow these instructions:

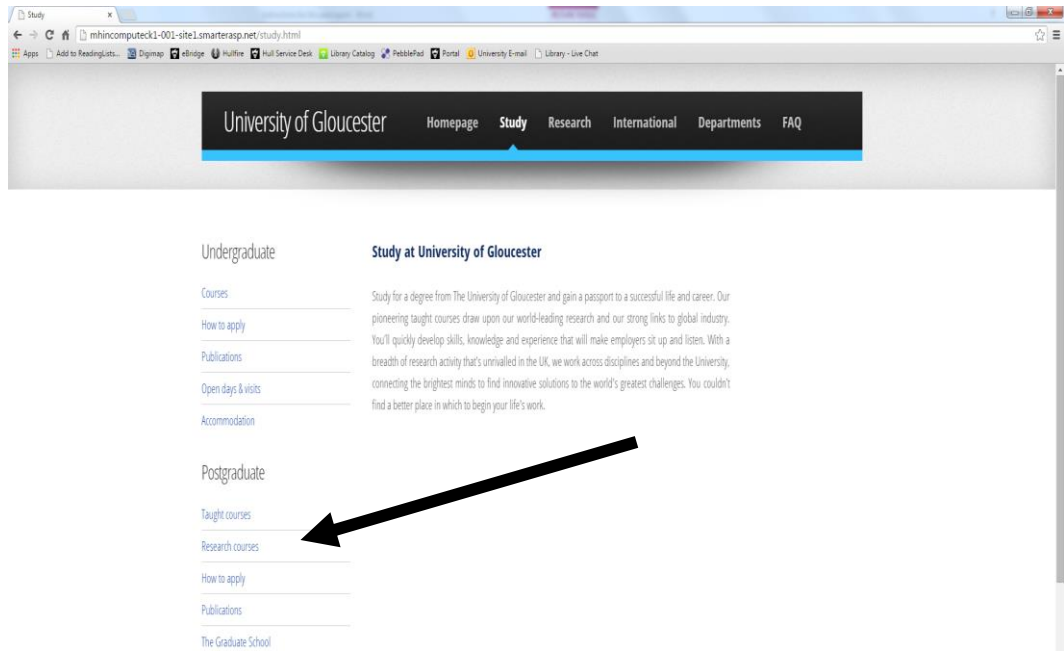
1. Click on the current **Google Chrome** on the bottom bar of the desktop. You find the home page of the University of Gloucester.



2. Click on the "study" on the top bar of this page.

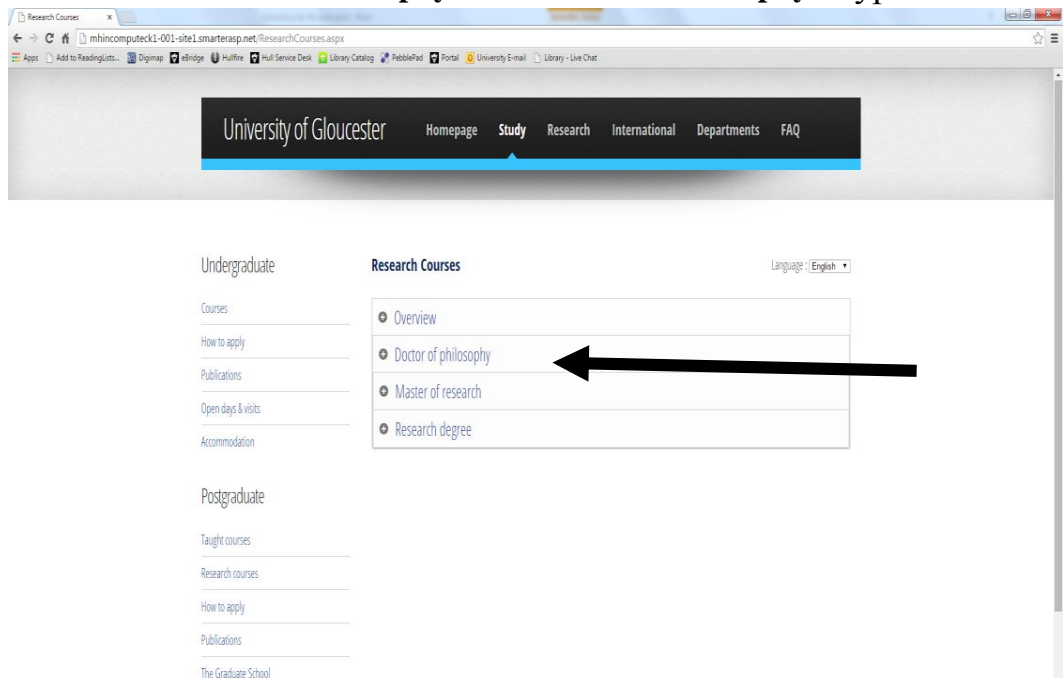


3. Select the “**Research courses**” underneath the **postgraduate** title.

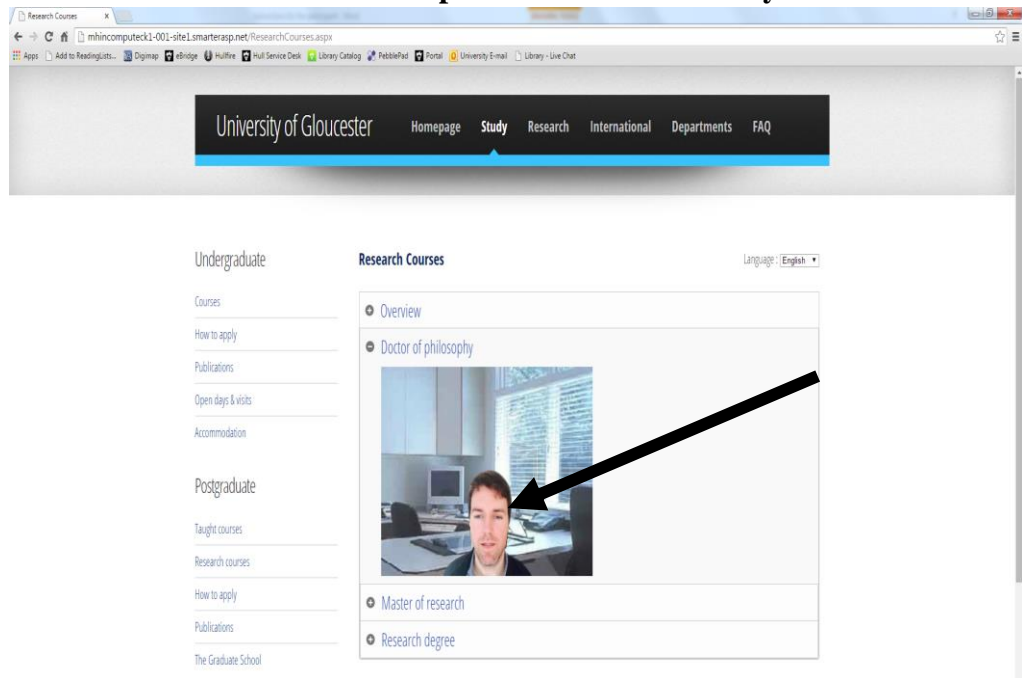


4. Use the “**headset**” to listen the information.

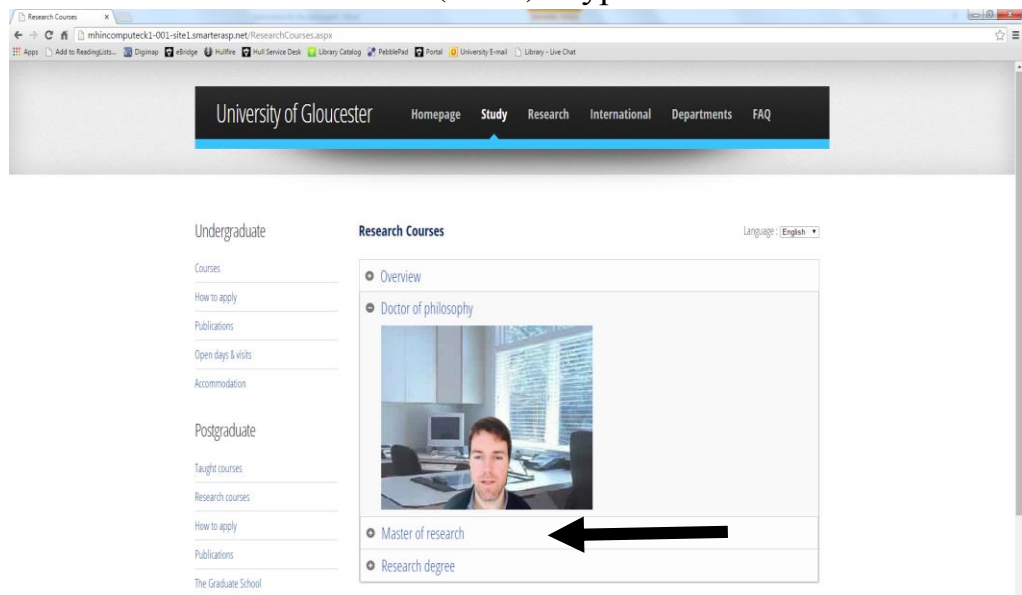
5. Click on “**Doctor of Philosophy and Master of Philosophy**” hyperlink.



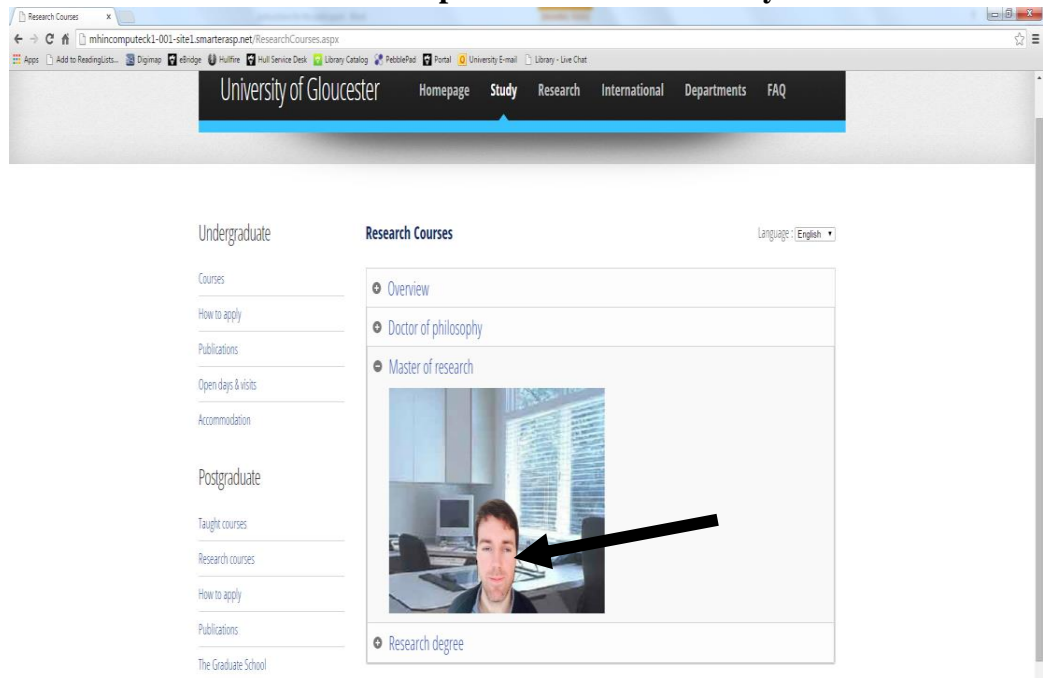
6. Place the mouse on **the face** and press and listen carefully.



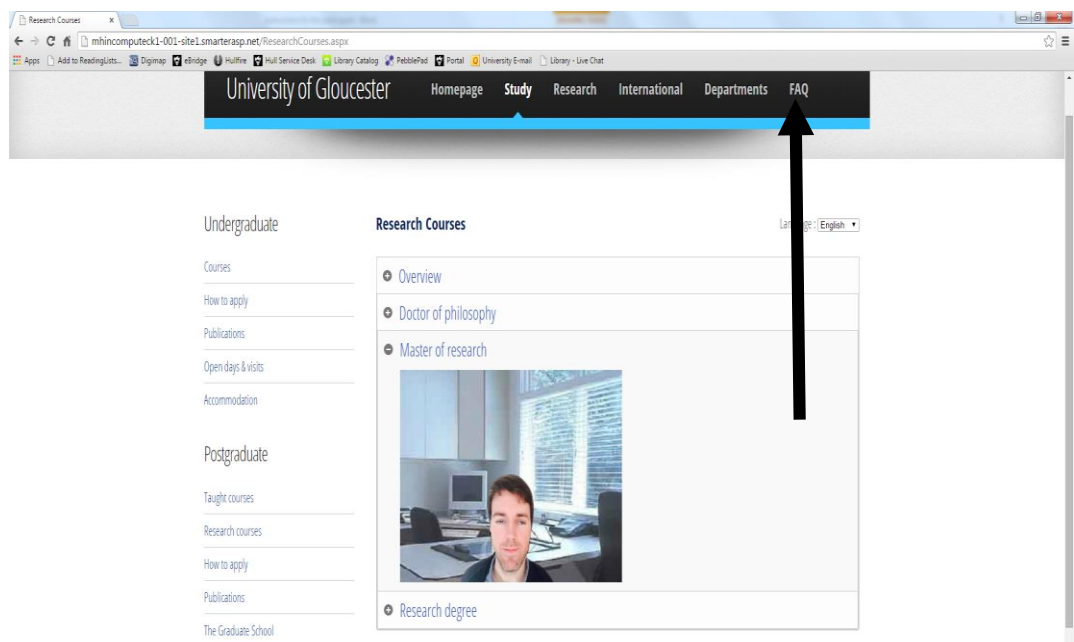
7. Press on “**Master of Research (MRes)**” hyperlink.



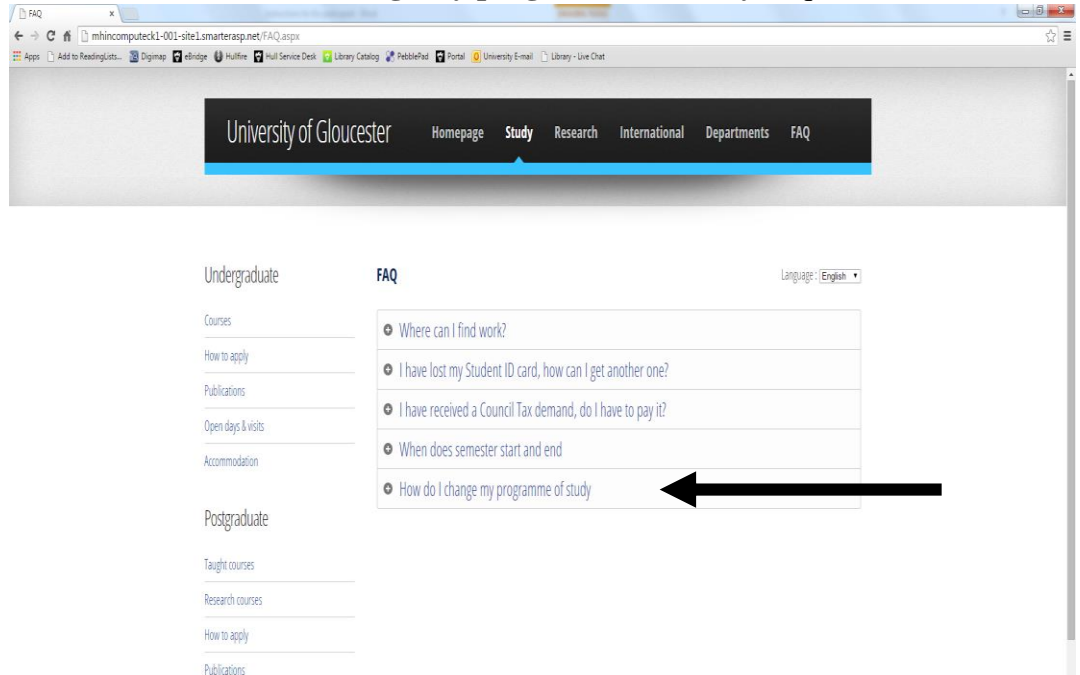
8. Place the mouse on **the face** and press and listen carefully.



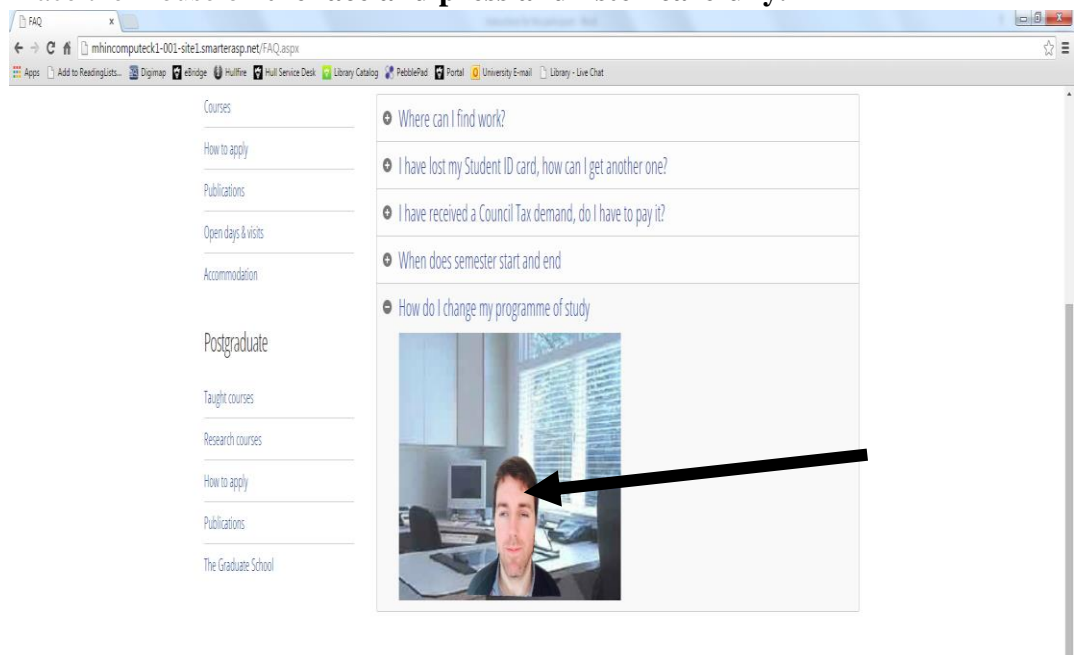
9. Press on **“FAQ”** on the top bar.



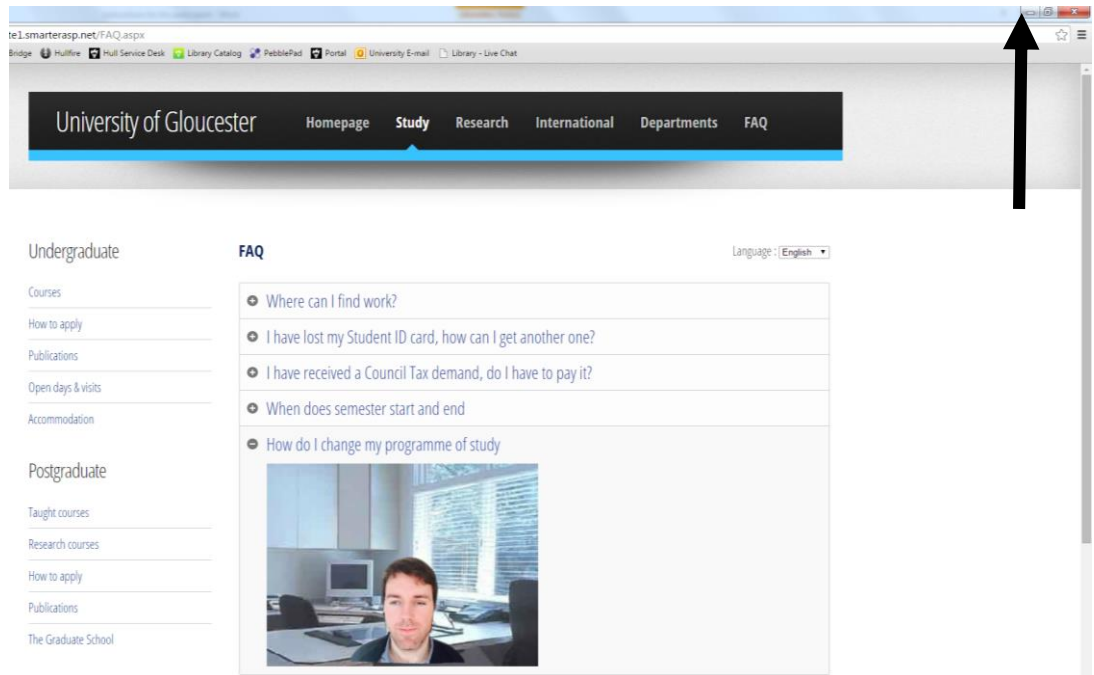
10. Click on the “How do I change my programme of study?” question.



11. Place the mouse on the face and press and listen carefully.

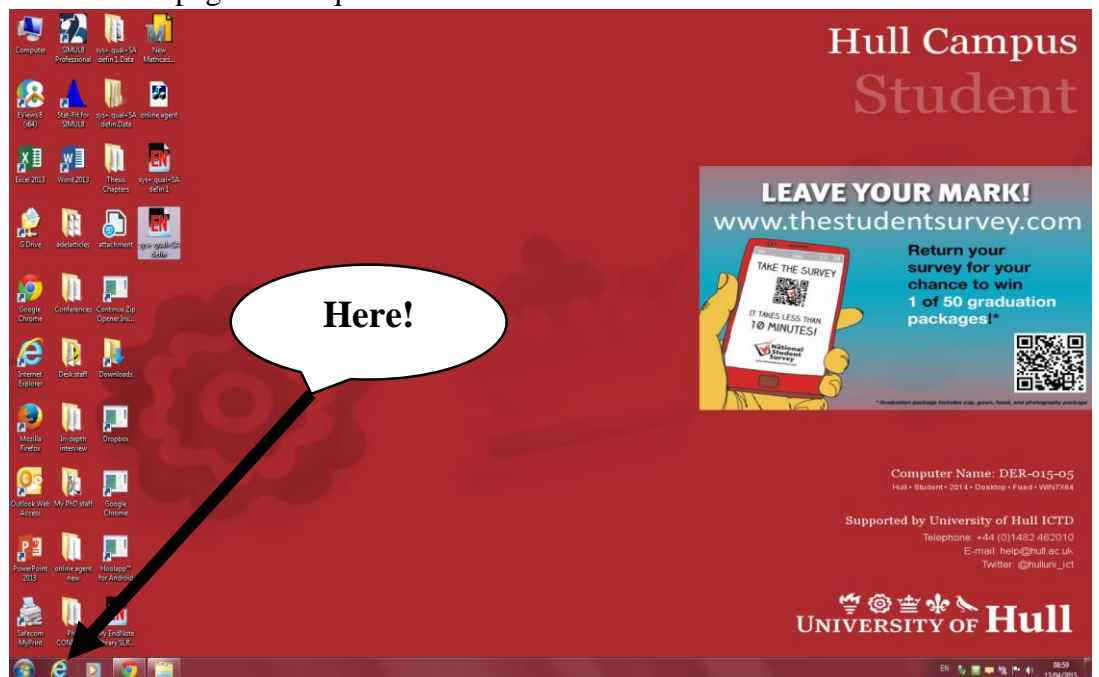


12. Minimize the Google chrome window.

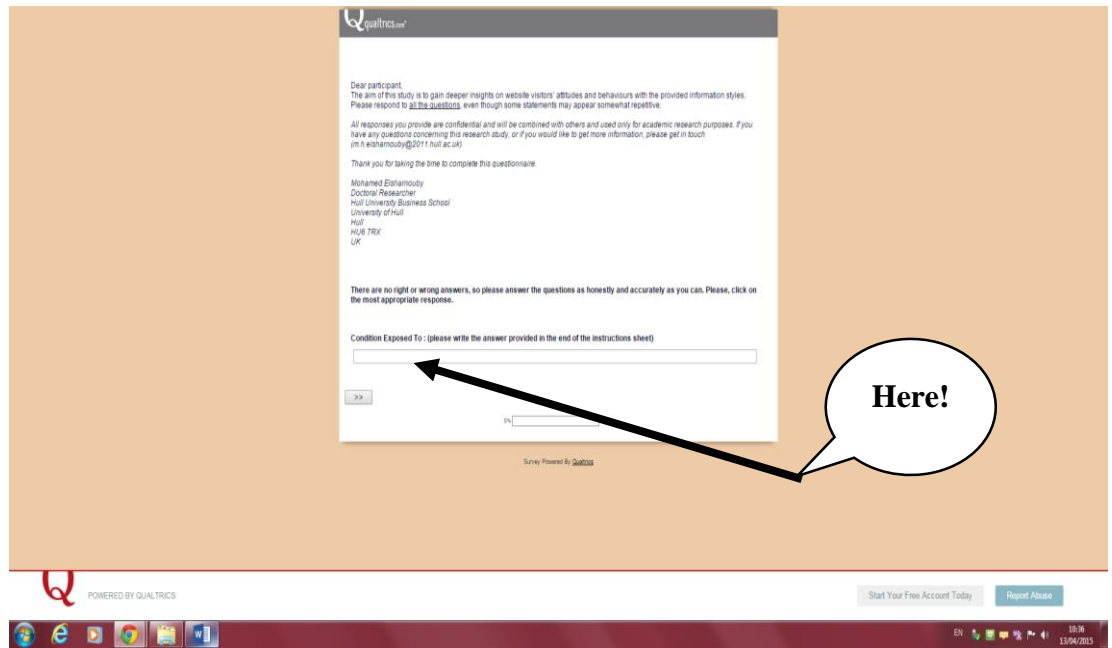


Now,

1. Press on the current **internet explorer** on the bottom bar of the desktop. You will find the first page of the questionnaire.



2. Please write **admin-avatar** as the answer of the first question.



3. Please continue to answer all remaining questions.

**Many thanks and I really appreciate your effort!**

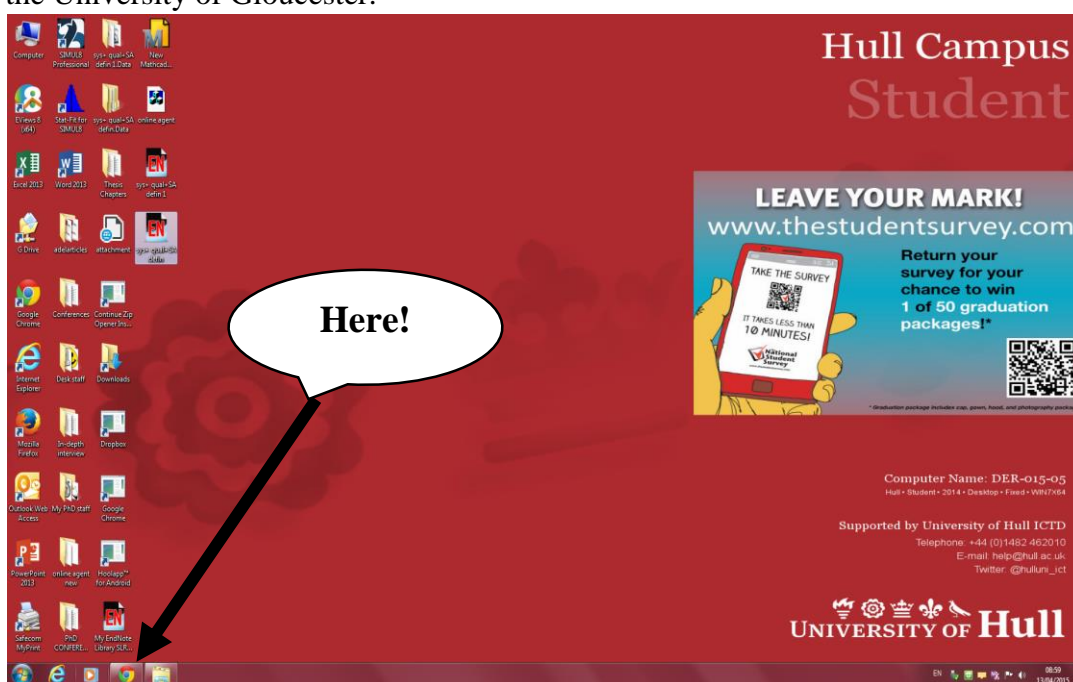


### Appendix F. 3: Instructions sheet (Study two): Admin-avatar based on text

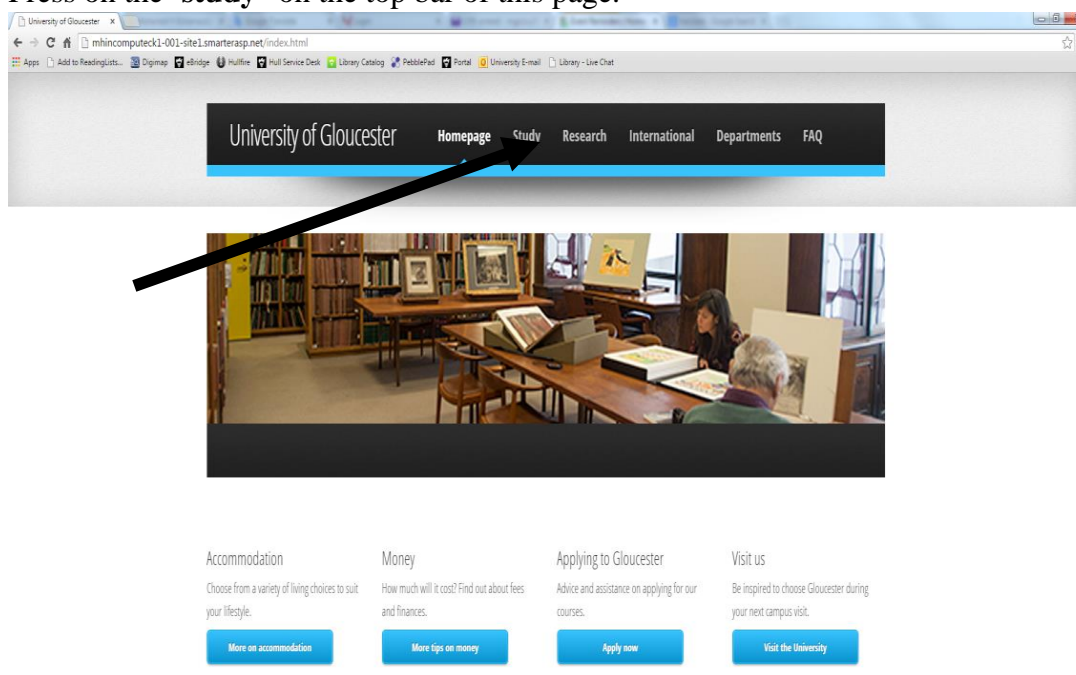
Dear participant,

Imagine that you are applying for (or is a current student at) University of Gloucester. When you browse its website, you will find an admin-avatar based on text, a feature on the website that gives you website the information orally. You can also see the information while the admin-avatar is speaking. To see this feature, please follow these instructions:

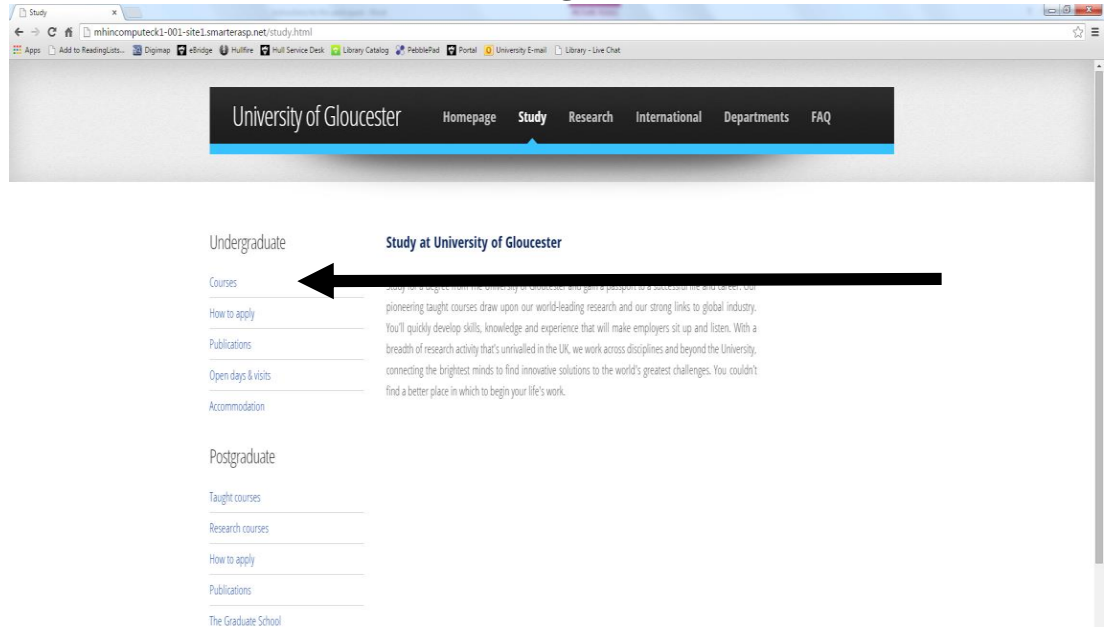
1. Click **Google Chrome** on the bottom bar of the desktop. You find the home page of the University of Gloucester.



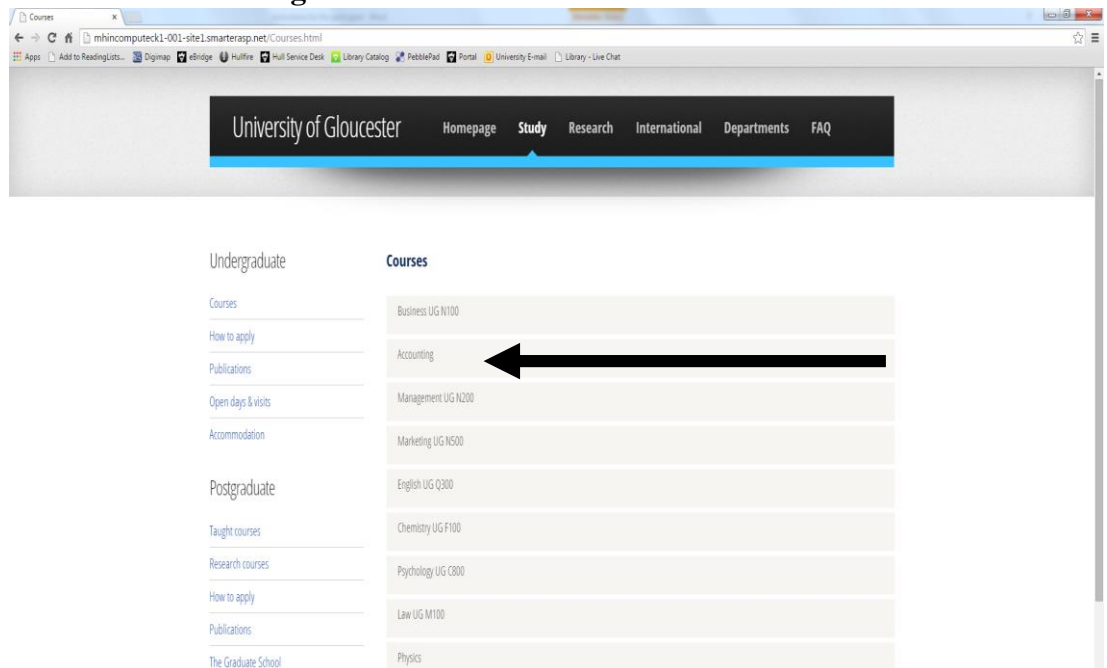
2. Press on the "study" on the top bar of this page.



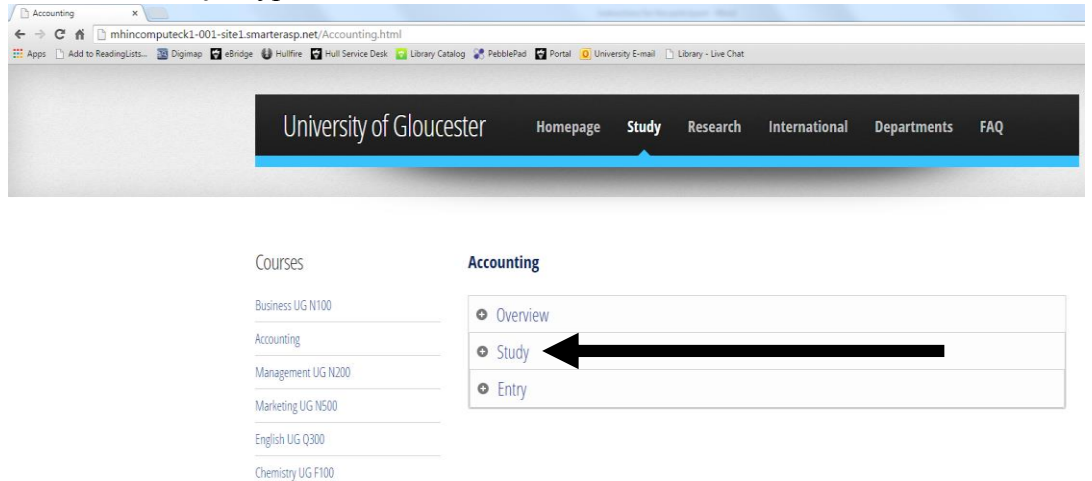
3. Select the “**courses**” underneath the **undergraduate** title.



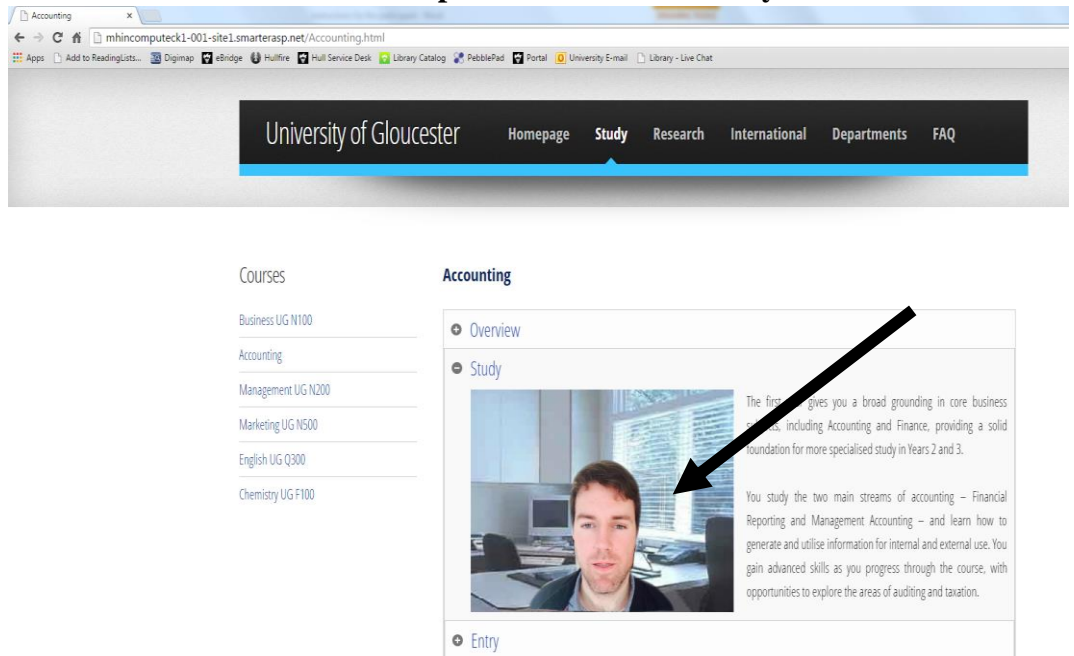
4. Use the “**headset**” to listen the information.
5. Select the “**accounting**” underneath the **Courses** title.



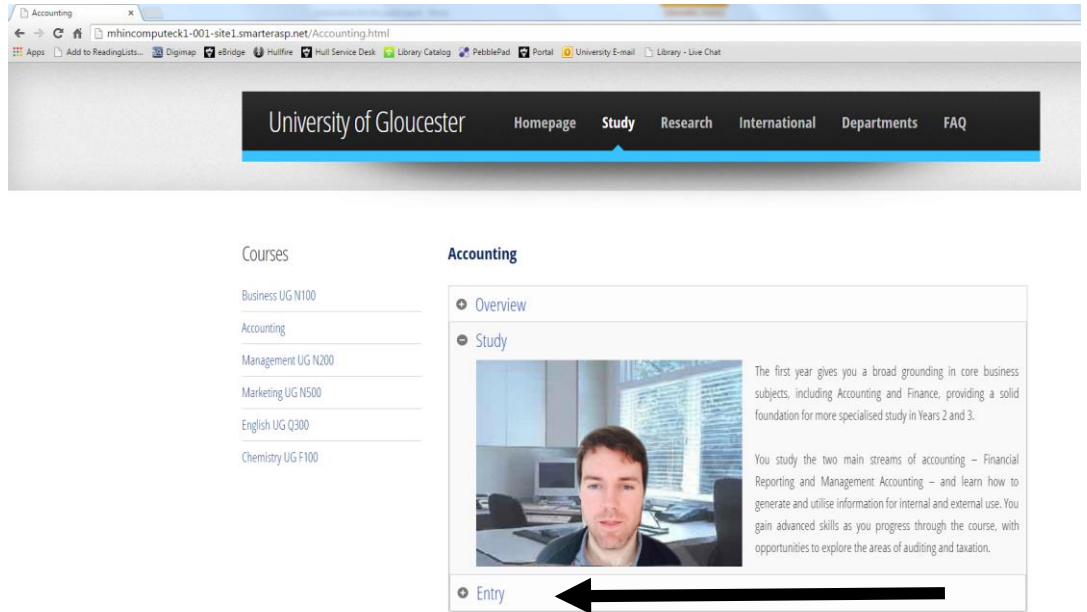
6. Press on “Study” hyperlink.



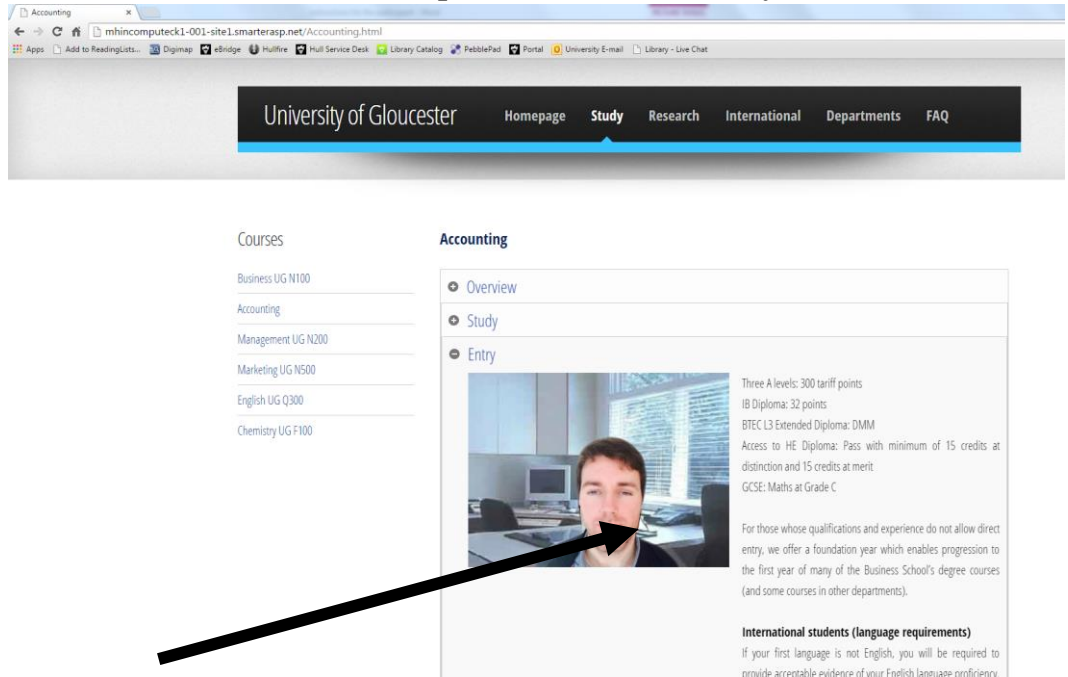
7. Place the mouse on **the face** and press and listen carefully.



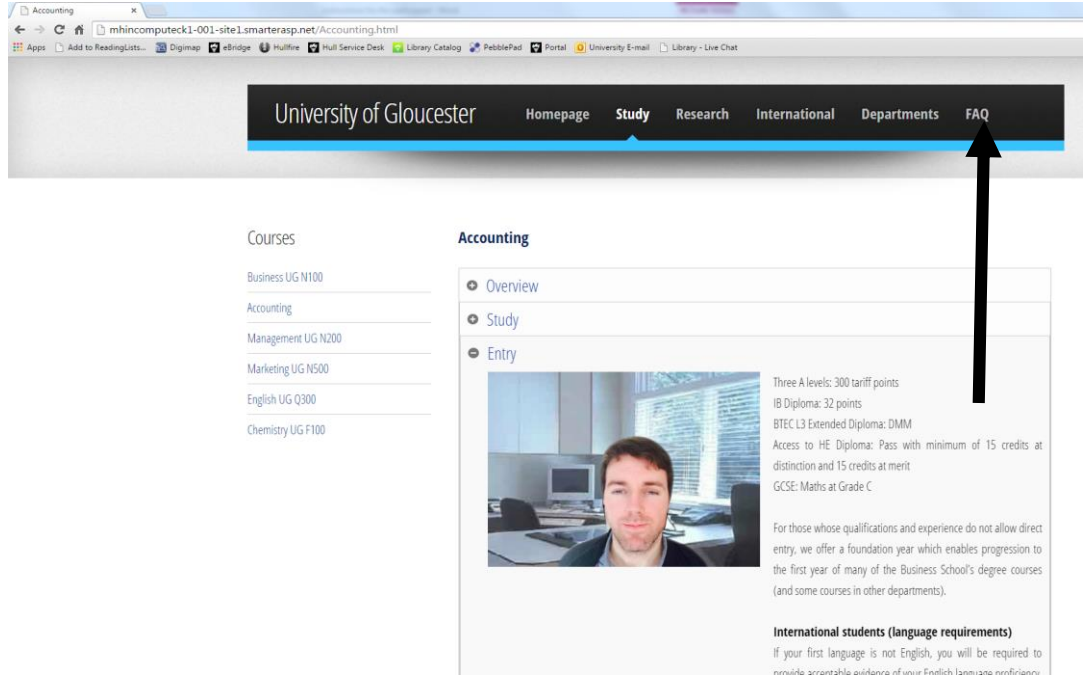
8. Press on “Entry” hyperlink .



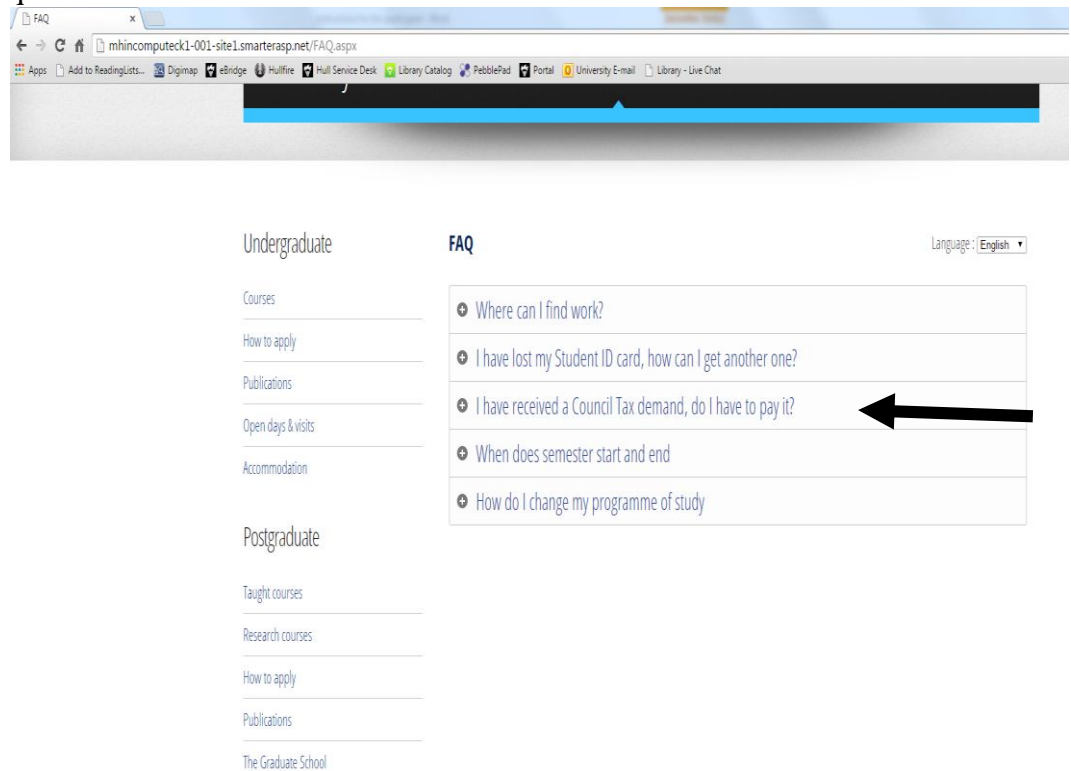
9. Place the mouse on **the face** and press and listen carefully.



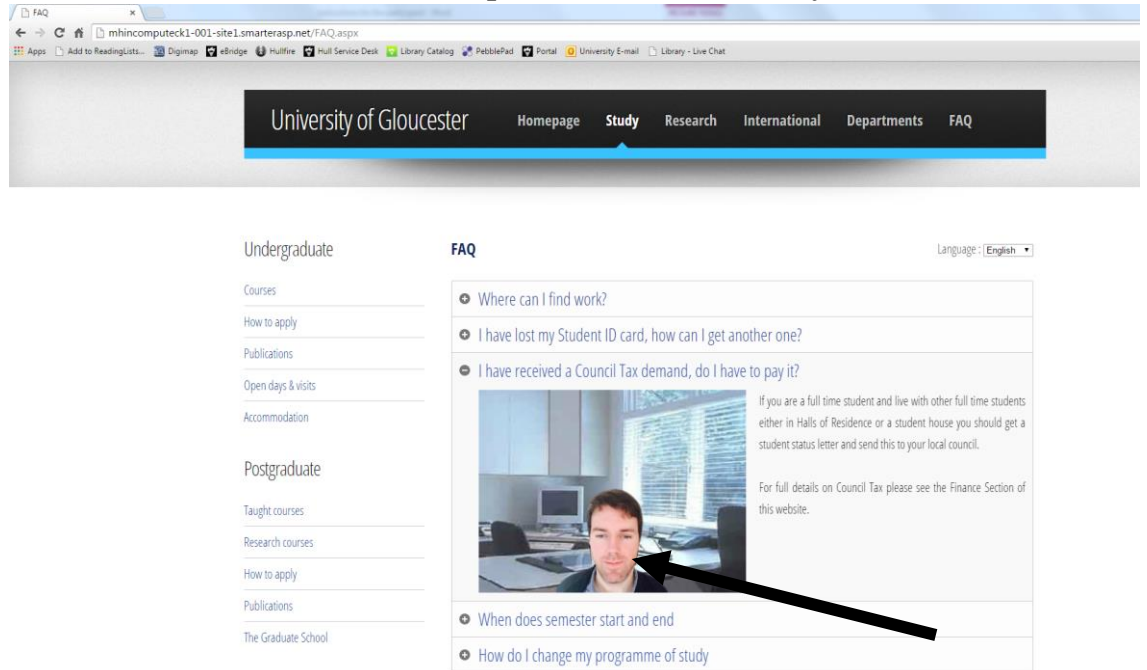
10. Press on “FAQ” on the top bar.



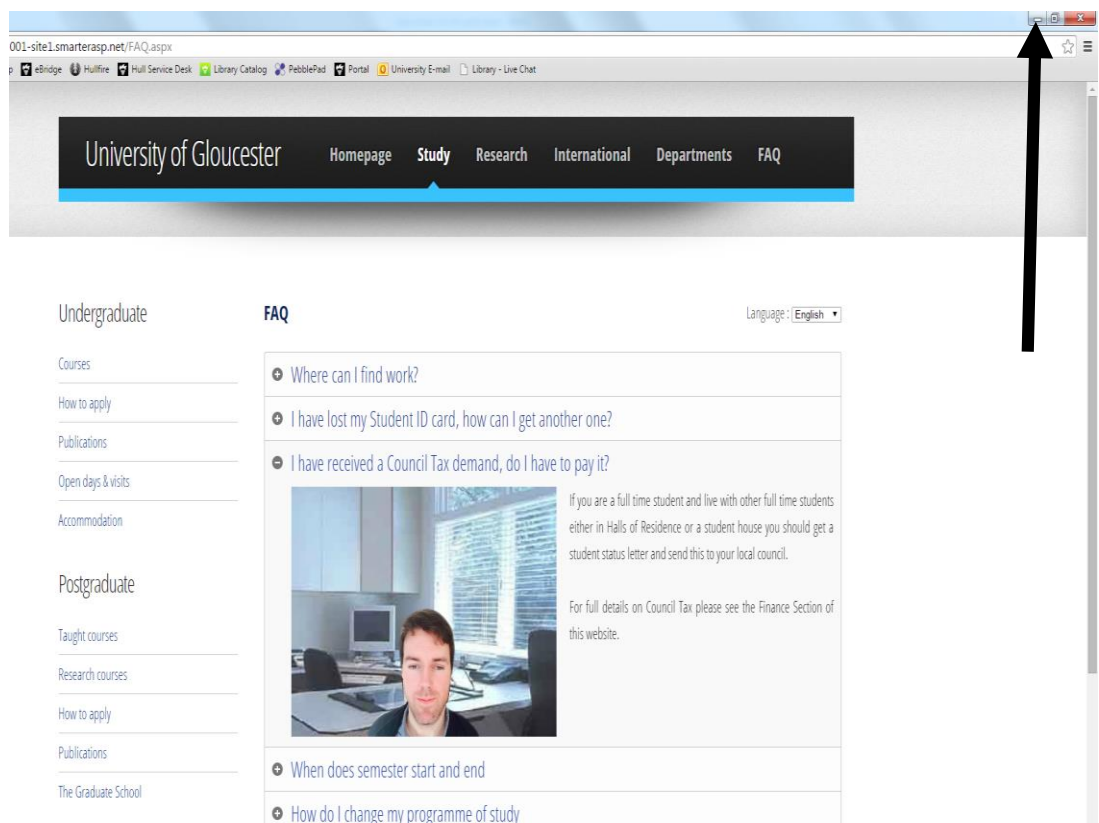
11. Press on the “I have received a Council Tax demand, do I have to pay it?” question.



12. Place the mouse on **the face** and press and listen carefully.



13. Minimize the Google chrome window.

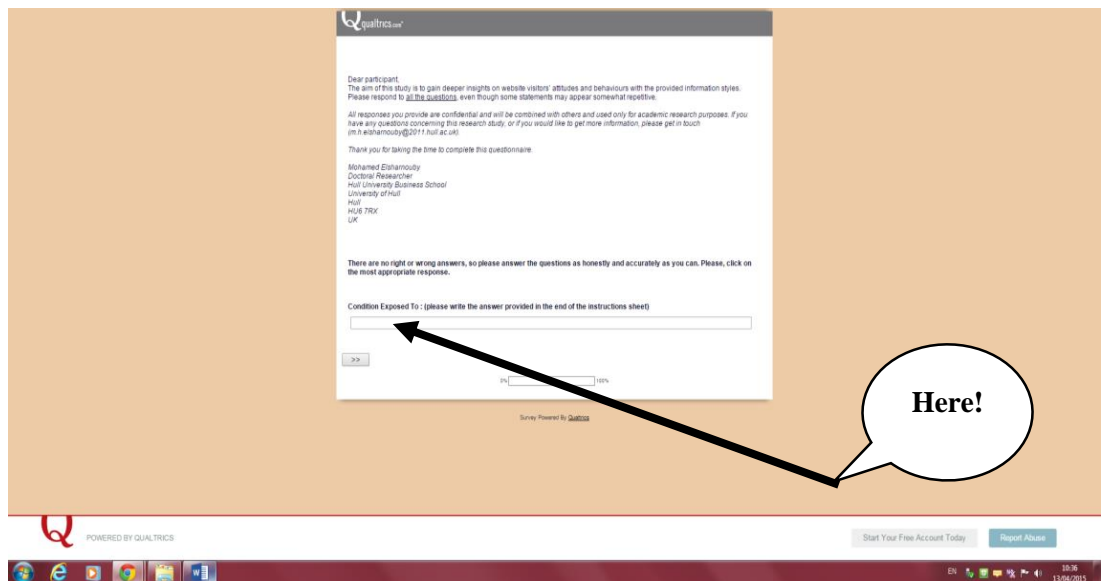


Now,

1. Click on the **internet explorer** on the bottom bar of the desktop. You will find the first page of the questionnaire.



2. Please write **“admin-avatar based on text”** as the answer of the first question.



3. Please continue to answer all the remaining questions.

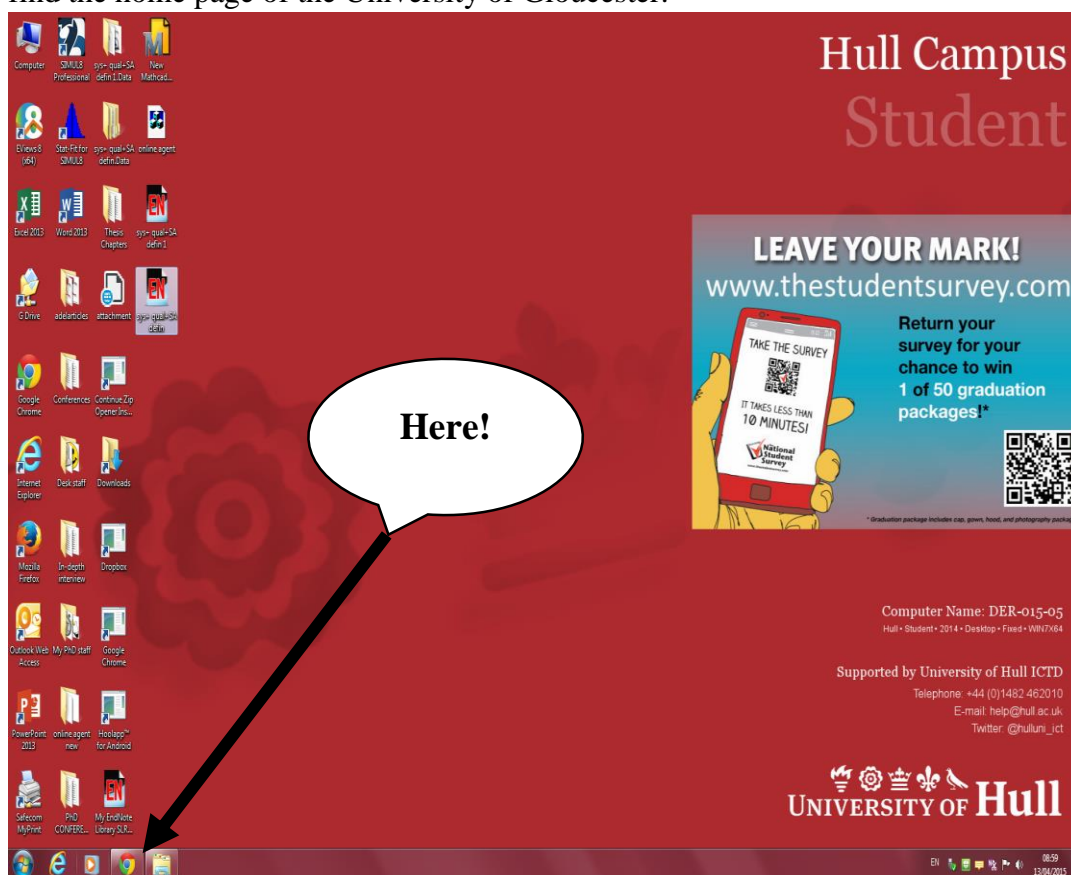
**Many thanks and I really appreciate your effort!**

## Appendix F. 4: Instructions sheet (Study two): Admin-avatar with own language

Dear participant,

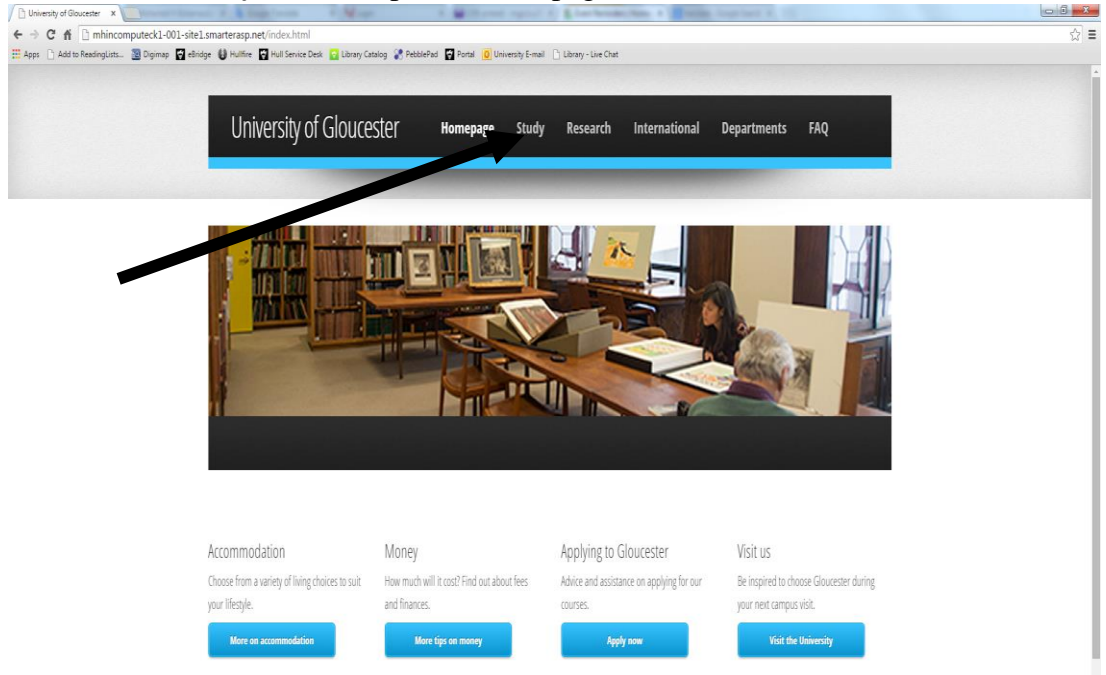
Imagine that you are applying for (or is a current student at) the University of Gloucester. When you browse its website, you will find **an admin-avatar with own language**, a feature on the website gives you the information orally in **your own language**. To see this feature, **please follow these instructions**:

1. Press on the current **Google Chrome** found on the bottom bar of the desktop. You find the home page of the University of Gloucester.

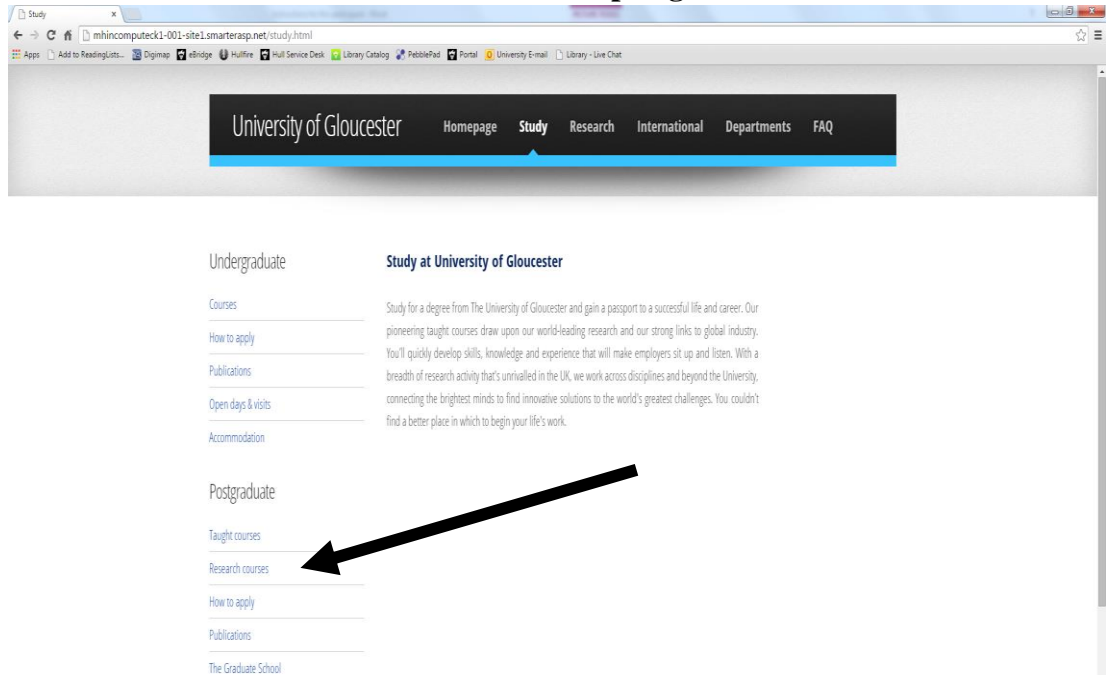




2. Press on the "study" on the top bar of this page.

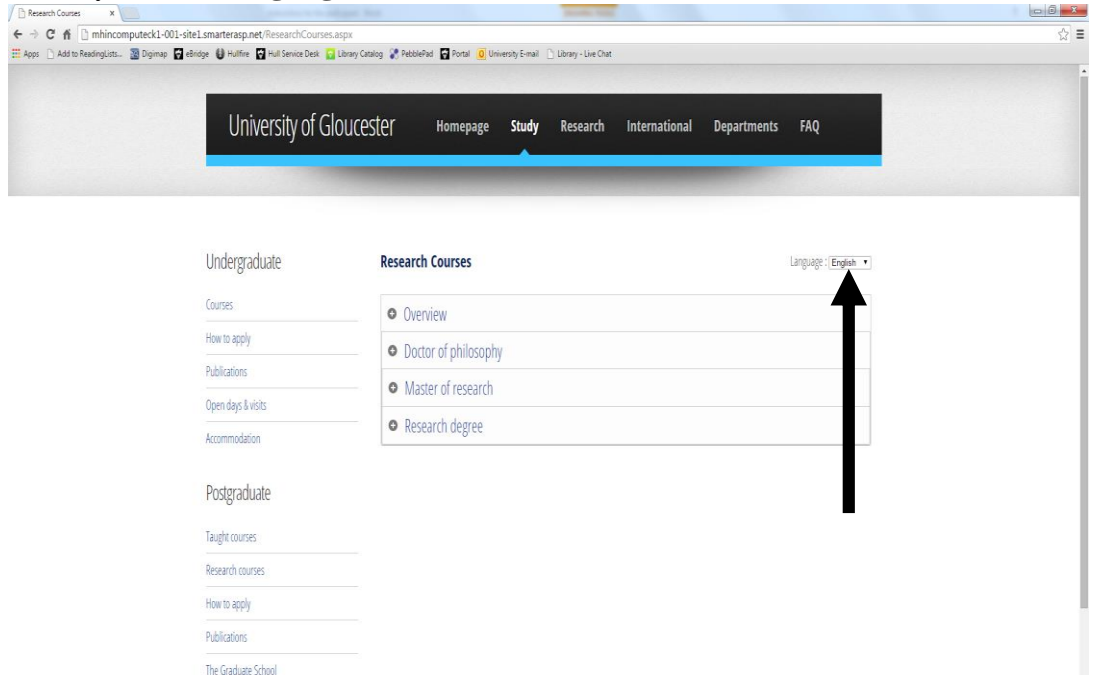


3. Select the "Research courses" underneath the **postgraduate** title.

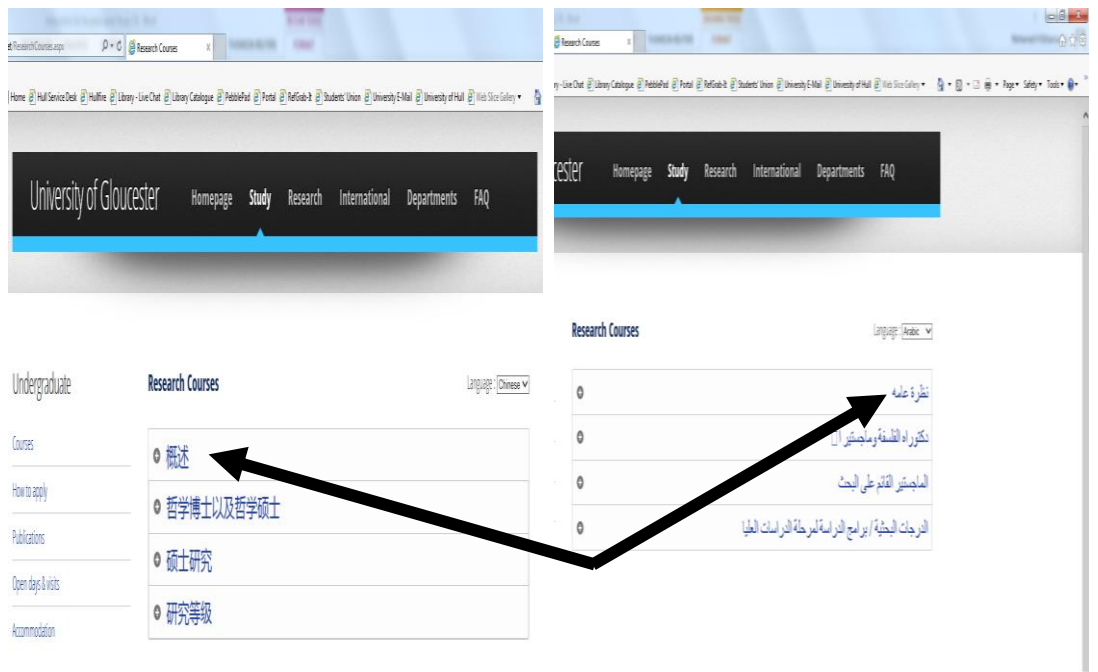


4. Use the "headset" to listen the information.

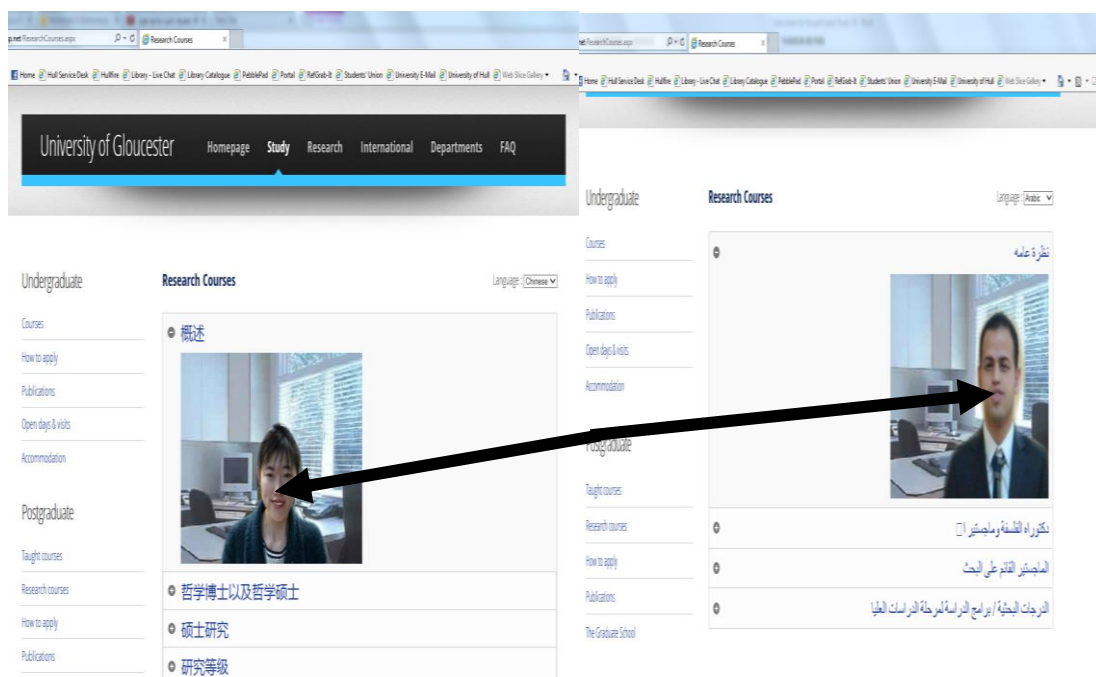
5. Select your own language Arabic/ Chinese



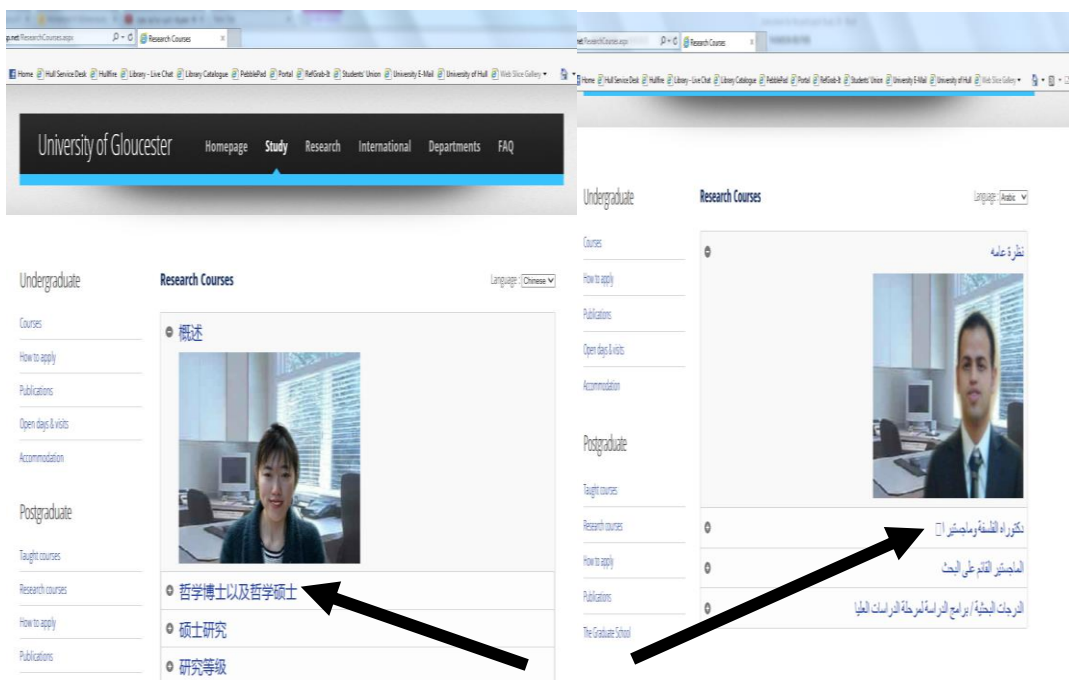
6. Press on “نظرة عامة” or “概述” hyperlink.



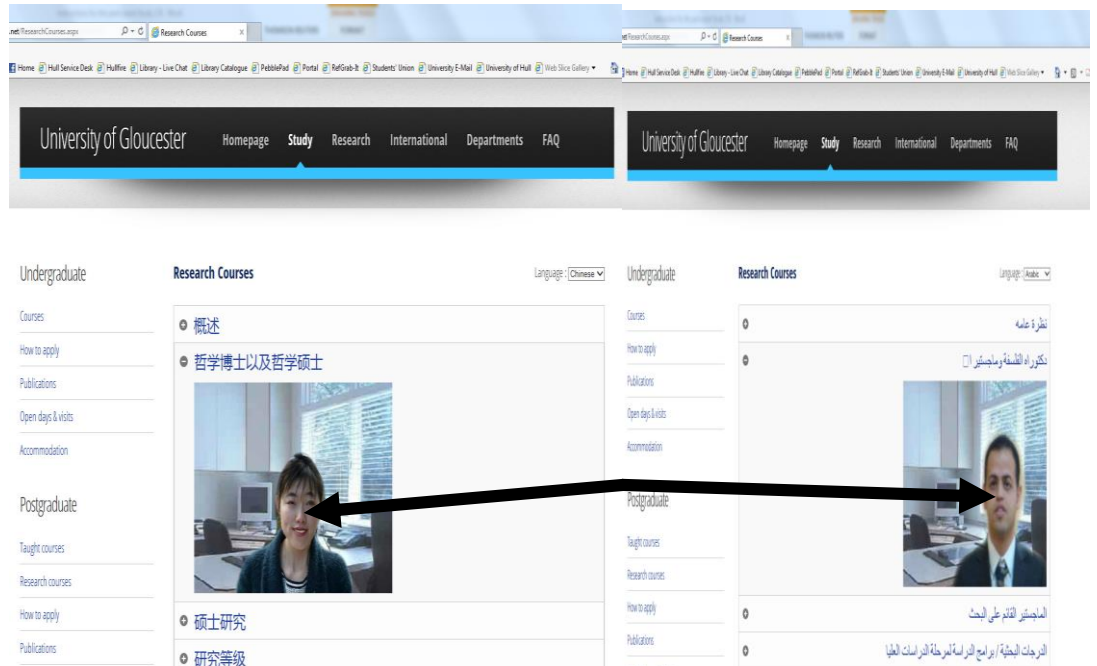
7. Place the mouse on the face and press and listen carefully.



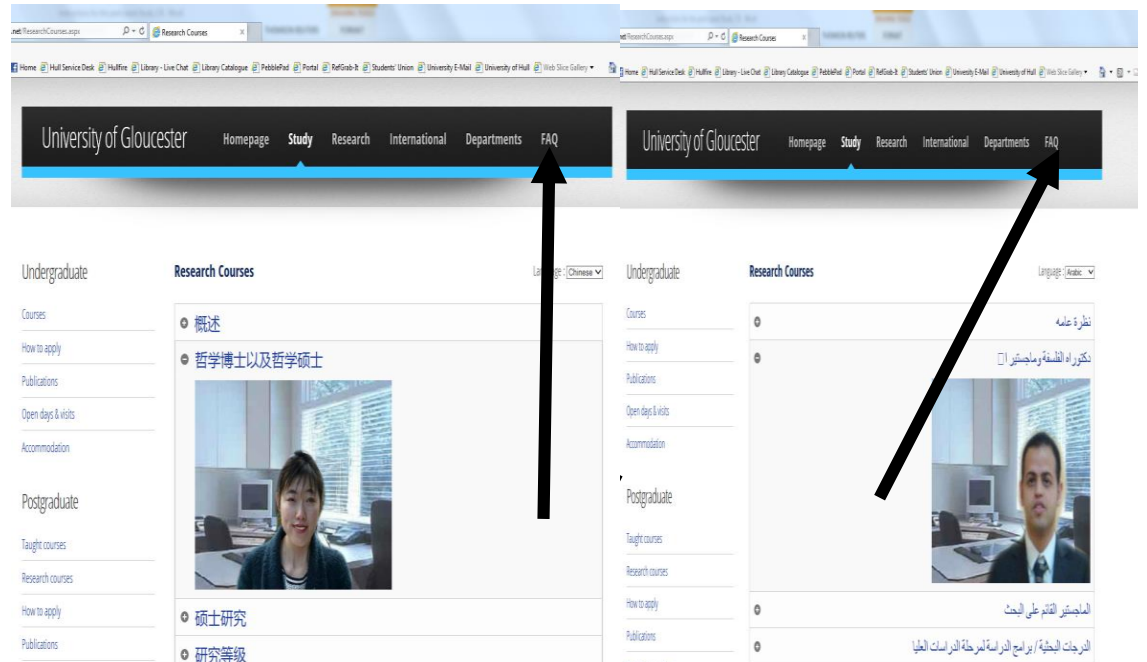
8. Press on “[哲学博士以及哲学硕士](#)” “[دكتوراه الفلسفة وماجستير الفلسفة](#)” hyperlink.



9. Place the mouse on **the face** and press and listen carefully.

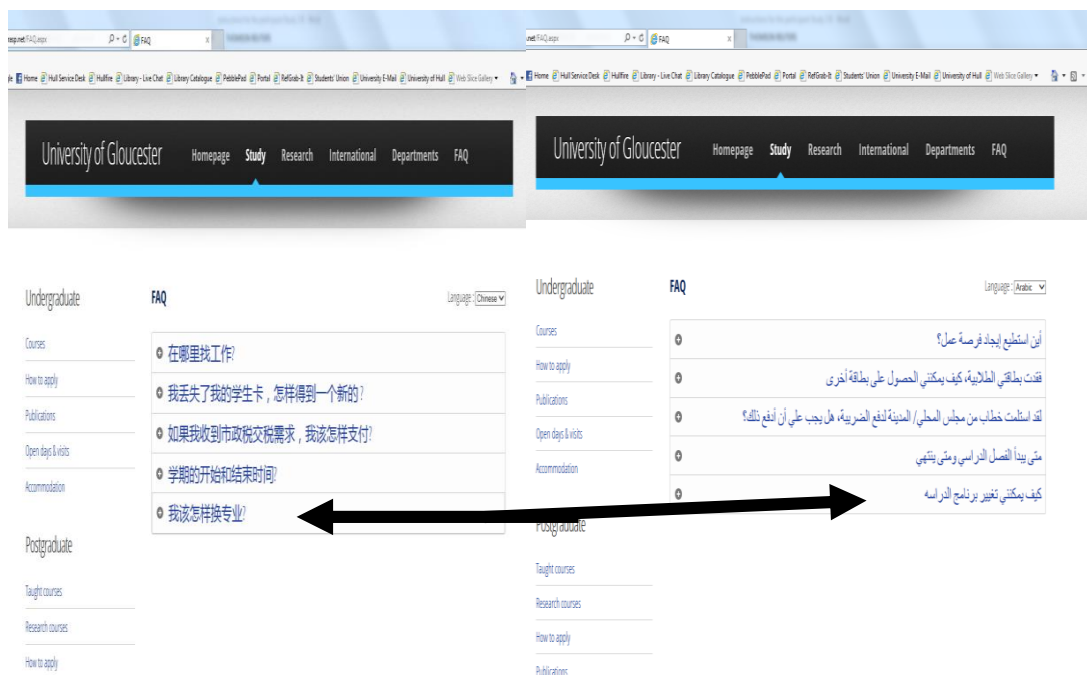


10. Press on **“FAQ”** on the top bar.

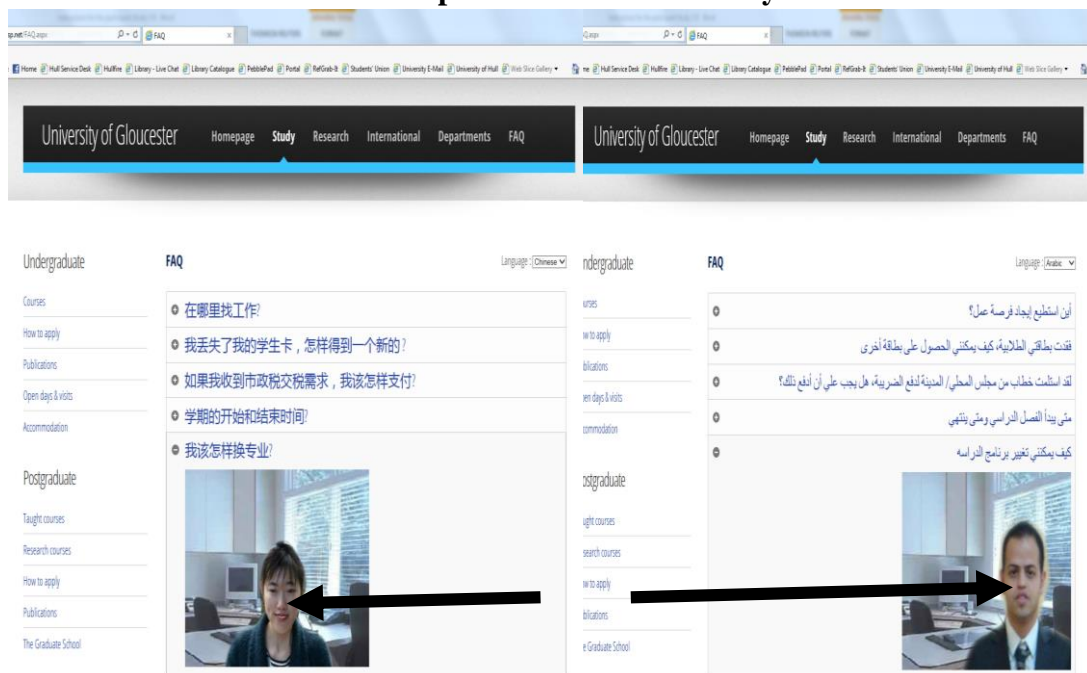


11. Select your own language Arabic/ Chinese.

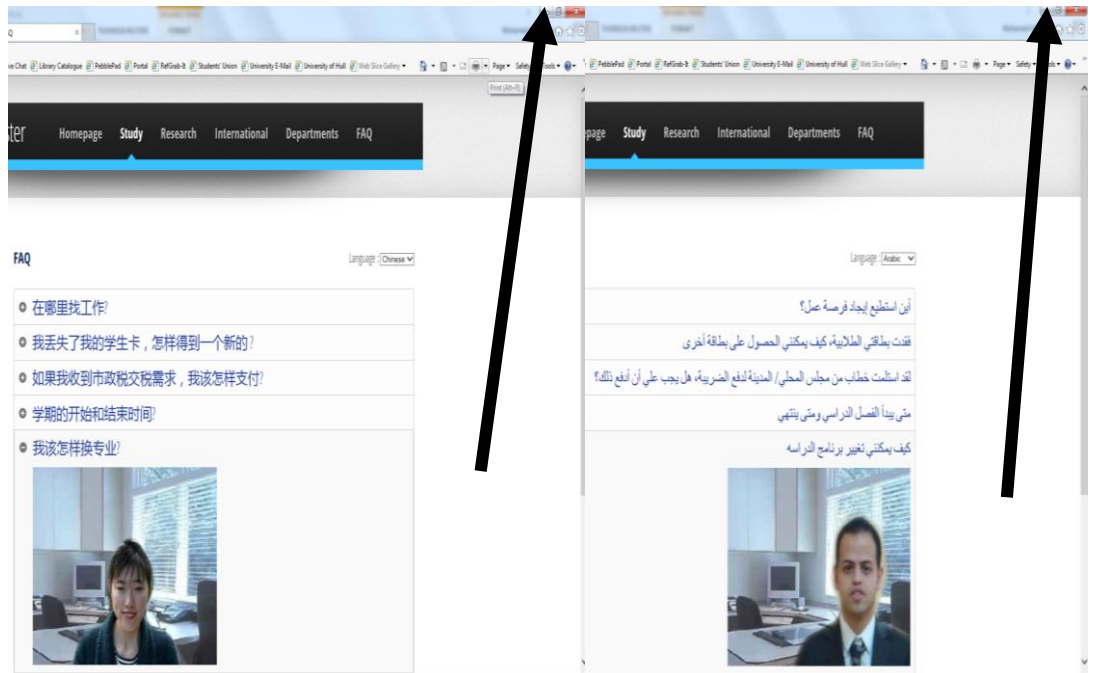
12. Press on the “كيف يمكنني تغيير برنامج الدراسة” or “我该怎样换专业?” question.



13. Place the mouse on the face and press and listen carefully.

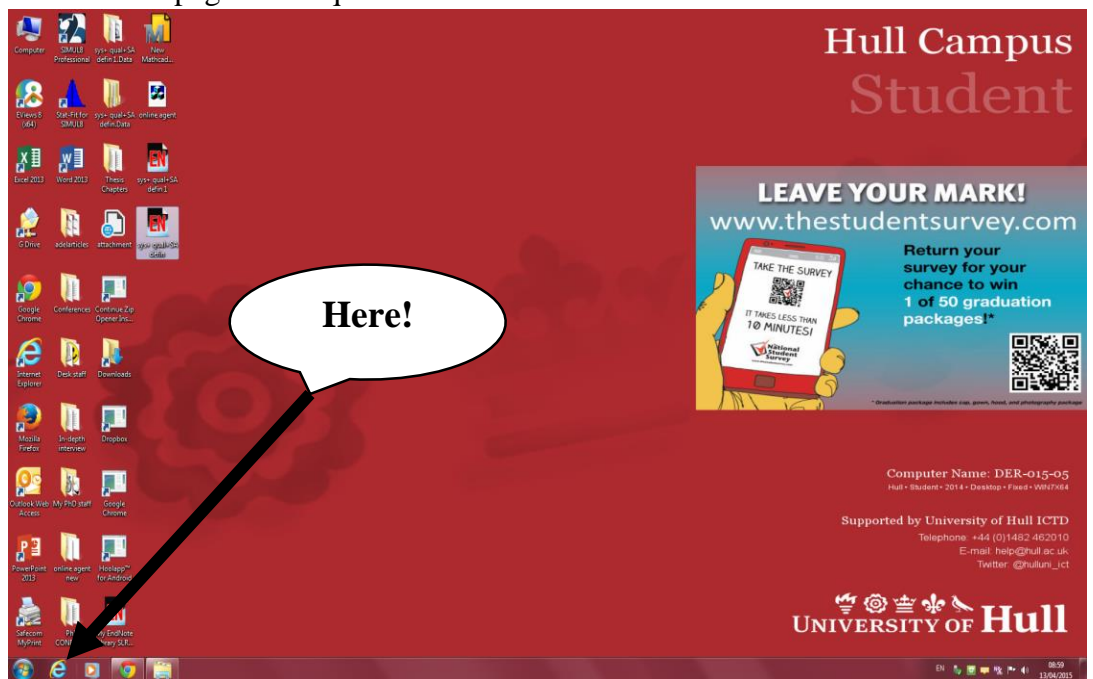


14. Please, minimize the Google chrome window.

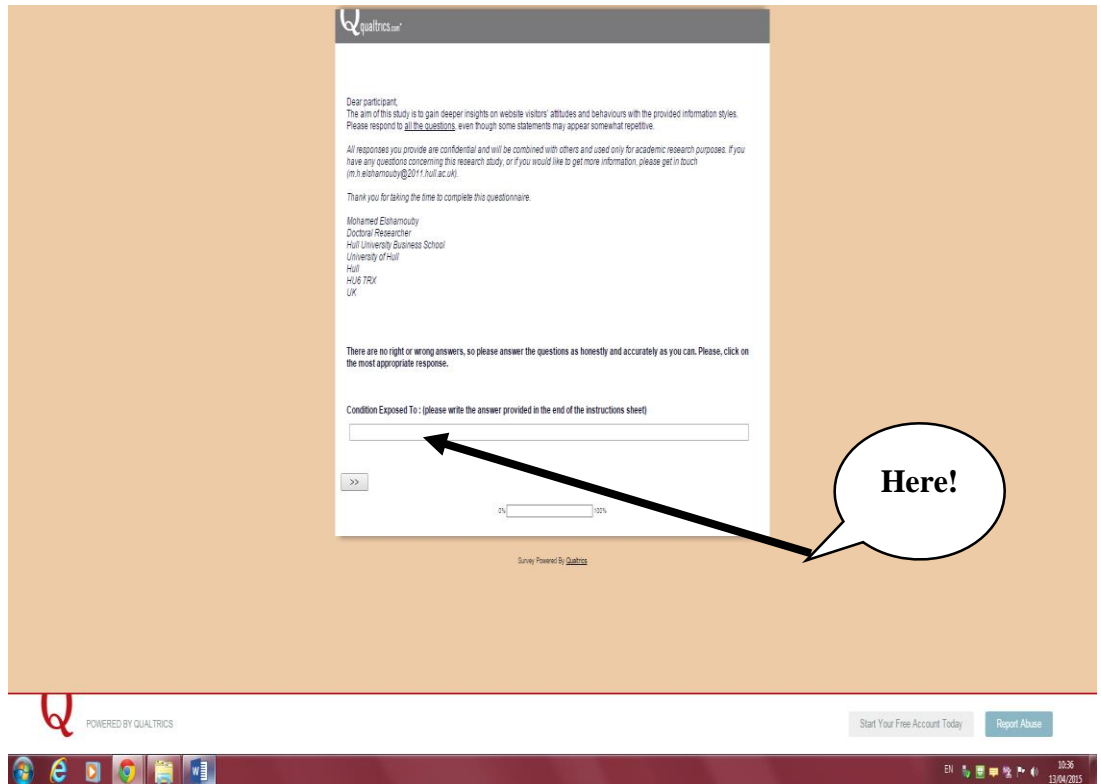


Now,

1. Click on the current **internet explorer** on the bottom bar of the desktop. You will find the first page of the questionnaire.



2. Please write **“admin-avatar with own language”** as the answer of the first question.



3. Please continue to answer all remaining.

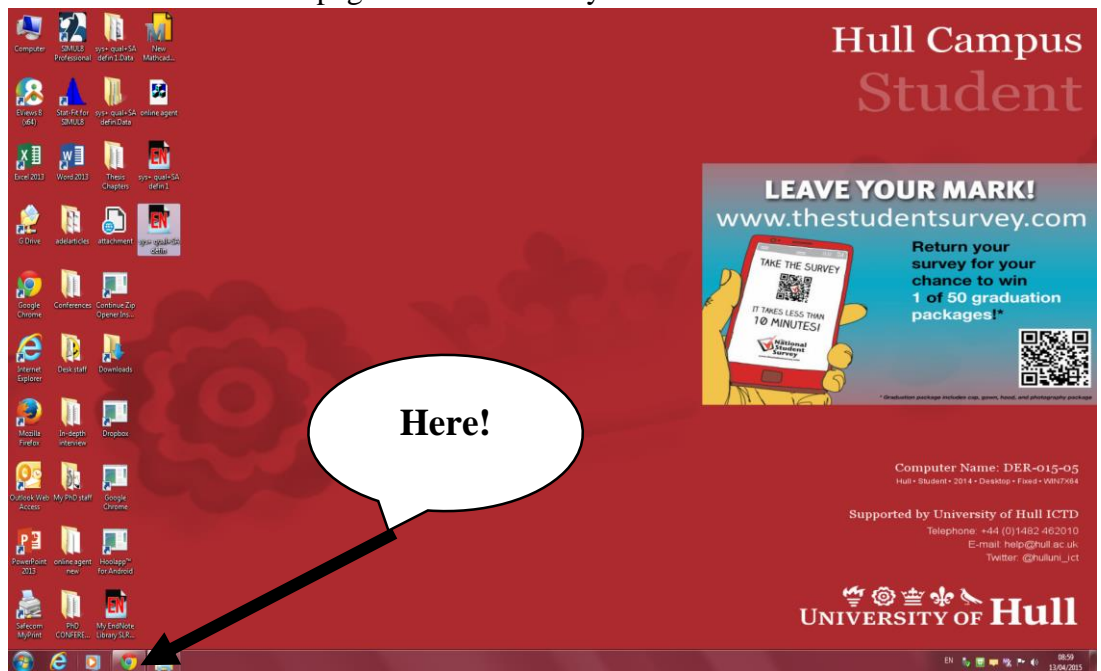
**Many thanks and I really appreciate your effort!**

**Appendix F. 5: Instructions sheet (Study 2):  
Admin-avatar based on text with own language**

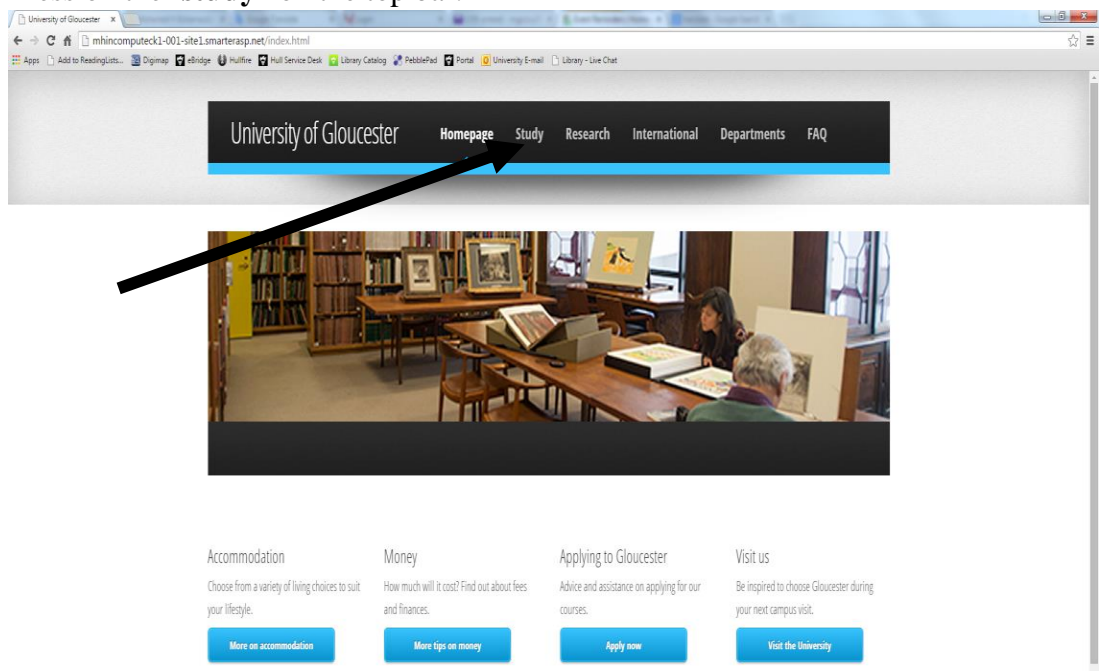
Dear participant,

Imagine that you are applying for (or is a current student at) University of Gloucester. When you browse its website, you will find **an admin-avatar based on text**, a feature on the website giving you website information orally. Moreover, the admin-avatar speaks your own language. To see this feature, **please follow the next instructions:**

1. Press on the current **Google Chrome** on the bottom bar of the desktop. You will be directed to the home page of the University of Gloucester.

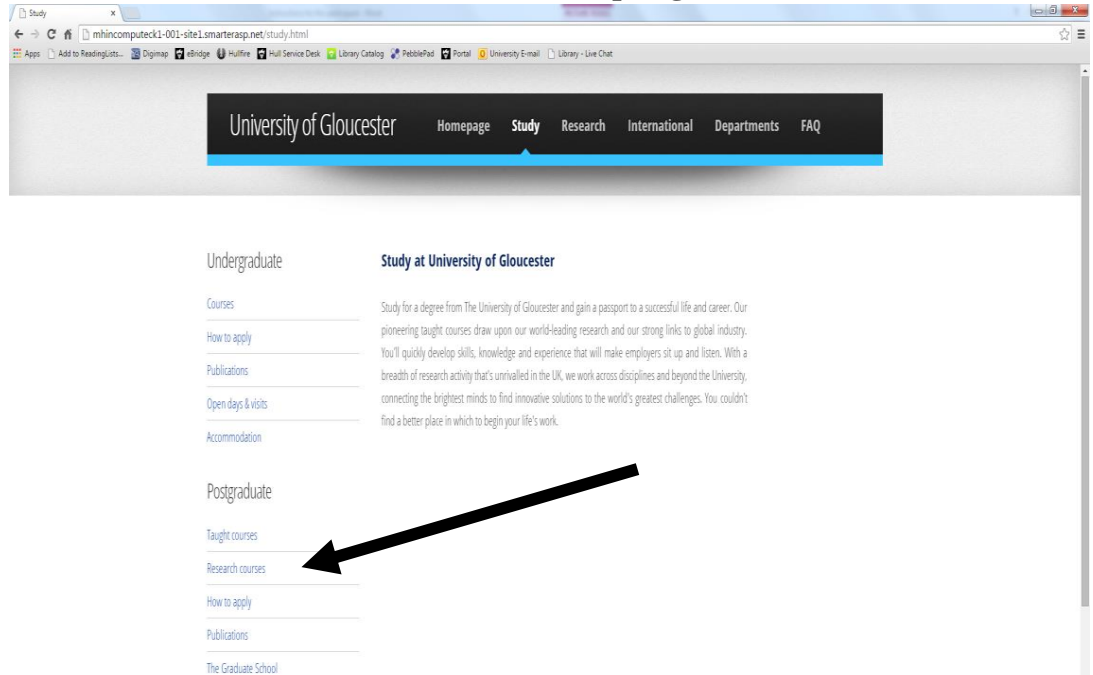


2. Press on the "study" on the top bar.



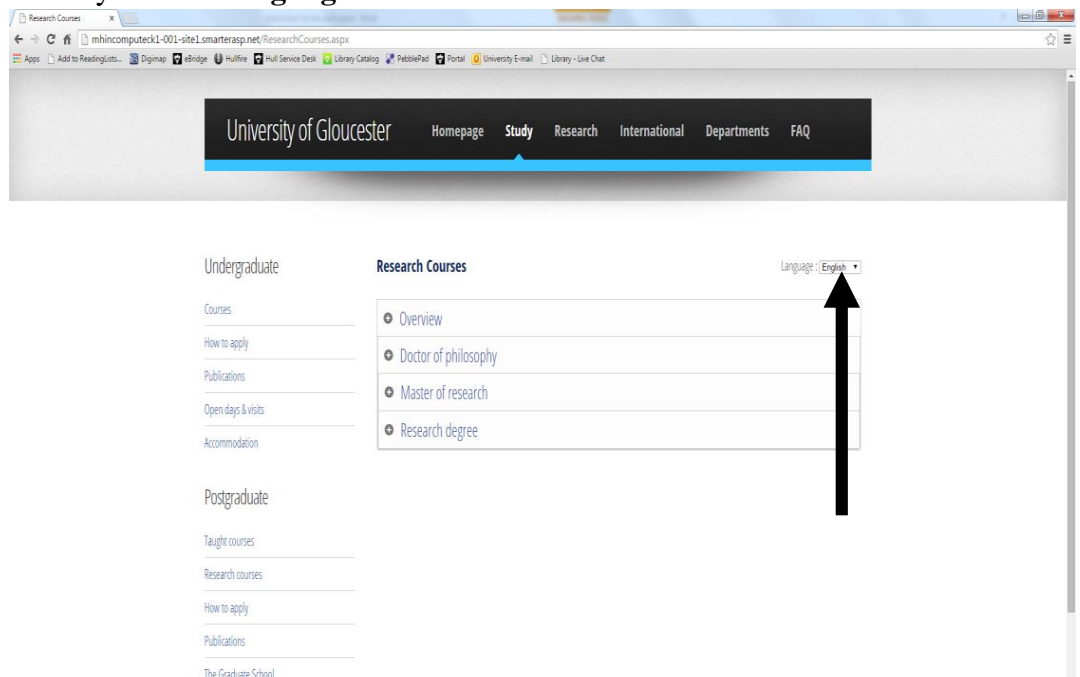


3. Select the “**Research courses**” underneath the **postgraduate** title.

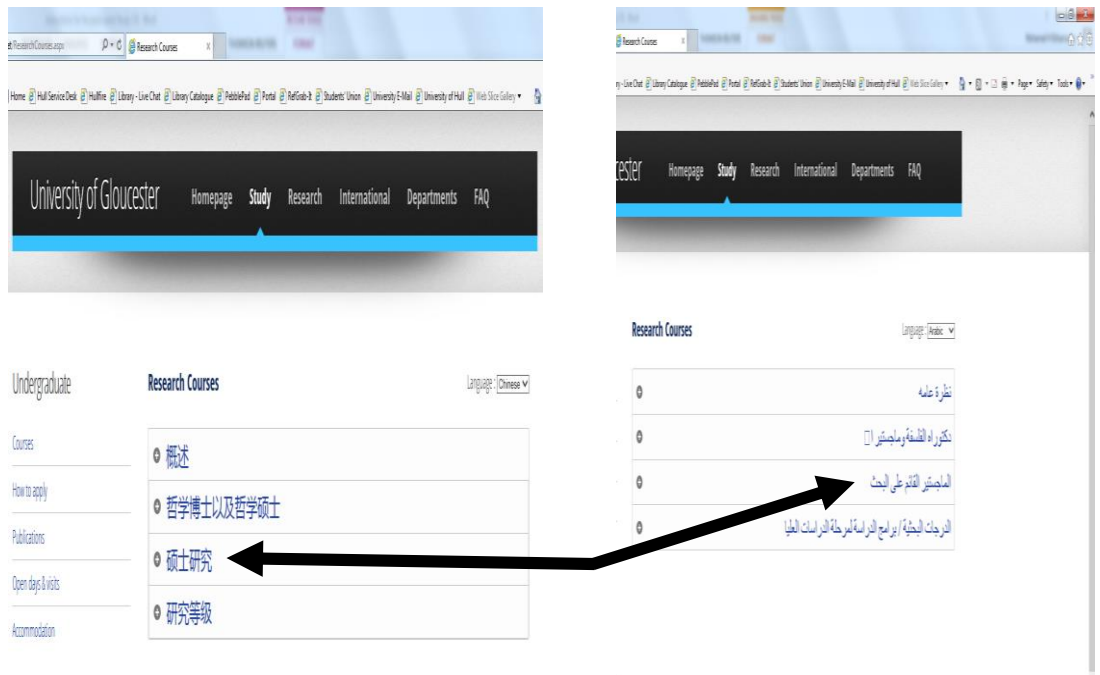


4. Use the “**headset**” to listen the information.

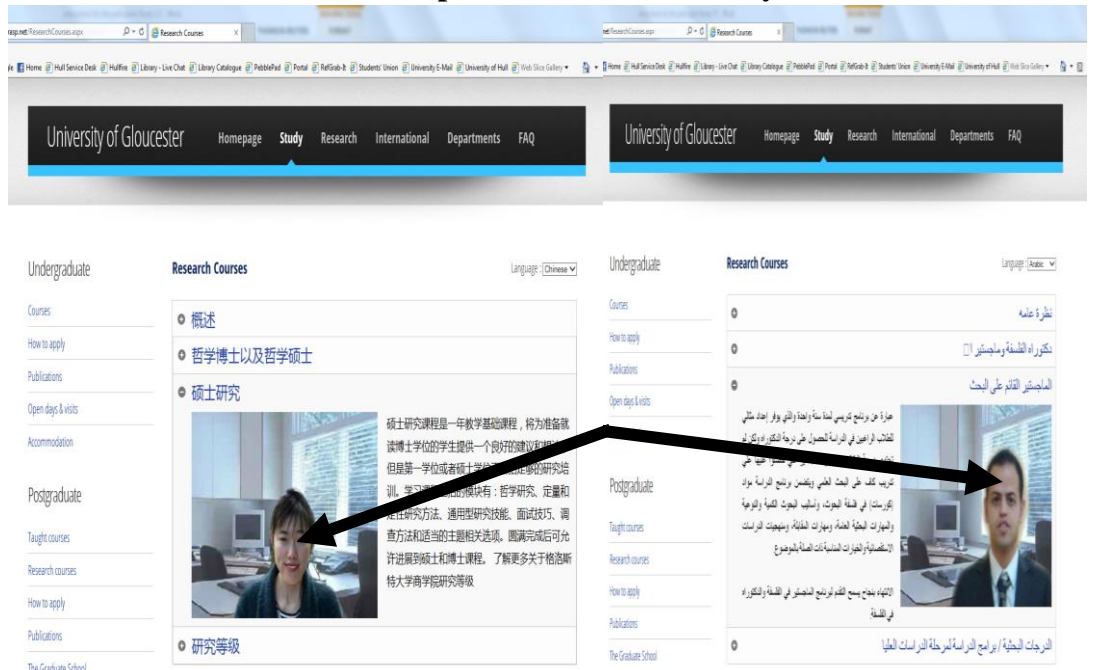
5. Select your **own language Arabic/ Chinese**



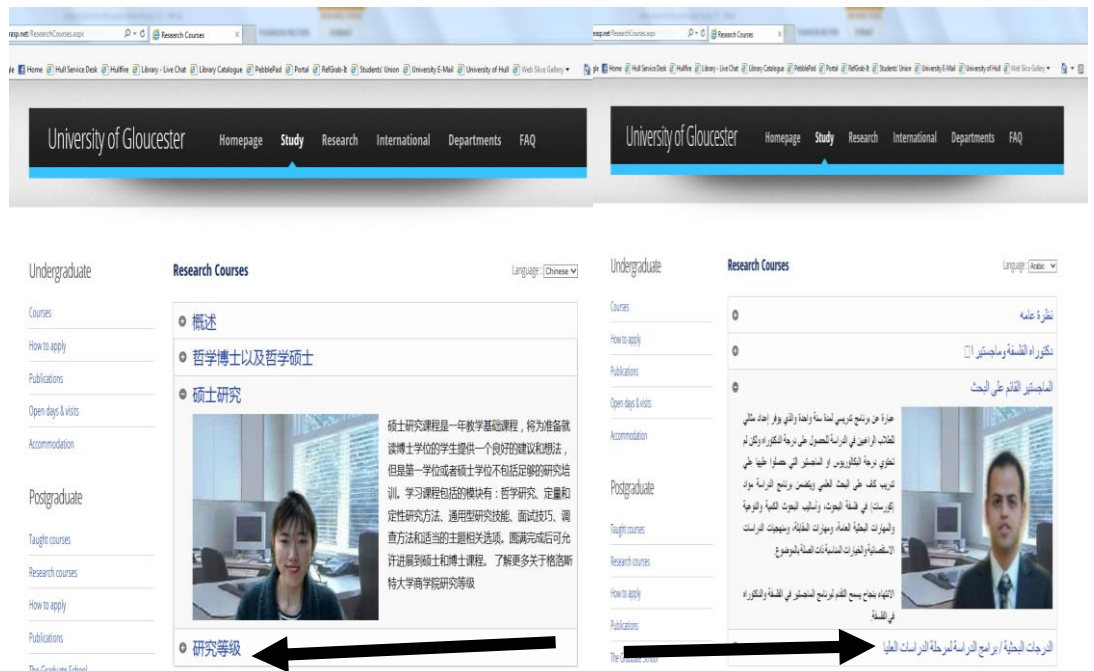
6. Press on “المجستير القائم على البحث” or “硕士研究” hyperlink.



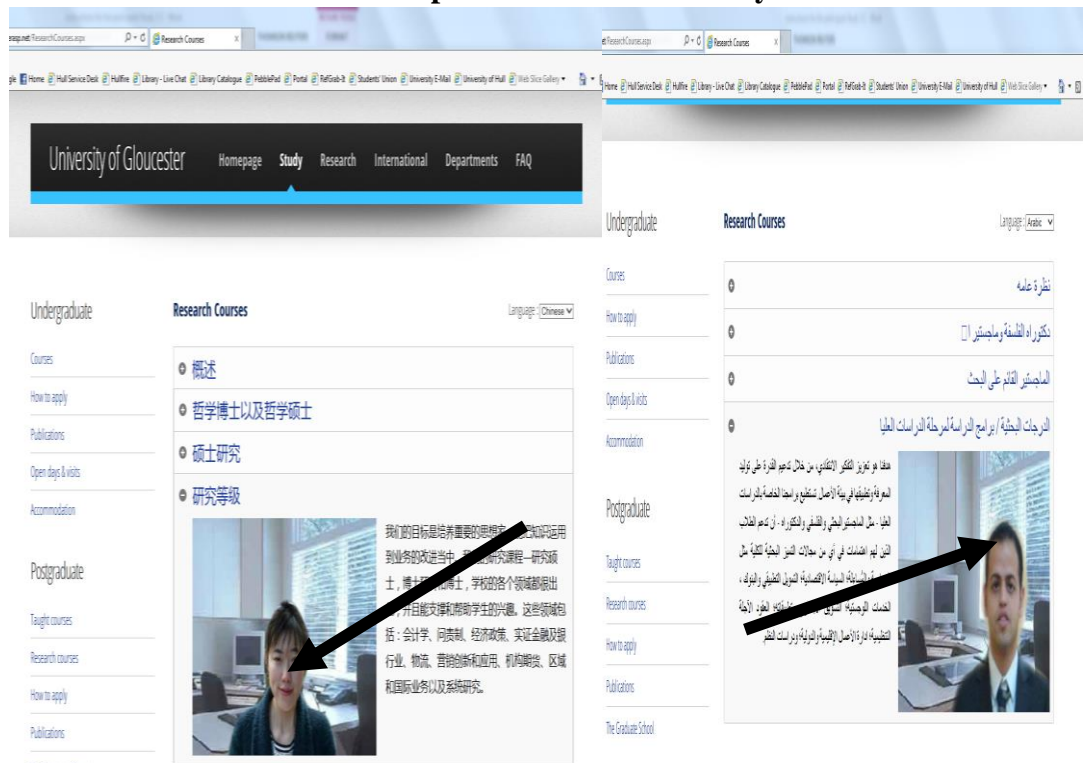
7. Place the mouse on the face and press and listen carefully.



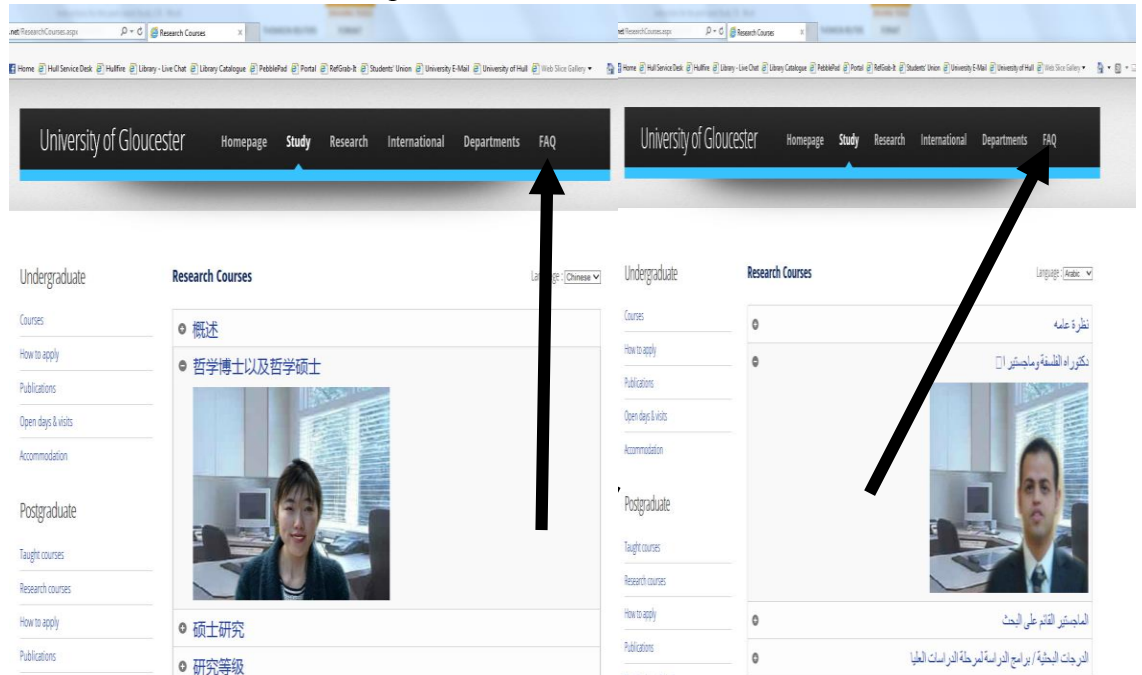
8. Press on “研究等级” “الدرجات البحثية” hyperlink.



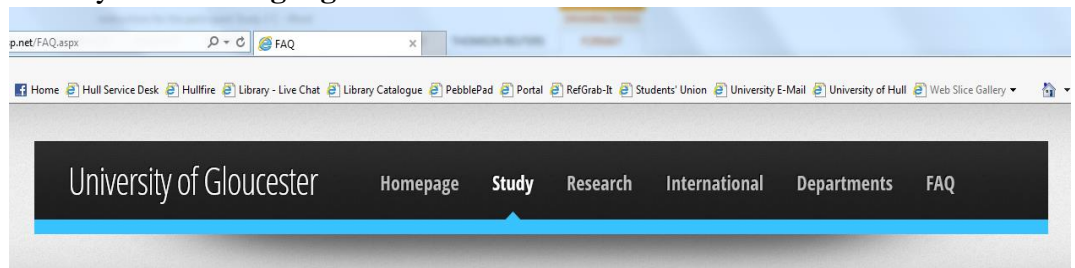
9. Place the mouse on the face and press and listen carefully.



10. Press on “FAQ” on the top bar.



11. Select your own language: Arabic/ Chinese.



Undergraduate

- Courses
- How to apply
- Publications
- Open days & visits
- Accommodation

Postgraduate

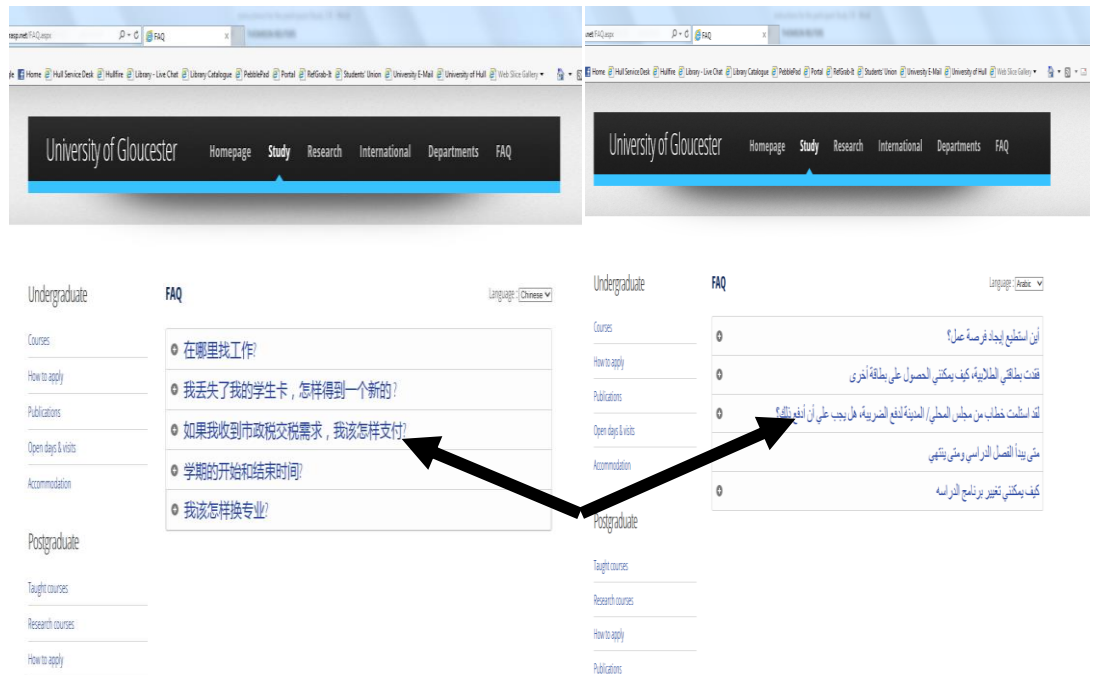
- Taught courses
- Research courses
- How to apply
- Publications
- The Graduate School

FAQ

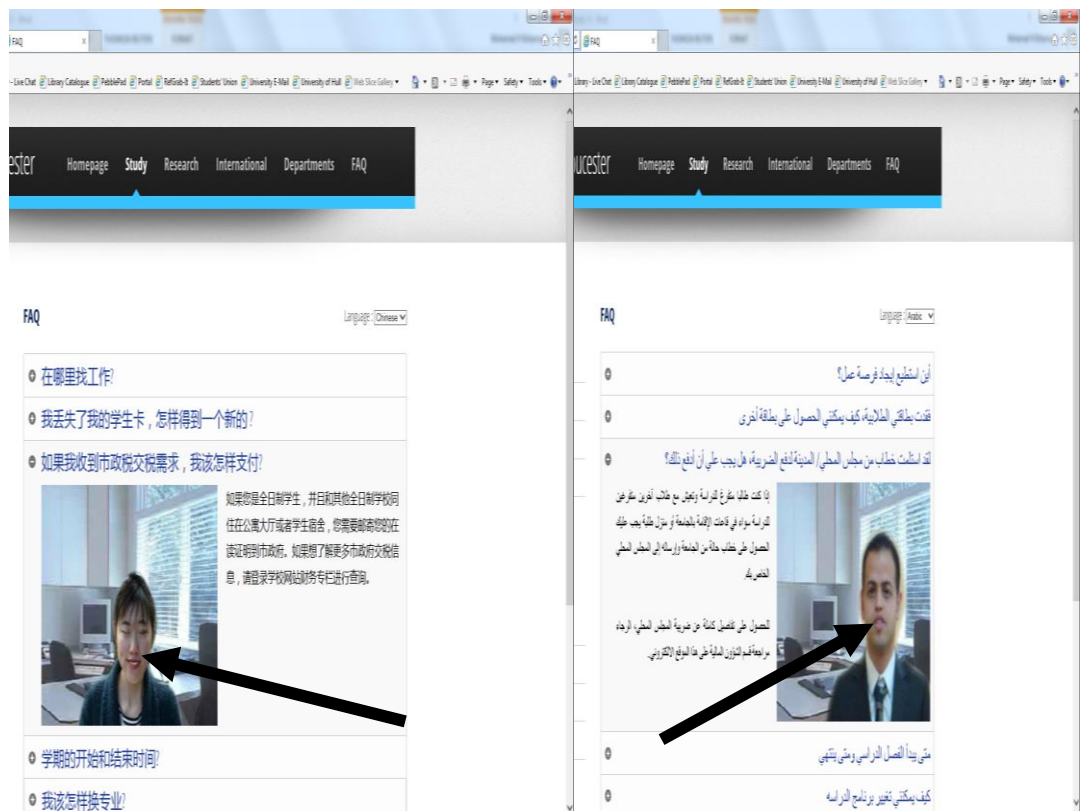
- + Where can I find work?
- + I have lost my Student ID card, how can I get another one?
- + I have received a Council Tax demand, do I have to pay it?
- + When does semester start and end
- + How do I change my programme of study

Language: English

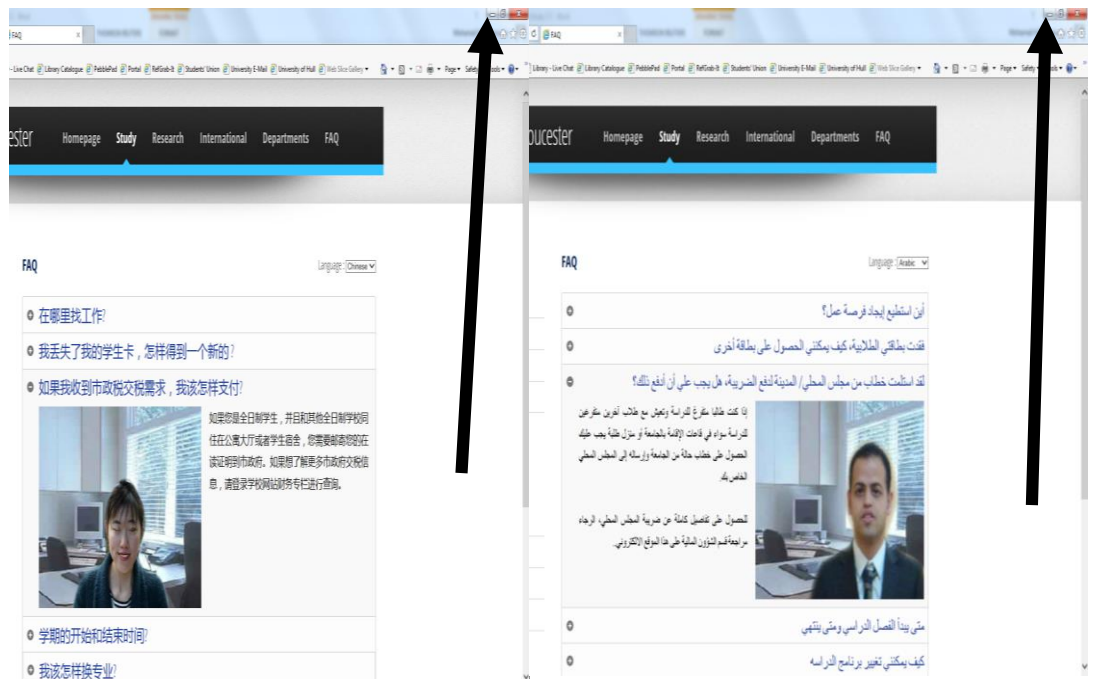
12. Press on the “لقد استلمت خطاب من مجلس المحلي المدينة لدفع الضريبة، هل يجب علي أن أدفع ذلك” or “如果我收到市政税交税需求，我该怎样支付” question.



13. Place the mouse on the face and press and listen carefully.

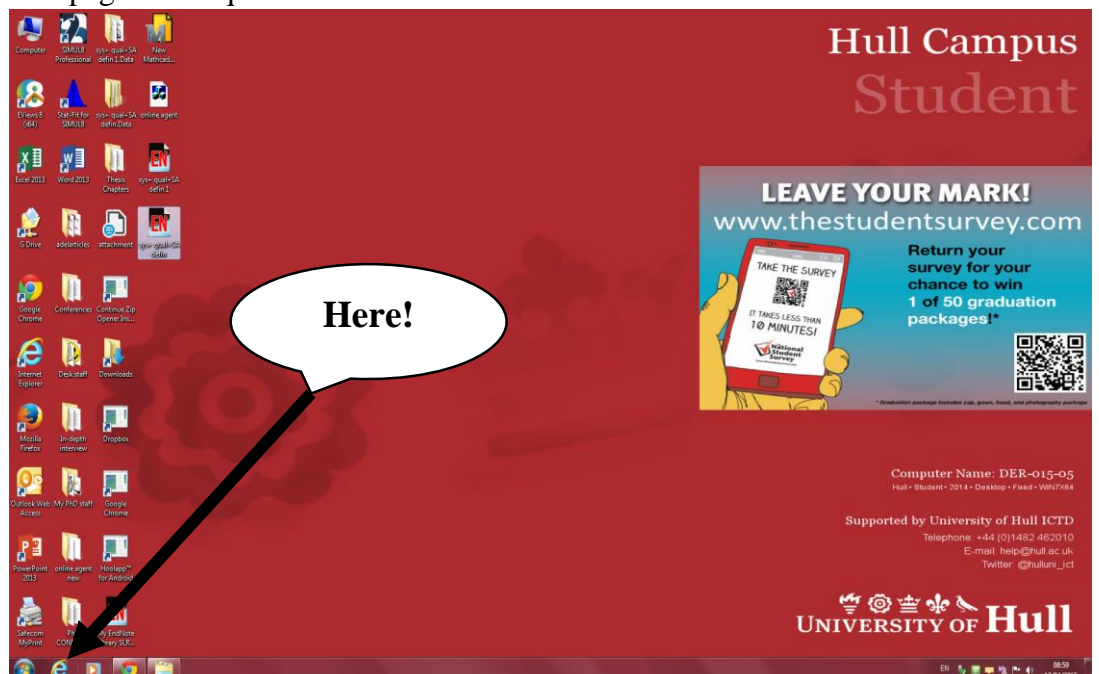


14. Minimize the Google chrome window.

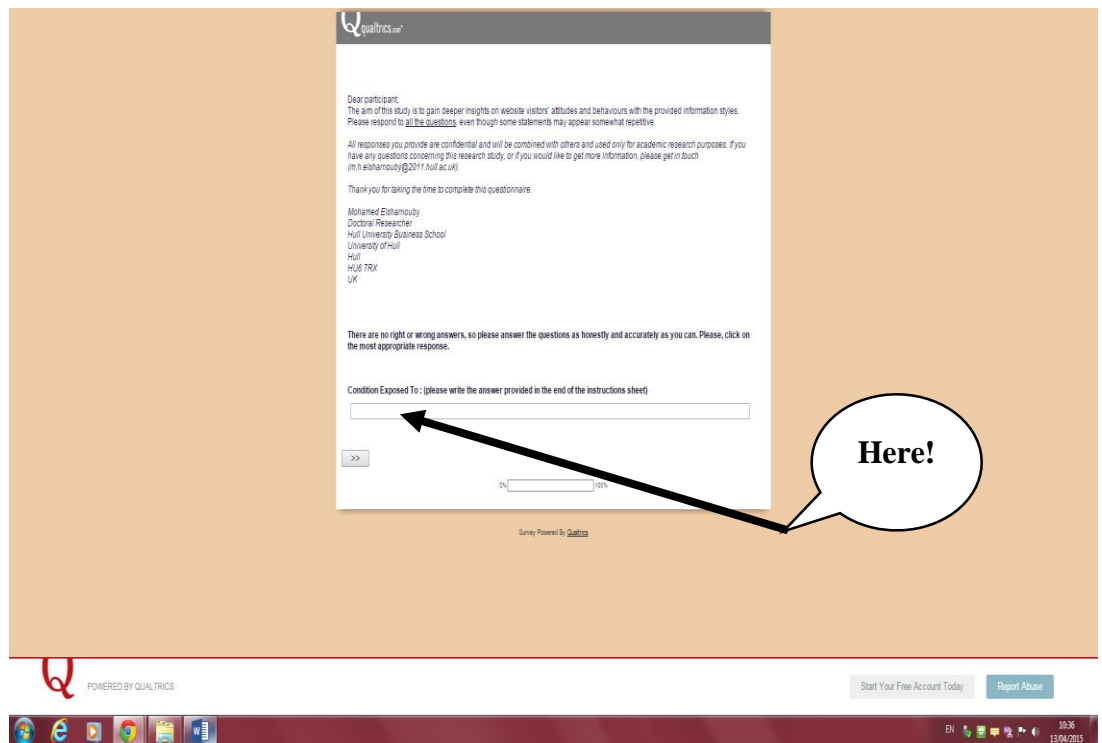


Now,

1. Click on the **internet explorer** on the bottom bar of the desktop. You will find the first page of the questionnaire.



2. Please write **“Admin-avatar based on text in own language”** as the answer of the first question.



3. Please continue to answer all remaining questions.

**Many thanks and I really appreciate your effort!**

## Appendix G: Survey of the experiments

### Appendix G.1: Survey of the experimental study one

**Dear participant,**  
 The aim of this study is to gain deeper insights on website visitors' attitudes and behaviours with the provided information styles. Please respond to all the questions, even though some statements may appear somewhat repetitive.

All responses you provide are confidential and will be combined with others and used only for academic research purposes. If you have any questions concerning this research study, or if you would like to get more information, please get in touch (m.h.elsharnouby@2011.hull.ac.uk).

Thank you for taking the time to complete this questionnaire.

*Mohamed Elsharnouby*  
 Doctoral Researcher  
 Hull University Business School  
 University of Hull  
 Hull  
 HU6 7RX  
 UK

**There are no right or wrong answers, so please answer the questions as honestly and accurately as you can. Please, click on the most appropriate response.**

Condition exposed to: (please write the answer provided in the end of the instructions sheet)

Admin-avatar |

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**I feel about Admin-avatar is**

	1	2	3	4	5	6	7	
not fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	fun
dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	exciting
not delightful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	delightful
not thrilling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	thrilling
unenjoyable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	enjoyable

**The Admin-avatar is:**

Unclear concerning the language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clear concerning the language
Unclear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clear
Unapparent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Apparent
Unclear concerning the organization of information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clear concerning the organization of information
Vague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Well-defined
Not obvious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Obvious
Indistinct	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Distinct

**Adding Admin-avatar to the website makes it:**

	1	2	3	4	5	6	7	
complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not complicated
difficult to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not difficult to use
requires a lot of effort to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Does not require a lot of effort to use.
Please select the middle answer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Please select the middle answer

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**Adding Admin-avatar to the website makes it**

	1	2	3	4	5	6	7	
common	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	distinctive
ordinary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	novel
predictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	surprising
routine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	fresh

**Admin-avatar allows me to control:**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
the speed of getting the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the access to required information from the entire body of information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the provision of information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the search process.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
getting the difficult words to get its meanings ( e.g. from dictionary).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**Please indicate your agreement or disagreement to the following statements:**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
It is easy to deal with the Admin-avatar .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The time required to receive the required information is appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to get to the information from Admin-avatar quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting information from Admin-avatar requires little effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can control admin avatar itself (e.g. through the play, pause and scroll buttons).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Admin-avatar**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
guides me on the website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
answers my queries.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gives me the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
instructs me to get the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
summarizes the information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is convenient for me to get the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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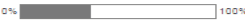
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**Admin-avatar is**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
an effective way to provide information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a competent tool to provide brief information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a competent tool to provide detailed information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a sufficient tool to deliver the information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
an appropriate way to provide this amount of information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a good communication tool for delivering brief information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a good communication tool for delivering detailed information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a good communication tool for delivering all types of information (e.g. words, numbers, links, dates etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a good communication tool for delivering information on all topics of (e.g. financial information, academic programs or courses, timetables, enquires etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
original.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Different from my expectations of other styles .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
memorable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
different.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
likeable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
friendly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
agreeable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you read this item, please select "Strongly Agree" as a response to this question.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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You are over half way there

Please continue as your answers are important to us !

Please, indicate your agreement or disagreement to the following statements:

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
Admin-avatar makes me more receptive to finding out information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Admin-avatar increases my attention when browsing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am attracted to the Admin-avatar because it is like a real person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Admin-avatar is believable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Admin-avatar provides relevant information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Admin-avatar does a good job of presenting the information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following items, please click the appropriate response that best describes your attitude.

Adding the Admin-avatar to the website makes

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
it attractive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it cutting-edge website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it well-designed website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Please indicate the extent to which you agree or disagree with the following statements.

**If I were student at the university of Gloucester.**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
I feel self-worth.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel proud.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel self-respected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that the addition of an Admin-avatar has made it easier to remember the University of Gloucester website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**I can remember the**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
detailed information provided by Admin-avatar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
core information on the topics provided by Admin-avatar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
most information provided by Admin-avatar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
information provided by Admin-avatar easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**I can remember the university of Gloucester because**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
of the Admin-avatar, in the long run.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
of the Admin-avatar, just in the short run.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
of the Admin-avatar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
there is someone talking on its website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>



Hang in there ! You are nearing the finish line

Please, indicate your agreement or disagreement to the following statements:

**If I were applying for/ current a student at University of Gloucester, I feel that the university of Gloucester is:**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
Very good university	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unique	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helpful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technologically developed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adapting new ways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Looking forward to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having paperless work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Modern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**For each item below, please circle the appropriate response that best describes your relationship with the University of Gloucester.**

**If I were applying/ current a student at the university of Gloucester.**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
I would probably think about quitting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would join the University of Gloucester.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would join the University of Gloucester as getting information through the Admin-avatar is easy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would probably look for another source to get the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would probably look for another university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the chance to joining the University of Gloucester is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would join the University of Gloucester because of the presence of the Admin-avatar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Please click the appropriate response that best describes your feelings and opinions.**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
I get mad at myself when I make mistakes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It makes me uneasy to see an error in my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I should be upset if I make a mistake.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Little errors bother me a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>

0%  100%

Survey Powered By Qualtrics

qualtrics.com

**Congratulations! This is the last page!** 🎉

The following information is needed for classification purposes only. Please answer ALL the following items.

**Your gender**

Male  Female

**Your age**

18-25  26-35  36-45  46-55  56-65  66 or more

**Your current degree you are belonging**

Undergraduate  Postgraduate  Other

**Your scientific department (please state)**

**Your country (please state)**

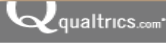
**Your first/ native language (please state)**

Thank you very much for this part of the experiment.

>>

0%  100%

## Appendix G.2: Survey of the experimental study Two

 qualtrics.com

**Dear participant,**  
 The aim of this study is to gain deeper insights on website visitors' attitudes and behaviours with the provided information styles. Please respond to all the questions, even though some statements may appear somewhat repetitive.

All responses you provide are confidential and will be combined with others and used only for academic research purposes. If you have any questions concerning this research study, or if you would like to get more information, please get in touch (m.h.elsharnouby@2011.hull.ac.uk).

Thank you for taking the time to complete this questionnaire.

Mohamed Elsharnouby  
 Doctoral Researcher  
 Hull University Business School  
 University of Hull  
 Hull  
 HU6 7RX  
 UK


**There are no right or wrong answers, so please answer the questions as honestly and accurately as you can. Please, click on the most appropriate response.**

Condition Exposed To : (please write the answer provided in the end of the instructions sheet)

Admin-avatar based on text in own language

>>

Survey Completion 0% 100%

Survey Powered By  Qualtrics

 qualtrics.com

**Admin-avatar based on text in own language**

	1	2	3	4	5	6	7	
Does not looks like a person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Looks like a person
Does not seem as if it has intentions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Seems as if it has intentions.
Does not seems almost as if it has free will.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Seems almost as if it has free will.
Moves rigidly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Moves elegantly

**The Admin-avatar based on text in own language is**

	1	2	3	4	5	6	7	
vague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	well-defined
not obvious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	obvious
Unclear concerning the organization of information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clear concerning the organization of information
indistinct	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	distinct
unapparent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	apparent
Unclear concerning the accent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clear concerning the accent
unclear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	clear
Unclear concerning the language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clear concerning the language

For each item below, please click the most appropriate response.

**By browsing the Admin-avatar based on text in own language**

	1	2	3	4	5	6	7	
it is very unfamiliar to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	it is very familiar to me.
I'm not at all knowledgeable about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I'm very knowledgeable about it.
I have never seen it on the website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I have seen many of it on the websites.
Select the middle answer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Select the middle answer

**I feel about Admin-avatar based on text in own language that it is**

	1	2	3	4	5	6	7	
unenjoyable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	enjoyable
not delightful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	delightful
dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	exciting
not thrilling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	thrilling
not fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	fun

>>

Survey Completion 0% 100%



**Adding Admin-avatar based on text in own language to the website makes it:**

	1	2	3	4	5	6	7	
difficult to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not difficult to use
requires a lot of effort to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Does not require a lot of effort to use.
complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not complicated

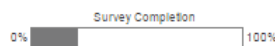
For each item below, please click the most appropriate response.

**After using Admin-avatar based on text in own language,**

	1	2	3	4	5	6	7	
Interaction with it is like face to face.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not a lot like face to face at all
Interaction with it makes me feel like I were in the same place with real person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not like being in the same place at all.
I am not likely to choose it for persuading me to get required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very likely
I feel I could get to know someone very well that I met only through it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not at all
I am able to form distinct impressions of the it .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not at all
Web-based it communication is an excellent medium for social interaction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not at all
I feel that there is limited interaction with the website because it is programmed with specific information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not at all
I feel that adding an it on the website increases the direct contact with the university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not at all
Choose the middle answer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	choose the middle answer

**An Admin-avatar based on text in own language on the website makes it**

	1	2	3	4	5	6	7	
common	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	distinctive
ordinary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	novel
predictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	surprising
routine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	fresh





**Admin-avatar based on text in own language allows me to control:**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
the access to required information from the entire body of information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the speed of getting the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the search process.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
getting the difficult words to get its meanings ( e.g. from dictionary).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the provision of information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Please, indicate your agreement or disagreement to the following statements:**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
It is easy to deal with the Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Admin-avatar based on text in own language is convenient for me to get the required information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would not take much time to get the information from Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The time required to receive the required information is appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to get to the information from Admin-avatar based on text in own language quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting information from Admin-avatar based on text in own language requires little effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can control Admin-avatar based on text in own language itself (e.g. through the play, pause and scroll buttons).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you read this item, please select "Strongly Agree" as a response to this question.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>



You are over half way there

Please continue as your answers are important to us !

**Admin-avatar based on text in own language is.**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
Original.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Different from my expectations of other styles (e.g. text).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memorable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Different.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
likeable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
friendly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
agreeable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Once you have done this, indicate your agreement or disagreement to the following statements:

**Admin-avatar based on text in own language :**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
makes me more receptive to finding out information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increases my attention when browsing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
attracts me because it is like a real person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is a sufficient/ adequate to navigate the website so that required information is required.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gives me all the information I need.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is believable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
provides relevant information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
does a good job of presenting the information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>



For the following items, please click the appropriate response that best describes your attitude and opinions about the university of Gloucester.

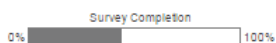
**Adding the Admin-avatar based on text in own language to the website makes.**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
it more accessible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it attractive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it cutting-edge website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it well-designed website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**I can remember the**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
core information on the topics provided by Admin-avatar based on text in own language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Gloucester website because of adding the Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
information provided by Admin-avatar based on text in own language through taking notes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
detailed information provided by Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
most information provided by Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
information provided by Admin-avatar based on text in own language easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>







Please indicate the extent to which you agree or disagree with the following statements.

**I can remember the university of Gloucester because**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Dissagree	Slightly Agree	Agree	Strongly Agree
its Admin-avatar based on text in own language has distinctive body language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
its Admin-avatar based on text in own language has a distinctive face.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
of the Admin-avatar based on text in own language, in the long run.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
of the Admin-avatar based on text in own language, just in the short run.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
of the Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
there is someone talking on it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please, indicate your agreement or disagreement to the following statements:

**If I were a student at University of Gloucester, I feel that the university of Gloucester is:**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
Unique	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very good university	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helpful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technologically developed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adapting new ways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Looking forward to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having paper less work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Modern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, I would recommend others to join the University of Gloucester	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>





Hang in there ! You are nearing the finish line

In general, I would recommend others to join the University of Gloucester:

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
because of the presence of the Admin-avatar based on text in own language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it helps the search process strategies to its students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please, indicate your agreement or disagreement to the following statements:

	Strongly Dissagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
I would give feedback to the university on Admin-avatar based on text in own language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend others to visit the University of Gloucester website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If my friends were looking for university, I would tell them to visit the University of Gloucester website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>



Please click the appropriate response that best describes your feelings and opinions about the University of Gloucester.

I would give feedback to the university on Admin-avatar based on text in own language.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
only if they provide feedback section in easy way (e.g. multiple choice questions).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
only if they motivate me to do so.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
only if they provide section for that on the website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

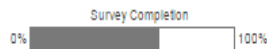
Indicate the likelihood of you doing the following, soon after receiving information about the University of Gloucester:

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
say positive things about the University of Gloucester to other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
speaking positively of the University of Gloucester to people close to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
encourage friends and relatives to visit the University of Gloucester website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please click the appropriate response that best describes yourself.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
It makes me uneasy to see an error in my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I should be upset if I make a mistake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get mad at myself when I make mistakes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Little errors bother me a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>



Please click the appropriate response that best describes your feelings and opinions about the University of Gloucester.

I would give feedback to the university on Admin-avatar based on text in own language.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
only if they provide feedback section in easy way (e.g. multiple choice questions).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
only if they motivate me to do so.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
only if they provide section for that on the website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Indicate the likelihood of you doing the following, soon after receiving information about the University of Gloucester:

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Agree	Strongly Agree
say positive things about the University of Gloucester to other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
speak positively of the University of Gloucester to people close to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
encourage friends and relatives to visit the University of Gloucester website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please click the appropriate response that best describes yourself.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
It makes me uneasy to see an error in my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I should be upset if I make a mistake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get mad at myself when I make mistakes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Little errors bother me a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**Congratulations! This is the last page!** 🙌

The following information is needed for classification purposes only. Please answer ALL the following items.

**Your gender**

Male  Female

**Your age**

18-25  36-45  56-65  
 26-35  46-55  66 or more

**Your current degree you are belonging**

Undergraduate  Postgraduate  other

**Your scientific department (please state)**

**Your country (please state)**

**Your first/ native language (please state)**

Thank you very much for your help with the survey.

>>

Survey Completion

**Appendix H: Assessment of normality via Kolmogorov-Smirnov and Shapiro-Wilk**

**Appendix H. 1 Assessment of normality via Kolmogorov-Smirnov and Shapiro-Wilk  
(Experimental study one)**

Items	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
HED1	.137	111	.000	.936	111	.000
HED2	.145	111	.000	.943	111	.000
HED3	.126	111	.000	.948	111	.000
HED4	.158	111	.000	.942	111	.000
HED5	.154	111	.000	.934	111	.000
CLA1	.213	111	.000	.876	111	.000
CLA2	.227	111	.000	.876	111	.000
CLA3	.205	111	.000	.884	111	.000
CLA4	.188	111	.000	.889	111	.000
CLA5	.223	111	.000	.892	111	.000
CLA6	.225	111	.000	.885	111	.000
CLA7	.176	111	.000	.891	111	.000
EOUW1	.219	111	.000	.846	111	.000
EOUW2	.221	111	.000	.821	111	.000
EOUW3	.231	111	.000	.808	111	.000
ITU1	.173	111	.000	.884	111	.000
ITU2	.179	111	.000	.910	111	.000
ITU3	.232	111	.000	.865	111	.000
NOVW1	.166	111	.000	.874	111	.000
NOVW2	.164	111	.000	.904	111	.000
NOVW3	.141	111	.000	.914	111	.000
NOVW4	.182	111	.000	.880	111	.000
CONTR1	.219	111	.000	.886	111	.000
CONTR2	.132	111	.000	.918	111	.000
CONTR3	.216	111	.000	.903	111	.000
CONTR4	.239	111	.000	.887	111	.000
CONTR5	.204	111	.000	.905	111	.000
CONV1	.318	111	.000	.794	111	.000
CONV2	.262	111	.000	.844	111	.000
CONV3	.275	111	.000	.836	111	.000
CONV4	.235	111	.000	.849	111	.000
CONTR6	.201	111	.000	.862	111	.000
ASSIS1	.201	111	.000	.880	111	.000
ASSIS2	.272	111	.000	.766	111	.000
ASSIS3	.301	111	.000	.752	111	.000
ASSIS4	.257	111	.000	.812	111	.000
ASSIS5	.252	111	.000	.710	111	.000
CONV5	.242	111	.000	.843	111	.000
COMPT1	.242	111	.000	.863	111	.000
COMPT2	.248	111	.000	.866	111	.000
COMPT3	.181	111	.000	.917	111	.000
COMPT4	.227	111	.000	.886	111	.000
COMPT5	.276	111	.000	.862	111	.000
COMMU1	.251	111	.000	.856	111	.000
COMMU2	.195	111	.000	.910	111	.000
COMMU3	.184	111	.000	.907	111	.000

COMMU4	.197	111	.000	.910	111	.000
NOV1	.152	111	.000	.930	111	.000
NOV2	.176	111	.000	.892	111	.000
NOV3	.191	111	.000	.908	111	.000
NOV4	.170	111	.000	.902	111	.000
LIK1	.170	111	.000	.921	111	.000
LIK2	.196	111	.000	.909	111	.000
LIK3	.201	111	.000	.907	111	.000
ATTR1	.196	111	.000	.895	111	.000
ATTR2	.225	111	.000	.879	111	.000
ATTR3	.232	111	.000	.883	111	.000
USEF1	.227	111	.000	.893	111	.000
USEF2	.234	111	.000	.871	111	.000
USEF3	.265	111	.000	.839	111	.000
ATTRW1	.218	111	.000	.887	111	.000
ATTRW2	.171	111	.000	.923	111	.000
ATTRW3	.237	111	.000	.874	111	.000
PRI1	.202	111	.000	.909	111	.000
PRI2	.212	111	.000	.893	111	.000
PRI3	.218	111	.000	.917	111	.000
RECU1	.160	111	.000	.922	111	.000
RECI1	.244	111	.000	.908	111	.000
RECI2	.247	111	.000	.848	111	.000
RECI3	.215	111	.000	.908	111	.000
RECI4	.222	111	.000	.882	111	.000
RECU2	.150	111	.000	.934	111	.000
RECU3	.205	111	.000	.925	111	.000
RECU4	.200	111	.000	.906	111	.000
RECU5	.209	111	.000	.871	111	.000
ATT_U_G1	.203	111	.000	.895	111	.000
ATT_U_G2	.153	111	.000	.944	111	.000
ATT_U_G3	.152	111	.000	.938	111	.000
ATT_U_G4	.157	111	.000	.923	111	.000
ATT_U_G5	.195	111	.000	.913	111	.000
ATT_U_G6	.152	111	.000	.923	111	.000
ATT_U_M1	.193	111	.000	.892	111	.000
ATT_U_M2	.193	111	.000	.885	111	.000
ATT_U_M3	.192	111	.000	.909	111	.000
ATT_U_M4	.177	111	.000	.905	111	.000
ATT_U_M5	.194	111	.000	.912	111	.000
ATT_U_M6	.198	111	.000	.894	111	.000
TEND1	.252	111	.000	.914	111	.000
TEND2	.174	111	.000	.935	111	.000
TEND3	.249	111	.000	.868	111	.000
PTJ1	.222	111	.000	.918	111	.000
PTJ2	.163	111	.000	.905	111	.000
PTJ3	.216	111	.000	.933	111	.000
PTJ4	.144	111	.000	.941	111	.000

**Appendix H. 2: Assessment of Normality via Kolmogorov-Smirnov and Shapiro-Wilk  
(Experimental study two)**

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ANTHR1	.175	135	.000	.918	135	.000
ANTHR2	.152	135	.000	.943	135	.000
ANTHR3	.176	135	.000	.923	135	.000
ANTHR4	.149	135	.000	.941	135	.000
CLAR1	.207	135	.000	.888	135	.000
CLAR2	.212	135	.000	.879	135	.000
CLAR3	.213	135	.000	.864	135	.000
CLAR4	.235	135	.000	.873	135	.000
CLAR5	.228	135	.000	.800	135	.000
CLAR6	.253	135	.000	.783	135	.000
CLAR7	.266	135	.000	.805	135	.000
CLAR8	.255	135	.000	.849	135	.000
FAMI1	.153	135	.000	.936	135	.000
FAMI2	.135	135	.000	.943	135	.000
FAMI3	.259	135	.000	.818	135	.000
HED1	.174	135	.000	.928	135	.000
HED2	.148	135	.000	.936	135	.000
HED3	.151	135	.000	.936	135	.000
HED4	.147	135	.000	.945	135	.000
HED5	.188	135	.000	.923	135	.000
EOUW1	.270	135	.000	.801	135	.000
EOUW2	.242	135	.000	.812	135	.000
EOUW3	.246	135	.000	.817	135	.000
SP1	.152	135	.000	.943	135	.000
SP2	.164	135	.000	.927	135	.000
SP3	.125	135	.000	.939	135	.000
SP4	.159	135	.000	.932	135	.000
SP5	.169	135	.000	.932	135	.000
SP6	.169	135	.000	.928	135	.000
SP7	.163	135	.000	.924	135	.000
SP8	.193	135	.000	.911	135	.000
NOVW1	.203	135	.000	.918	135	.000
NOVW2	.169	135	.000	.941	135	.000
NOVW3	.156	135	.000	.935	135	.000
NOVW4	.188	135	.000	.905	135	.000
CONTR1	.229	135	.000	.871	135	.000
CONTR2	.177	135	.000	.915	135	.000
CONTR3	.208	135	.000	.896	135	.000

CONTR4	.232	135	.000	.868	135	.000
CONTR5	.192	135	.000	.898	135	.000
CONV1	.324	135	.000	.798	135	.000
CONV2	.260	135	.000	.846	135	.000
CONV3	.258	135	.000	.849	135	.000
CONV4	.265	135	.000	.847	135	.000
CONV5	.277	135	.000	.847	135	.000
CONV6	.246	135	.000	.868	135	.000
CONTR6	.223	135	.000	.896	135	.000
NOV1	.251	135	.000	.871	135	.000
NOV2	.234	135	.000	.880	135	.000
NOV3	.245	135	.000	.871	135	.000
NOV4	.281	135	.000	.844	135	.000
LIK1	.246	135	.000	.883	135	.000
LIK2	.229	135	.000	.877	135	.000
LIK3	.261	135	.000	.853	135	.000
ATTRC1	.245	135	.000	.869	135	.000
ATTRC2	.206	135	.000	.882	135	.000
ATTRC3	.207	135	.000	.914	135	.000
INFOR1	.182	135	.000	.910	135	.000
INFOR2	.201	135	.000	.914	135	.000
USEF1	.234	135	.000	.881	135	.000
USEF2	.271	135	.000	.840	135	.000
USEF3	.278	135	.000	.837	135	.000
ATTRCW1	.222	135	.000	.877	135	.000
ATTRCW2	.190	135	.000	.895	135	.000
ATTRCW3	.238	135	.000	.871	135	.000
REC1	.234	135	.000	.859	135	.000
RECU1	.296	135	.000	.851	135	.000
REC2	.218	135	.000	.880	135	.000
REC3	.226	135	.000	.896	135	.000
REC4	.204	135	.000	.896	135	.000
REC5	.214	135	.000	.876	135	.000
RECU2	.177	135	.000	.933	135	.000
RECU3	.226	135	.000	.903	135	.000
RECU4	.187	135	.000	.914	135	.000
RECU5	.175	135	.000	.928	135	.000
RECU6	.228	135	.000	.874	135	.000
RECU7	.229	135	.000	.857	135	.000
ATT_U_G1	.175	135	.000	.912	135	.000
ATT_U_G2	.200	135	.000	.888	135	.000
ATT_U_G3	.153	135	.000	.921	135	.000



ATT_U_G4	.187	135	.000	.890	135	.000
ATT_U_G5	.232	135	.000	.842	135	.000
ATT_U_G6	.240	135	.000	.859	135	.000
ATT_U_M1	.273	135	.000	.833	135	.000
ATT_U_M2	.259	135	.000	.812	135	.000
ATT_U_M3	.238	135	.000	.850	135	.000
ATT_U_M4	.240	135	.000	.851	135	.000
ATT_U_M5	.180	135	.000	.908	135	.000
ATT_U_M6	.245	135	.000	.864	135	.000
RECOM1	.197	135	.000	.907	135	.000
RECOM2	.170	135	.000	.928	135	.000
RECOM3	.183	135	.000	.903	135	.000
GFB1	.204	135	.000	.902	135	.000
RECOM4	.219	135	.000	.888	135	.000
RECOM5	.198	135	.000	.903	135	.000
GFB2	.225	135	.000	.858	135	.000
GFB3	.249	135	.000	.847	135	.000
GFB4	.209	135	.000	.893	135	.000
WOM1	.207	135	.000	.902	135	.000
WOM2	.153	135	.000	.924	135	.000
WOM3	.167	135	.000	.923	135	.000

Appendix I: Common method bias

Appendix I.1: Item Loadings for five Factors CFA Model – Coefficients, Standard Errors and C.R.-values

Factor and Indicators		Estimate		S.E.	C.R.	P
		Unstandardised	Standardised			
<b>Clarity</b>						
CLA1	The {condition name} is:-Unclear concerning the language	.840	.820	.065	12.975	***
CLA2	The {condition name} is:-Unclear	.951	.943	.049	19.486	***
CLA4	The {condition name} is:-Unclear concerning the organization of information	.909	.852	.064	14.249	***
CLA3	The {condition name} is:-Unapparent	1.000	.944			
<b>Control</b>						
CONTR1	The {condition name} allows me to control:-the provision of information.	.972	.770	.107	9.120	***
CONTR5	The {condition name} allows me to control:-the search process.	1.155	.828	.115	10.033	***
CONTR3	The {condition name} allows me to control:-the access to required information from the entire body of information.	1.000	.850			
<b>Assistance</b>						
ASSIS4	The {condition name}-instructs me to get the required information.	1.000	.789			
ASSIS2	The {condition name}-answers my queries.	1.210	.904	.164	7.399	***
<b>Competence</b>						
COMPT5	The {condition name} is -an appropriate way to provide this amount of information.	1.000	.863			
COMPT2	The {condition name} is -a competent tool to provide brief information.	.671	.674	.087	7.740	***
COMPT4	{Condition name} is -a sufficient tool to deliver the information.	.995	.782	.105	9.517	***
<b>Convenience</b>						
CONV4	Getting information from {condition name} requires little effort.	.919	.659	.113	8.134	***
CONV3	I am able to get to the information from {condition name} quickly.	1.038	.902	.074	13.932	***
CONV2	The time required to receive the required information is appropriate.	1.000	.925			
<b>Communication</b>						
COMMU2	{Condition name} is a good communication tool for delivering detailed information.	.858	.813	.096	8.946	***
COMMU3	{Condition name} is a good communication tool for delivering all types of information (e.g. words, numbers, links, dates etc.).	1.000	.923			

\*\*\* Probability < .001

**Appendix I. 2 Item Loadings for five Factors CFA Model – Coefficients, Standard Errors and C.R.-values  
(Consequences related to the website: Experimental study one)**

Factor and Indicators		Estimate		S.E.	C.R.	P
		Unstandardised	Standardised			
<b>Attitude toward the website</b>						
ATTRAC	Second order construct	1.000	.973			***
NOVL		1.032	.870	.090	11.453	***
LIK		.936	.922	.070	13.408	***
<b>Attractiveness</b>						
ATTRW1	Adding { condition } makes it attractive.	1.000	.930			***
ATTR3	I am attracted to the {condition} because it is like a real person.	1.052	.840	.082	12.821	***
<b>Likeability</b>						
LIK1	{condition} is -likeable	1.000	.948			***
LIK2	{condition} is -friendly	.888	.896	.057	15.484	***
<b>Novelty</b>						
NOVW2	Adding { condition } to the website makes it –ordinary... novel	.998	.941	.060	16.756	***
NOVW3	Adding { condition } to the website makes it –predictable..... surprising	1.000	.928			***
NOV1	{Condition} is -original.	.507	.554	.078	6.510	***
<b>Recall information</b>						
RECI1	I can remember the-detailed information provided by {condition }.	1.000	.902			***
RECI3	I can remember the-most information provided by {condition}.	1.041	.925	.066	15.792	***
RECI4	I can remember the information provided by {condition} easily.	1.073	.942	.065	16.527	***
<b>Hedonism</b>						
HED1	I feel about {condition} is-dull: exciting	1.000	.890			***
HED2	I feel about {condition} is-not delightful..... delightful	.908	.927	.060	15.031	***
HED3	I feel about {condition} is-not fun: fun	.954	.910	.066	14.457	***
<b>Usefulness</b>						
USEF1	{condition }; is believable	1.245	.863	.170	7.309	***
USEF2	{condition} provides relevant information.	1.000	.742			***
<b>Ease of use website</b>						
EOUW1	Adding {condition} to the website makes it:-complicated....	1.090	.958	.095	11.471	***
EOUW2	Adding {condition} to the website makes it:-difficult to use.....	1.000	.883			***

\*\*\* Probability < .000

**Appendix I. 3 Item Loadings for five Factors CFA Model – Coefficients, Standard Errors and C.R.-values  
(Consequences related to the brand: experimental study one)**

Factor and Indicators		Estimate		S.E.	C.R.	P
		Unstandardised	Standardised			
Attitude toward the brand						
ATT_U_G	Second order construct	1.000	.986			***
ATT_U_M		1.225	.862	.131	9.341	***
RECU		1.540	.920	.161	9.590	***
Recall the brand						
RECU1	I feel that the addition of an {condition} has made it easier to remember the University of Gloucester website.	1.000	.904			***
RECU2	I can remember the university of Gloucester because -of the {condition}, in the long run.	.945	.804	.089	10.655	***
RECU3	I can remember the university of Gloucester because -of the {condition}, just in the short run.	.554	.482	.105	5.255	***
Attitude toward brand (modernity)						
ATT_U_M1	Technologically developed	1.140	.954	.056	20.389	***
ATT_U_M3	Looking forward to change	1.033	.897	.063	16.360	***
ATT_U_M4	Innovative	1.158	.966	.054	21.479	***
ATT_U_M6	Modern	1.000	.931			***
Attitude toward brand (Image)						
ATT_U_G1	Very good university	1.000	.800			***
ATT_U_G3	Attractive	1.367	.927	.118	11.595	***
ATT_U_G5	Helpful	1.036	.744	.120	8.623	***
Pride						
PRI1	I feel proud.	1.000	.940			***
PRI3	I feel self-worth.	.872	.891	.066	13.260	***
Potential to join						
PTJ1	I would join the University of Gloucester.	.984	.899	.157	6.266	***
PTJ2	I would join the University of Gloucester as getting information through the {condition} is easy.	1.000	.651			***
Tendency to leave						
TEND1	I would probably look for another university.	1.000				***
TEND2	I would probably look for another source to get the required information.	.489	.406	.127	3.852	***
TEND3	I would probably think about quitting.	.537	.614	.104	5.160	***

**Appendix I. 4 Item Loadings for five Factors CFA Model – Coefficients, Standard Errors and C.R.-values (antecedents and moderator: Experimental study two)**

Factor and Indicators	Estimate		S.E.	C.R.	P
	Unstandardised	Standardised			
<b>Anthropomorphism</b>					
<b>ANTHR2</b> {Condition name} does not seems almost as if it has free will..... Seems almost as if it has free will.	1.088	.793	.160	6.791	***
<b>ANTHR3</b> {Condition name} does not seem as if it has intentions.....Seems as if it has intentions.	1.037	.723	.156	6.665	***
<b>ANTHR4</b> {Condition name} moves rigidly..... Moves elegantly	1.000	.674			***
<b>Clarity</b>					
<b>CLAR3</b> The {condition} is not obvious..... obvious	.943	.672	.140	6.718	***
<b>CLAR5</b> The {Condition name} is unclear..... clear	1.208	.881	.150	8.036	***
<b>CLAR7</b> The {Condition name} is unclear concerning the accent.... Clear concerning the accent	.877	.597	.144	6.078	***
<b>CLAR8</b> The {Condition name} is unclear concerning the organization of information.... Clear concerning the organization of information	1.000	.680			***
<b>Control</b>					
<b>CONTR 1</b> {Condition name} allows me to control the provision of information.	.673	.621	.095	7.096	***
<b>CONTR 4</b> {Condition name} allows me to control the speed of getting the required information.	.983	.767	.112	8.764	***
<b>CONTR 5</b> {Condition name} allows me to control the search process.	1.000	.869			***
<b>Familiarity</b>					
<b>FAMIL1</b> By browsing the {Condition name}, it is very unfamiliar to me..... it is very familiar to me.	1.000	.775			***
<b>FAMIL2</b> By browsing the {Condition name}, I not at all knowledgeable about it..... I'm very knowledgeable about it.	.864	.679	.146	5.899	***
<b>FAMIL3</b> By browsing the {Condition name}, I have never seen it on the website..... I have seen many of it on the websites.	1.011	.696	.168	6.034	***
<b>Convenience</b>					
<b>CONV3</b> It would not take much time to get the information from {Condition name}	.798	.629	.111	7.173	***
<b>CONV4</b> The time required to receive the required information is appropriate.	.945	.861	.094	10.105	***
<b>CONV5</b> I am able to get to the information from {Condition name} quickly.	1.000	.823			***

\*\*\* Probability < .001

**Appendix I. 5 Item Loadings for five Factors CFA Model – Coefficients, Standard Errors and C.R.-values (consequences related to the website)**

Factor and Indicators		Estimate		S.E.	C.R.	P
		Unstandardised	Standardised			
<b>Attitude toward the website</b>						
ATTRAC		1.564	.916	.391	4.004	***
NOVL	Second order construct	1.000	.625			***
LIK		1.759	.928	.436	4.038	***
<b>Attractiveness</b>						
ATTRW2	Adding {condition name} to the website makes it attractive.	1.000	.687			***
ATTR2	Adding {condition name} increases my attention when browsing.	1.019	.665	.158	6.447	***
ATTRCW3		1.132	.754	.151	7.507	
<b>Likeability</b>						
LIK1	{condition name} is -likeable	1.116	.873	.101	11.006	***
LIK3	{condition name} is -agreeable	1.000	.831			***
<b>Novelty</b>						
NOVW3	Adding {condition name} to the website makes it –predictable..... surprising	1.000	.614			***
NOV1	Adding {condition name} to the website makes it –routine..... fresh	1.045	.613	.283	3.691	***
<b>Recall information</b>						
RECI3	I can remember the-detailed information provided by {condition name}.	1.000	.917			***
RECI4	I can remember the-most information provided by {condition name}.	.840	.798	.074	11.403	***
RECI5	I can remember the -information provided by {condition name} easily.	.809	.804	.073	11.017	
<b>Hedonic</b>						
HED2	I feel about {condition name} is dull..... exciting	1.000	.925			***
HED3	I feel about {condition name} is not delightful..... delightful	.890	.900	.052	17.012	***
HED5	I feel about {condition name} that it is unenjoyable..... enjoyable	.938	.909	.055	17.159	***
<b>Usefulness</b>						
USEF2	{condition name} provides relevant information.	.786	.755	.108	7.254	***
USEF3	{Condition name} does a good job of presenting the information.	1.000	.842			***
<b>Ease of use website</b>						
EOUW2	Adding {Condition name} to the website makes it difficult to use..... not difficult to use	1.000	.746			***
EOUW1	Adding {condition name} to the website makes it:-complicated.... not complicated	1.319	.887	.273	4.822	***
<b>Social presence</b>						
SP1	After using {Condition name}, interaction with it is like face to face..... Not a lot like face to face at all	.984	.841	.170	5.793	***

SP2	After using {Condition name}, interaction with it makes me feel like I were in the same place with real person... Not like being in the same place at all.	1.000	.822	***
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\*\*\* Probability < .001

**Appendix I. 6 Item Loadings for five Factors CFA Model – Coefficients, Standard Errors and C.R.-values (consequences related to the brand)**

Factor and Indicators		Estimate		S.E.	C.R.	P
		Unstandardised	Standardised			
<b>Attitude toward the brand</b>						
ATT_U_G		1.000	.927			***
ATT_U_M	Second order construct	.891	.862	.097	9.219	***
RECU		.452	.927	.083	5.417	***
<b>Recall the brand</b>						
RECU1	I can remember the University of Gloucester website because of adding {condition name}.	1.000	.537			***
RECU4	I can remember the university of Gloucester because of the {condition name}, in the long run.	1.443	.530	.324	4.454	***
<b>Attitude toward brand (modernity)</b>						
ATT_U_M1	Technologically developed	1.000	.912			
ATT_U_M3	Looking forward to change	.914	.823	.082	11.194	***
<b>Attitude toward brand (image)</b>						
ATT_U_G3	Attractive	.996	.898	.074	13.543	***
ATT_U_G2	Unique	.944	.803	.091	10.288	***
ATT_U_G1	Very good university	1.000	.854	.086	10.975	***
<b>Recommendation</b>						
RECOM2	In general, I would recommend others to join the University of Gloucester because the presence of the {condition name}.	1.000	.776			***
RECOM3	In general, I would recommend others to join the University of Gloucester because it helps the search process strategies to its students.	1.084	.886	.119	9.104	***
<b>Word of Mouth</b>						
WOM1	Say positive things about the University of Gloucester to other people.	1.000	.904			***
WOM2	Speak positively of the University of Gloucester to people close to me.	1.113	.918	.080	13.973	***
<b>Feedback</b>						
GFB2	I would give feedback to the university on {condition name}, only if they provide section for that on the website.	1.212	.787	.191	6.346	***
GFB3	I would give feedback to the university on {condition name}, only if they provide feedback section in easy way (e.g. multiple choice questions).	1.153	.770	.179	6.459	***
GFB4	I would give feedback to the university on {condition name}, only if they motivate me to do so.	1.000	.639			***