



**A Case Study of Collaborative Learning among  
Preparatory Year Students and their Teachers at Hail  
University in Saudi Arabia**

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by

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## ABSTRACT

The concept of collaborative learning (CL) relates to the educational use of small groups, in which students work together to maximise their learning and to teach and learn from each other as much as possible, after receiving guidelines and instructions from their teachers. Collaborative learning in Saudi higher education (SHE) has been promoted at the government level in recent years as part of a trend to increase the adoption of e-learning. The policy also aligns with educational reforms and the drive to make the Saudi economy more competitive and diverse. Nevertheless, it is still enforcing itself to become a norm in the teaching and learning process as it is a radical shift from the traditional centralised decision making in educational settings and teacher-centred teaching, which indicate a high power distance structure. Therefore, this study investigates the perceptions of preparatory year students and teachers at Hail University regarding the implementation of CL. A qualitative research methodology was adopted. Data were gathered from observations, six focus groups (composed of five students in each group) and individual interviews with 12 teachers on the foundation year. The findings of this study indicated two modalities for deploying CL: traditional CL (TCL/non-computer-supported collaborative learning [CSCL]) and computer-supported CL (CSCL) in Saudi higher Education. Furthermore, the results showed that CL indeed provides personal, social, and academic benefits. It is still, however, marred by challenges such that effective implementation is curtailed and thus does not produce positive learning outcomes among students. Overall, given the cultural background, the preference for retaining a high power distance, and what teachers and students are accustomed to, the study suggests further research be conducted to implement an form of CL adapted to suit Saudi culture.

**Keywords:** Collaborative Learning (CL), Computer-Supported Collaborative Learning (CSCL), Traditional Collaborative Learning (Non-CSCL), Saudi Higher Education (SHE).

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## ABBREVIATIONS

CAI	Computer Aided Instruction
CBL	Computer-Based Learning
CL	Collaborative Learning (superset of TCL and CSCL)
CLT	Cognitive Load Theory
CSCL	Computer-Supported Collaborative Learning
ECL	Extraneous Cognitive Load
F2F	Face-to-Face
GCL	Germane Cognitive Load
GDPR	General Data Protection Regulation
GOTEVOT	General Organisation for Technical Education and Vocational Training (KSA)
GPA	Grade Point Average
HE	Higher Education
ICL	Intrinsic Cognitive Load
ICT	Information and Communications Technology
IT	Information Technology
KACST	King Abdul Aziz City of Science and Technology (Saudi Arabia)
KSA	Kingdom of Saudi Arabia
LCMS	Learning Content Management System
LMS	Learning Management System
MIE	Minimal Invasive Education
MOE	Ministry of Education (Saudi Arabia)
MOHE	Ministry of Higher Education (Saudi Arabia)
NCEL	National Centre for E-Learning and Distance Education (Saudi Arabia)
non-CSCL	Collaborative Learning (without the aid of a computer)
pbuh	Peace Be Upon Him
PC	Personal Computer
PLATO	Programmed Logic for Automated Teaching Operations
SM	Social Media
SNAPP	Social Networks Advancing Pedagogical Practice
SRRL	Socially Shared Regulation of Learning
TAM	Technology Acceptance Model
TCL	Traditional Collaborative Learning (Non-CSCL)
UTAUT	Unified Theory of Acceptance and Use of Technology
VLE	Virtual Learning Environment

## CHAPTER 1 - INTRODUCTION

---

### 1.1 Context and Scope

Collaborative learning (CL) is the central focus of this study, particularly computer-supported collaborative learning (CSCL), which is examined in depth and compared with traditional collaborative learning (TCL). CL involves learning interactively and collaboratively with other learners, which often leads to reaching a consensus in gaining knowledge. Hmelo-Silver et al. (2013) gave a detailed historical account of the modern origins and development of this form of learning stemming from developmental psychology. This origination in modern times is examined in 3.2. Although the importance of collaborative learning, the opportunities it presents, and the rationale for choosing to study this phenomenon are covered in 4.2, as pointed out by Ali et al. (2003), it is not the only important dimension of learning priorities. Other important dimensions are accessing information, critical thinking, problem solving, and decision making. Collaborative learning is nonetheless an important dimension to focus on, and which CSCL tools have the potential to support. The rationale for this study is covered in more detail in this introductory chapter, and collaborative learning is examined in depth in the literature review based on past and current studies in Chapter 4.

Apart from the context of CL using a CSCL tool, the other contextual variable is the sociocultural and educational environment of Saudi Arabia, specifically that of [the kingdom's Higher Education \(HE\)](#) institutions. In addition, as the subsequent two subsections show, culture is an important factor affecting how well CL can occur and how a CSCL tool is used for collaborative learning. Smith and Aboummoh (2013) gave a detailed overview of the Saudi education sector and considered why it had not produced many knowledge workers. This knowledge-based orientation is important for the kingdom. Patalong's (2016) report highlights the kingdom's new '2030 Vision', which aims to transition the country's economy to a more knowledge-based economy. It may be that CSCL tool-based collaborative learning can play an important part in this regard. This is covered in Chapter 2 to provide a general overview of the context and is examined further in 4.5.6 as a contextual factor that can either facilitate or hinder collaborative learning among learners.

### 1.2 Problem Statement

It was observed at the researcher's previous university, namely the University of Hail (UOHail), in the Kingdom of Saudi Arabia (KSA), that the extent of usage of the university's CSCL arrangement differs considerably between departments. It is only used in those departments for which the

university has made it compulsory and, where it is optional, departments choose not to use it. It may be that even among those departments that do use it, they are not using it effectively to support teaching in a way that would show its potential and encourage other departments that are not using it to start applying it. Consequently, this may be affecting the extent of collaboration between students through using CSCL tools.

Investigating this phenomenon may uncover a host of underlying reasons why the university faculty either do not use their university's CSCL tools or are perhaps not using them effectively, including technical, pedagogical, attitudinal, or cultural issues. However, the study's goal is to use this information to find ways of ensuring a CSCL tool is used effectively, particularly in terms of improving pedagogical delivery for teachers and improving collaboration among students. Ultimately, the study may make a useful contribution to making more effective use of CSCL tools in ways that promote effective student collaboration and accelerating their usefulness in the [kingdom](#), and e-learning generally, in enhancing learning.

### **1.3 The Researcher**

The researcher of this study, Fauwaz Alali, is a Saudi national and thus well acquainted with Saudi culture. He was appointed as a lecturer at Hail University, at which the study was conducted. He is employed in the Educational Technology Department in its School of Education. More details of the researcher are found in the methodology chapter under 'positionality'. The data were collected in his native language of Arabic and then translated into English for reporting and analysis. The researcher is interested in utilising educational technologies to support students' learning, particularly promoting CSCL practices. Despite the position of the researcher disclosed above, the study was conducted neutrally, impartially, and objectively, as would have been done by an independent researcher.

### **1.4 Background and Motivation**

Section 4.2 in the literature review chapter briefly covers some key opportunities and challenges for collaborative learning. The information summarised in Table 6 could be useful when recommending ways to enhance collaborative learning within the Saudi Arabian cultural context. Various studies attempt to explain, for instance, why frustration can occur (Capdeferro & Romero, 2012), highlight the importance of skills for making collaborative learning effective (Naykki et al., 2014), as well as other factors such as knowledge and motivation (Sherblom et al., 2013). Moreover, Zhu's (2011) study examined the important role of the cultural environment, which has been taken on board in this study, as mentioned earlier, as covered for instance in 4.3.1 and 4.5.6. Further insight may also be gained from such studies as that by Rimor et al. (2010), which investigated interaction patterns while

students were collaborating. In short, the examination of these studies has laid the foundation for exploring ways of enhancing collaborative learning.

## **1.5 Aim, Objectives and Research Questions**

### **1.5.1 Aim, main objective and research question**

This study investigates the deployment, perceptions and experiences of students and teachers of collaborative learning. This was achieved by ascertaining how collaborative learning is deployed at a selected institution, exploring and examining the perceptions of students and teachers, investigating their experiences in learning collaboratively, and investigating the factors that facilitate or hinder collaborative learning. Given this aim of the study and as reflected in its title, the main objective and research question to guide the research are the following:

Main objective (ObjM): *To investigate how collaborative learning is deployed, perceived, and experienced by a sample of students and their teachers to support their learning and teaching in the preparatory year at Hail University.*

Main research question (RQM): *How is collaborative learning deployed, perceived, and experienced by a sample of students and their teachers to support their learning and teaching in the preparatory year at Hail University?*

### **1.5.2 Sub-objectives and research questions**

To help achieve the main objective and research question, the following sub-objectives and sub-RQs were devised (Table 1):

**Table 1: Sub-objectives and research questions in this study**

Sub-Objective	Sub-Research Question
ObjS1: To ascertain how collaborative learning is deployed and practised in the Preparatory Year of Hail University.	RQS1: How is collaborative learning deployed and practised in the Preparatory Year of Hail University?
ObjS2: To explore the perceptions of students and teachers at Hail University towards collaborative learning with and without the use of CSCL tools.	RQS2: What are the <i>perceptions</i> of students and teachers at Hail University towards collaborative learning with and without the use of CSCL tools?
ObjS3: To investigate the experiences of those students and teachers at Hail University who use CSCL tools for collaborative learning.	RQS3: What are the experiences of those students and teachers at Hail University who use CSCL tools for collaborative learning?
ObjS4: To identify and examine factors that may assist or hinder traditional (TCL) and computer-based collaborative learning (CSCL) among students.	RQS4: What factors assist or hinder traditional and computer-supported collaborative learning among students?

The objectives of this research require examining the existing situation in Saudi universities concerning the usage of a CSCL tool by teachers and students in ways that determine student collaboration. This information will be complemented by secondary research on the potential for collaboration among students through using a CSCL tool and practices in other countries to show further this potential from which Saudi institutions may learn. This involves reviewing the literature using mainly the ‘Summon’ tool available at Hull University and Google Scholar online. Depending on the outcome of this research, suggestions may be made to improve the collaboration. The objectives will be addressed during the primary research phase by following an appropriate methodology guided by case study research.

## 1.6 Significance of the Study

The value of exploring the importance and potential opportunities of collaborative learning is that it can be seen whether these benefits are being realised in Saudi higher educational institutions or not. This could help determine how much collaboration is currently being supported among students by teachers in Saudi higher educational institutions. Furthermore, it is pertinent to look at whether and how CL can be facilitated by digital technology use.

One of the areas of investigation in the primary research include how well CSCL is supported and facilitated at the selected institution. This is important because it could affect students’ experiences

and improve their skills and competencies in using CSCL. In addition, the research may lead to highlighting ways learning content can be delivered via a specific CSCL tool to show how student learning can be impacted positively through greater collaboration by using it.

## **1.7 Methodology Outline**

The study will adopt a qualitative research design (see Figure 3) in which the initial information during the primary research phase will be gathered by a combination of observations and interviews of university faculty and students on their use of the CSCL tools provided by their university in ways that affect collaboration among students. Important factors to consider or ask about may include:

- Does it make you collaborate with other students, and if so, in what ways?
- What extent of collaboration do you tend to make, or is possible?
- How productive is that collaboration in terms of learning?
- What are the differences between different CSCL tools in supporting collaborative learning?

The observations and interviews were conducted at Hail University among a sample of teachers and students who were in their preparatory year. The interview sample was designed to obtain in-depth insight into the role and potential of collaboration. This was obtained from the participants involved in the observations while teaching or learning at Hail University. The population under study comprises foundation-year teachers and students who currently use collaborative learning tools to assist in teaching and collaborate with other fellow students.

## **1.8 Summary and Outline of the Study**

### **1.8.1 Summary of the introduction**

Collaborative learning, particularly in CSCL but with comparisons to TCL, was the focus of this case study on CL among foundation-year students at Hail University in Saudi Arabia. The sociocultural and educational environment of the kingdom was also considered. The study was designed to provide insight into the phenomenon of collaborative learning at the selected university to establish how it is deployed and practised and to understand how it is perceived and experienced by teachers and students. This includes identifying factors that may facilitate or hinder CL, which could help educational institutions support this way of learning and deal with the potential challenges. It was anticipated that this investigation could also reveal why CL is being promoted or why it is not adopted in this institution. It is important because it could improve students' experiences and their facilities in using CSCL. The study adopts a qualitative research design. Data were gathered from observations and focus group and individual interviews with teachers and students on the foundation year.

### **1.8.2 Outline of the thesis**

The **second** chapter gives some relevant background information on the context of this study, which is Saudi Arabia, in terms of culture and the higher education sector. The **third** chapter gives more introductory information to define and characterise collaborative learning. The **fourth** chapter contains the literature review conducted to examine the field based on previous and current studies. After the literature review, the **fifth** chapter examines possible theories that might explain the phenomenon of collaborative learning. The methodology used in the present study is detailed in the **sixth** chapter, which includes details of the specific university at which the case study took place. The findings are presented in the **seventh** chapter, analysed, and discussed in the **eighth** chapter in line with previous and recent studies. Finally, the **ninth** chapter concludes the study, by focusing on implications for higher education in Saudi Arabia.

## CHAPTER 2 - CONTEXT OF THE STUDY

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### 2.1 Introduction

This chapter gives an outline of the context of the study, which is Saudi HE set within the wider context of Saudi culture. It includes a background of the specific institution at which the case study took place, and more detailed information on collaborative learning in Saudi Arabia in terms of relevant initiatives, policies and reforms, its cultural accommodation, and the practice of CSCL, which is one of the foci of the present study.

### 2.2 Saudi Arabian Culture

Some aspects of Saudi culture are described in this section that could affect the learning process significantly or explain some of the facilitating or supporting factors of collaborative learning and difficulties or challenges surrounding its implementation. The culture is also described from a comparative perspective, for which Geert Hofstede's theory of cultural dimensions may be useful (Luger, 2009). Hofstede's (1980) cultural values specify a structure through which sociologists can depict the influences of culture on the principles and values of its affiliates, and how these values relate to the behaviour of the people who live within a culture. This theory describes common cultural characteristics of different cultures based on certain dimensions to explain cultural differences, which include individualism-collectivism, uncertainty avoidance, masculinity-femininity, and power distance. As far as Arab culture is concerned, it is pertinent to note that it has the advantage of being a collectivist culture. Here, people from collectivist cultures tend to put emphasis on relationships and loyalty. In this regard, Hofstede (1984) explained that people in a collective culture belong to fewer groups but are defined more by their membership of them. This may support group work on the one hand but stifle individual creativity on the other.

Uncertainty avoidance is another important cultural aspect likely to be true because there is a tendency among Arabs to avoid uncertainty. They feel uncomfortable in unstructured situations where ambiguity and uncertainty exist (Mooij, 2009). The positive aspect of this is a preference for stable and predictable situations. Moreover, the highly conservative nature of Saudi society and the practice of gender segregation mean that restrictions are imposed in any setting that involves cross-gender interaction. This has important pedagogical implications because it means that male and female students are not normally allowed to freely interact, but the use of CSCL can provide an opportunity for interaction and mutual learning if the learning takes place remotely rather than face to face.

Hall and Hall (1990) classified countries on a scale ranging between high context and low context (see Table 2). High context defines cultures that are collectivist and relational with respect to interpersonal relationships, in which the harmony of the group is given greater importance than what individuals prefer. Low context cultures are the opposite, in which individual preferences are given greater importance than group harmony. Many Asian countries have a high context, and many Western countries have a low context. On this scale, Saudi Arabia is rated very highly at the high context end, surpassed only by Japan.

**Table 2: High and low context cultures**

<b>High Context Cultures</b>
Japan <i>Arab Countries</i> Greece Spain Italy England France North America Scandinavian Countries German-Speaking Countries
<b>Low Context Cultures</b>

Source: Hall & Hall, 1990 (adapted)

Hofstede’s (1984) dimension of individualism-collectivism is incorporated in this scale along with other important differences, such as relating to communication styles. The level of individualism or collectivism relative to the other affects the reasons for complying with an organisation’s requirements, and the type of persons admitted into positions of influence. Saudi Arabia’s high rating suggests its culture is highly contextual, which anecdotally is evident from prevalent practices such as often being direct or precise in speech and expecting the listener to have understood the meanings. Arabs believe that ambiguity leads to anxiety. Thus, Saudi members absorb that their culture is threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid this threat and be clear in their thinking (Almutari et al., 2020).

Another important cultural aspect noted by Hofstede, which is also particularly relevant to the education context with respect to teacher-student relationships, is ‘power distance’, which is described as either high or low. A high power distance prevails when information flows from teachers who are relatively few, to students who form the majority. The two are considered unequal, students regard their teachers with high respect, and the institution is perceived hierarchically. A low power distance would describe situations where teachers act more as facilitators of learning, as in

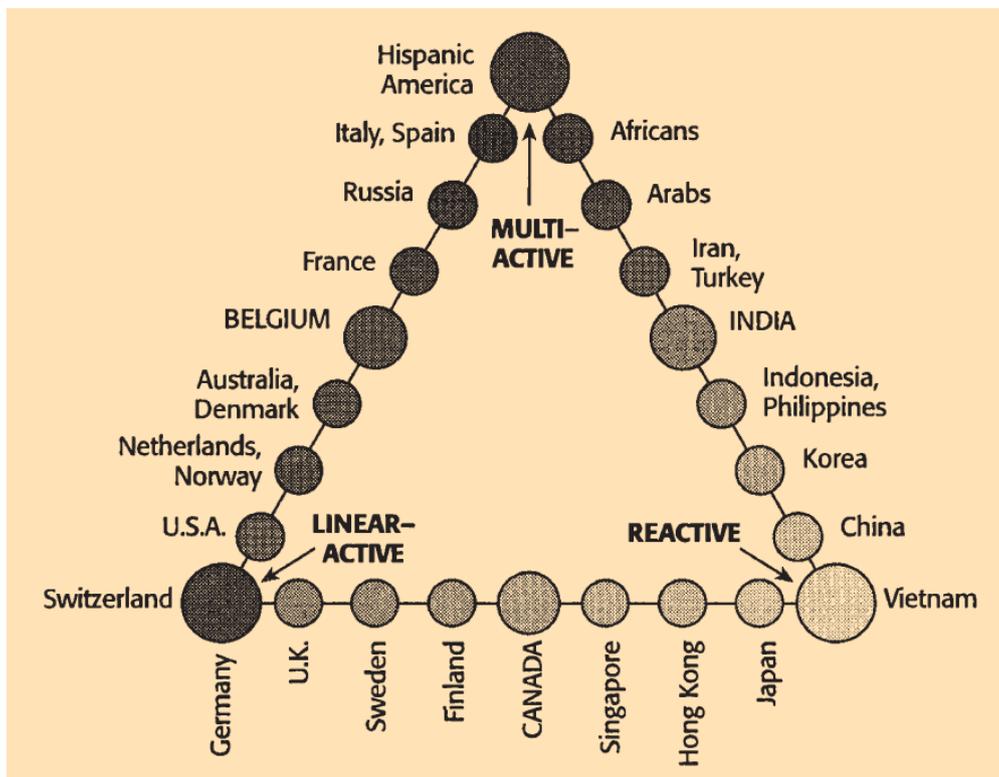
collaborative learning, rather than as sole sources of knowledge. The teachers are more approachable, available for consultation, and tend to delegate some responsibilities to their subordinates. The institution is less centralised. Interaction and collaboration among students also reduce the power distance, as there is less reliance on the teacher as under traditional learning arrangements. This is in contrast with traditional Saudi culture. Traditionally, Saudi culture, including the culture in education, has been of a high power distance, as confirmed, for example, by Albugami and Ahmed (2016). Walker and Dimmock (2005, qtd in Alsaeed, 2014) contended that when a high power distance is maintained within a collectivist culture, as is the case in Saudi Arabia, the formal authority accorded to educational leaders is enhanced and the collectivist features determine how that power is exercised.

In a detailed profiling of Saudi Arabian culture from the perspective of a Westerner wanting to engage in business, Deresky (2002) claimed that Arabs tend to feel the need to go through a process of establishing trust, and exhibiting respect for Arab social norms, before they can be expected to work closely with anyone. Furthermore, he claims that Arabs “avoid open admission of error at all costs” (p.116). However, the claims mentioned above are gross generalisations and a stereotyping of the Arab race. In addition, these observations from a foreign perspective are over one-and-a-half decades old, and the whole profile suggests the writer is not thoroughly informed of Arab culture and appears to have some animosity.

Furthermore, the observations made by Deresky (2002) identify Arab culture as collectivist with a high power distance, high uncertainty avoidance, and high context. These have implications for collaborative learning because open communication is likely to be impeded by students when communicating with their teachers. Cheng (2021) argued that cross-cultural communication between students in a collaborative context is curtailed for various reasons. In Saudi Arabia, one of these reasons is the power distance, which affects the process of learning (Cheng, 2021). An initial period may, therefore, need to be allocated for all collaborating team members to feel comfortable with each other, and at least some structure would need to be clear as to what to do or what is expected of each team member. Members should also be instructed to be as clear and precise as possible in their wording to avoid confusion on important matters. These suggestions are more likely to be advisable in the case of newly formed teams, if team members have different cultural backgrounds, or the team has members of both genders, in the case of TCL or face-to-face (F2F) CSCL. As for cross-gender interaction, preference could be given to same-gender collaboration if possible, or collaboration limited to the distant online context. On the positive side, being highly collectivist makes Saudi culture among those that are renowned for their cohesion, stability, and unity (Nishimura et al., 2008),

which can be exploited in CSCL arranged for collaborative learning when, for instance, setting group goals and objectives.

Another model specifically comparing communication is Lewis's (2005) model of cultural categories of communication (Figure 1). Lewis divided countries according to whether the communication style of its inhabitants is predominantly linear-active, reactive, or multi-active. According to this model, linear-active cultures are task-oriented, preferring to work on one task at a time, calm, decisive planners, and highly organised. They are also factual, preferring to rely on data obtained from reliable sources. Their communication is direct and straightforward, and time spent in talking and listening is usually in equal proportions. Switzerland and Germany are typical examples of linear-active cultures. Reactive cultures are more accommodating and compromising. Members are good at listening, as they prefer to listen first and may, therefore, be slow to react but, when they do, they tend to avoid confrontation. Vietnam is a typical example of a reactive culture. Multi-active cultures are warmer, more emotional, and impulsive. They often speak and listen together, which often leads to frequent interruptions, and, when they talk, it is often in a roundabout manner. Hispanic America is a typical example of a multi-active culture.



Source: Lewis (2005: 89)

**Figure 1: Cultural categories of communication**

In Lewis's (2005) model, Arab culture is also rated as highly multi-active. The indirect manner of speaking among Arabs corroborates the same point noted by Deresky (2002), but the model also shows the potential complexity of communicating and collaborating in a culturally mixed environment. Within Saudi Arabia, the culture and thus the style of communicating and collaborating is likely to be mostly **changeable**, but the potential for miscommunication and misunderstanding would be multiplied in the case mentioned above. This shows the importance of taking the culture of learners into account when designing and arranging online CL, whether using a CSCL tool or otherwise.

## **2.3 Collaborative Learning in Saudi Arabia**

This section focuses on the context of Saudi Arabia to show how collaboration among students is currently being supported by teachers in higher education institutions. It covers educational initiatives and reforms, cultural accommodation, university policies at the international and national levels, opportunities and challenges in using CSCL tools, a critique of the policy background, and collaborative learning in Saudi Arabia. A brief introduction is given first of the Saudi HE sector.

### **2.3.1 The Saudi higher education sector**

As noted by Seghayer (2014), the system of higher education in Saudi Arabia is highly centralised and controlled by the Ministry of Education (MOE). The system is designed so that students usually depend on their teacher, which shows that the traditional teacher-centred teaching approach is common. University enrolment in Saudi Arabia's HE sector amounted to 1.62 million as of the academic year 2017-2018, and an average of 250,000 students graduate annually (Quamar, 2021: 137). New universities have been constructed in recent years. Currently, there are 30 public and 13 private universities in the kingdom. The present study is centred on students studying in the preparatory year. The preparatory year in Saudi universities was arranged to bridge "the gap between the essential-public education and university one" (UOHail, 2021, n.p). During this year, students master the basics of English, mathematics, and general science and develop their academic skills and self-capabilities.

### **2.3.2 CL initiatives, policies and educational reforms**

Over the past few decades, several important educational reforms and initiatives have been implemented in Saudi Arabia, as well as policies that reflect global trends and the move towards the adoption of collaborative learning practices. Table 3 below presents a listing of major initiatives and

policies that have, over the years, led to the promotion of the technological elements essential for facilitating CSCL.

**Table 3: Saudi initiatives and policies leading to the promotion of elements essential for facilitating CSCL**

Year(s)	Initiative, policy, or reform
1964-1971	Graphics and illustrations were introduced for slides, transparencies, photographs, screen prints, and filmstrips.
1970s	Educational technologies were introduced through teacher training programmes, and by developing new instructional methods and materials for broadcasting via television and radio.
1975-1979	The Second Development Plan considerably expanded education facilities in the kingdom.
1979	Education programmes began to be delivered by radio.
1980	Establishment of General Organisation for Technical Education and Vocational Training (GOTEVOT) to promote technological education.
1980-1984	The Third National Development Plan targeted improvement in the location of facilities, their design, equipment, and maintenance.
1985	Establishment of the General Administration for Educational Technology, which introduced major changes in the Saudi education system through the provision of training, materials, and resources.
1985-1989	The Fourth National Development Plan placed emphasis on quality in education.
1990s	More widespread use of computers for teaching and learning began in educational institutions.
1990-1994	The Fifth National Development Plan emphasised ICT integration in education.
1993	Internet connection first provided to Saudi universities, beginning with King Fahd University of Petroleum and Minerals (KFUPM).
1995-1999	The Sixth National Development Plan emphasised further ICT integration in education.
1996	ICT services began to be provided to schools; the MHE established a Computer and Information Centre (CIC) to provide schools with ICT services and training to teachers and students.
1997	The public was first granted access to the internet officially, initially under supervision of King Abdul Aziz City of Science and Technology (KACST). The process began in 1994 and was completed in 1999.
1999	The Watani Project implemented to cover all schools through an extensive campaign to link them with a Wide Area Network (WAN).
2000	The MOHE (Ministry of HE) launched a project to put computers in all schools in the kingdom.
2000-2004	The Seventh National Development Plan focused in providing training to teachers and learners in ICT skills and promoting ICT integration.

Year(s)	Initiative, policy, or reform
2001	Implications of internet technologies for education began to be considered at KACST and measures were taken to make internet access more easily and widely available. Schools were connected to the internet.
2002	Government expanded GOTEVOT to include e-learning training and made it an e-library resource centre for supporting e-learning; E-Learning took hold in the KSA.
2003	First e-learning centre established at Umm al-Qura University and KFUPM for assisting the population in benefiting from learning technologies.
2004	Deanship of E-Learning and Distance Education established at King Abdulaziz University; ICT-related reforms launched in Saudi schools.
2005	Study abroad programmes initiated beginning with Saudi education in the US.
2005-2009	The Eighth National Development Plan emphasised ICT development and addressing other digital age issues, such as the digital gap.
2006	E-learning is adopted significantly throughout Saudi Arabia. Establishment of the National Centre for E-Learning and Distance Education (NCEL) in collaboration with Open University of Malaysia to support e-learning. A Future Plan for HE was developed, which included study abroad programmes first launched by King Abdullah to support the rapid growth in various technologies, and the AAFAQ project to promote the use of technology in education and improve HE in innovative ways, among other long-term objectives.
2007	Television channels started broadcasting educational programmes. Deanship of E-Learning and Distance Education also established at King Saud University. Establishment of Knowledge International University dedicated to e-learning resources. Tatweer education reforms introduced to implement new learning technologies in classes. National Communication and Information Technology Plan arranged to integrate ICT at different learning levels with a focus on the HE sector.
2008	A national plan was adopted to spread information technology throughout the kingdom, especially for supporting e-learning and distance learning. E-learning established at King Faisal University. The Google Education Programme laid the foundation for more e-learning programmes (Al-Shehri, 2010). Digital technical centres and computer laboratories established to support ICT-based educational reforms.
2009	First international conference held on e-learning and distance learning organised by the Saudi government. Distance education unit established at the University of Tabuk.
2010	Official list published of distance education in Saudi higher education institutions.
2010-2014	The Ninth National Development Plan provided for more in-service teacher training to help integrate ICT in classrooms.
2011	Saudi Electronic University established, committed to online educational activities. First graduates of distance education emerged from Saudi universities. Second international conference on e-learning and distance learning organised by the Saudi government.
2015-2019	The Tenth National Development Plan focused, among other factors, on providing more infrastructure to support educational technologies and promoting ICT skills.

Year(s)	Initiative, policy, or reform
2016	Vision 2030 formed as a national policy, which includes educational reforms to modernise the curriculum in line with the agenda of developing a knowledge-based economy.
2020	National Transformation Program (NTP) focused on technological skills development and technology integration in education systems.

Source: self-compiled from various sources (see in-text citations)

As shown in the above table, the technological components required to later make CSCL possible started to emerge in the 1960s and 1970s. However, the educational technologies introduced then were used for delivering education via the media of television and radio; not computers (Alqarni, 2015). With the establishment of the General Organisation for Technical Education and Vocational Training (GOTEVOT) in 1980, the government further promoted this technology-based education by providing the necessary training (GOTEVOT, 1989). During the first half of the 1980s, a Third National Development Plan (NDP) was developed to support this trend by improving infrastructure and resources (Alzalabani, 2002), and a General Administration for Educational Technology was established in 1985 (Alqarni, 2015), which introduced major changes in the Saudi education system through the provision of training, materials, and resources. During the latter half of the 1980s, the fourth NDP laid more emphasis on providing quality in education (Alqarni, 2015).

The use of computers to support education became more common in the 1990s in educational institutions (Almowanes, 2017). This trend was supported by providing internet connections to Saudi universities in 1993, beginning with the King Fahd University of Petroleum and Minerals (KFUPM) (Alqarni, 2015), and information and communications technology (ICT) services were eventually extended to schools as well in 1996 (Alamri, 2011). The MHE established a Computer and Information Centre (CIC) that year to provide schools with ICT services, and to provide training to teachers and students. More widespread access to the internet for the public was officially granted in 1994 until the initiative's completion in 1999 (Almowanes, 2017). The Watani Project was then implemented to include coverage to all schools through an extensive campaign to link them with a wide area network (WAN) (Akkari, 2004).

The early 21st century began with an initiative by the then-MOHE (the Ministry of Higher Education, since merged with the MOE) to put computers in all schools in the kingdom (Oyaid, 2009), making internet technologies more widely available, connecting schools to the internet, and looking at ways to exploit the potential for utilising internet technologies to support education (Alqarni, 2015). The Seventh National Development Plan thus focused on providing training to teachers and learners in

ICT skills and promoting ICT integration (Alghamdi & Holland, 2020), and, in 2002, GOTEVOT was expanded to include training for e-learning (Al-Shehri, 2010). According to research by Al-Asmari and Khan (2014), it was 2002 when e-learning took hold in the KSA, and this emphasis on e-learning and its expansion was confirmed by Al-Masaud and Gawad (2014). In 2003, the first e-learning centre was established at Umm al-Qura University and KFUPM, with the aim of enabling people to benefit from the new learning technologies (Unnisa, 2014; Alqarni, 2015). In recognition of the emerging trends in technology-based education, in the following year, 2004, a Deanship of E-Learning and Distance Education was established at King Abdulaziz University (Alqarni, 2015), and ICT-related reforms were launched in Saudi schools to promote ICT integration (Alenezi, 2016). This focus on ICT development is reflected in the Eighth National Development Plan, which also addressed other digital age issues, such as reducing the digital gap (Alharbi, 2019).

The latter part of the 2000s decade saw a significant adoption of e-learning throughout the kingdom (Aljaber, 2018). The National Centre for E-Learning and Distance Education (NCEL) was established in 2006 in collaboration with the Open University of Malaysia to support e-learning (Aldiab et al., 2016; Aljaber, 2018), and a new future plan was developed for HE. This plan included the initiative of 'study abroad' programmes, one reason being to make students more accustomed to taking advantage of the rapid growth in computer technologies (Taylor & Albasri, 2014), and an AAFAQ project, which means 'Horizons'. AAFAQ was a joint initiative by the Saudi MOE and KFUPM, which, among other long-term objectives, sought to promote the use of technology in education and improve HE in innovative ways (Sawahel, 2009). The following year, in 2007, the support of e-learning in HE took the form of the establishment of a Deanship of E-Learning and Distance Education at KSU (Albalawi, 2007), the establishment of a Knowledge International University dedicated to e-learning based education (KIU, 2021), and the arrangement of the National Communication and Information Technology Plan to integrate ICT at different learning levels with a focus on the HE sector (Unnisa, 2014). Additionally, education reforms under the name of Tatweer were introduced to implement the above-mentioned new learning technologies in classes (Tayan, 2017). This led to expanding the scope of the national plan in 2008 to spread information technology in education throughout the kingdom, especially to support e-learning and distance learning (Al-Harbi, 2011). The Google Education Programme in the same year laid the foundation for more e-learning programmes (Al-Shehri, 2010), and numerous digital technical centres and computer laboratories were established to support these ICT-based educational reforms (Oyaid, 2009). This required more technical expertise on the part of the teachers, so the Ninth National Development Plan provided for more in-service teacher training to help integrate ICT in classrooms (Alharbi, 2019).

In recognition of the above-mentioned trends, the Saudi government organised its first international conference on e-learning and distance learning in 2009 and established a distance education unit at the University of Tabuk (Al-Harbi, 2011). This focus on ‘distance education’ at the time led to publishing an official list of distance education in Saudi HE institutions in 2010 (Al-Harbi, 2011). The first graduates of distance education then emerged from Saudi universities in 2011 (Al-Harbi, 2011), and, in the same year, another university was established, called the Saudi Electronic University, which is committed to online educational activities (Aljaber, 2018). Among the aims of the two conferences held in 2009 and 2011 was to explore ways in which new applications, such as learning management systems (LMSs), can be used to improve education, and among the recommendations was greater integration of Web 2.0 technologies in higher education programmes. These technologies include forums, wikis, and blogs, which allow engagement, interaction, and collaborative learning to take place (NCEL, 2014). To support these newer educational technologies, the Tenth National Development Plan focused, among other aspects, on providing more infrastructure for them, as well as further promoting ICT skills (Al-Habeeb, 2014).

The kingdom’s new ‘2030 Vision’ devised in 2016 aims to transition the Saudi economy away from over-reliance on oil revenues towards a more balanced investment model (Patalong, 2016) and a knowledge-based economy. A key part of this is educational reforms to provide, as stated: “a modern curriculum focused on rigorous standards in literacy, numeracy, skills and character development” (Patalong, 2016, n.p.). This includes reforms in the education system, education philosophy, the role of teachers, and in teaching methods (Kerr, 2016; UNESCO, 2016). It aims to be a comprehensive reform of the entire education system to help transform the kingdom. Of interest to this study is the apparent increasing acceptance of teachers as facilitators of learning, and the need to provide students with opportunities to engage “in a more collaborative learning environment” in contrast with the traditional “fragmented, skill-based curriculum that focused on memorization and repetition drills” (Al-Kinani, 2013, n.p.). For the Saudi Vision 2030 to be realised, it would be necessary for teachers “to engage in effective change processes, to prepare Saudi students to enter a globalized workforce. Teachers, principals, and curricula should assist schools’ need for change” (Makhlouf, 2021: 58). This change in thinking and practice coincides with the increasing use of technology in educational institutions in Saudi Arabia and the rapid adoption of e-learning (Alqarni, 2015), hence the potential importance of this study.

In line with the 2030 Vision, the National Transformation Program (NTP) was launched, which focuses on the development of technological skills and the integration of technology in education systems. According to an examination of the Saudi Vision 2030 and NTP 2020 by Mitchell and

Alfuraih (2018: 36), the two have led to making the kingdom's goals and aspirations "increasingly... more clearly defined with attention to alignment between national education goals and economic development whilst ensuring that practices are consistent with Islamic beliefs". The many decades of planning and policymaking have culminated in these programmes and ensured their clarity. Potentially, this indicates a good positioning for the kingdom and the future of computer-based education for Saudi teachers and students.

Moreover, in addition to having the primary responsibility for teaching and educating students, teachers in the KSA are among the crucial stakeholders engaged in the process of bringing a change in the education system. For this reason, the Saudi Arabian Ministry of Education recognised the need to capitalise on and upskill a number of their 'best' education professionals. The aim of this initiative is to increase the technical, interpersonal and leadership capacity of Saudi educators. In this regard, Allmnakrah et al. (2020) claimed that in order for the Saudi government to implement Vision 2030 effectively, in-service and pre-service teachers need to be equipped with essential critical thinking skills and trained in innovative ways. As such, teachers are seen as change agents and active partners, rather than passive receivers in education reform (ibid). The outcomes of this developing pressure to enhance the skills and experiences of Saudi educators led the country to review its process of education, including financial constraints, the irrelevance of curricula, and the lack of qualified teachers and school leaders.

### **2.3.3 Cultural accommodation of collaborative learning**

Notably, Algami and Male (2014) regard the Saudi government's aspiration to implement collaborative learning at the level of government policy as a radical shift from the traditional centralised decision making in educational settings in Saudi Arabia. They also highlight the conflict between the traditional way of teaching and learning and the new way, which promotes collaborative learning, among other innovations. This situation is also highlighted by Alghamdi (2016) (see 4.6) as a difficulty in transitioning from a traditional teacher-centred approach in education to a student-centred one, although there is no evidence of reluctance to become accustomed to the latter (Alasmari, 2014). This may, therefore, be seen as a challenge to be overcome rather than an obstacle, one which requires facilitating a fundamental change in attitudes and perceptions and in cultural accommodation. In this regard, Mezirow (1994) defined transformational learning theory as being "constructivist, an orientation which holds that the way learners interpret and reinterpret their sense experience is, central to making meaning and hence learning" (p.222). Thus, it involves two types of learning: instrumental learning and communicative learning. The former concentrates on learning through task-oriented problem solving and determination of cause-and-effect relationships (Taylor,

1998). The latter focuses on how individuals communicate their feelings, needs and desires with others, and, as Mezirow (1997) described it, assists learners to become critical, autonomous, and responsible thinkers.

In 1962, Rogers developed the Diffusion of Innovation (DOI) Theory to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The outcome of this diffusion is that people, as part of a social system, adopt a new idea, behaviour, or product. Adoption means that a person does something different from what they had previously (e.g., purchase or use a new product, or acquire and perform a new behaviour). The key to adoption is that the person must perceive the idea, behaviour, or product as new or innovative. It is through this that diffusion is possible. Sahin (2006) explained that in the context of educational technology, Rogers' DOI theory can be used to understand how teachers and students adopt new technologies in the classroom. Educational technology includes a wide range of tools, such as online learning platforms, educational software, and digital resources. The adoption of these technologies can have a significant impact on teaching and learning outcomes. According to Rogers' theory, the adoption of educational technology is influenced by several factors. The characteristics of the technology itself, such as its perceived relative advantage over traditional teaching methods and its compatibility with existing teaching practices, can affect its adoption. The communication channels used to disseminate information about the technology, such as professional development programmes and peer networks, can also affect its adoption. In addition, the social system in which the technology is being introduced can affect its adoption. This includes factors such as the school culture, the support of administrators and colleagues, and the availability of resources to implement the technology. Finally, the characteristics of the adopters themselves, such as their attitudes towards technology and their level of technological expertise, can also influence the adoption of educational technology. Overall, Rogers' DOI theory provides a useful framework for understanding how educational technology is adopted by teachers and students. By considering the various factors that influence adoption, educators and administrators can better understand how to introduce new technologies effectively and maximise their impact on teaching and learning.

In this way, the kingdom's educational reforms reflect the general transformation of Saudi society and its economy in opening up to the rest of the world and adopting practices and technologies that can potentially help Saudi Arabia in becoming more competitive and diverse. Although collaborative learning is distinguishable from cooperative learning (see section 3.3), the findings of a case study on perceptions of Saudi teachers towards training in cooperative learning (Almulla, 2016) support the above comments on challenges in transforming the Saudi education sector away from a teacher-

centred approach. Firstly, this study shows the need for teacher training in implementing new teaching methodologies. Secondly, it shows the importance of considering the possible challenges in transforming the educational system and finding more ways besides training alone for ensuring the transformation is successful.

### **2.3.4 University policies on collaborative learning and technology adoption**

It is now time to explore collaborative learning practices in Saudi universities.

#### ***2.3.4.1 Collaborative learning practices in Saudi universities***

The need for collaborative learning could not be found for a Saudi university within an official document from a few major universities. This concept is nonetheless recommended by some people involved in the Saudi higher education sector. For example, Smith and Aboummoh (2013) have given a detailed overview of this sector in Saudi Arabia and they make several recommendations as a remedy for what they perceive as the Saudi kingdom's inability to produce a significant amount of knowledge workers. Among their recommendations is the following on arranging for collaborative networks to support collaborative learning: "success cannot be achieved unless the necessary human and physical resources, administrative infrastructure, technology systems and collaborative networks are in place" (p.4).

Notably, Saudi academics and government officials identified an issue with a lack of qualitative data and data collected strategically to provide insight in the field, and the quality of quantitative data that were available was problematic due to variations in formats and level of detail, making it difficult to draw comparisons. With regard to their recommendations, these appear to reflect a growing concern to ensure the Saudi higher education sector has suitable infrastructure in place so that collaborative learning among students can be facilitated. However, there is a focus in their report on medical education to improve the learning of medical students (Alqarni, 2016). It is noted under 'roots of collaborative learning' (see 3.2) that this concept in the modern sense arose when teaching medical students in Britain in the 1950s, but there is no reason why other, non-medical, students cannot also benefit from collaborative learning practices.

Collaborative learning may have immense potential for medical students, for instance, to help in reaching a consensus in making a diagnosis, but especially in the context of Arab countries generally, there is another particular and larger group that can benefit. According to Tubaishat et al. (2006), female students can gain a lot from collaborative learning opportunities due to the lack of opportunities they are given for face-to-face communication in mixed-gender environments. They

hold this view based on their research on ICT experiences in two Middle Eastern universities. They explored the impact of technology on culture in higher education by conducting surveys at two different Arab countries (Jordan and the United Arab Emirates [UAE]) and found that collaborative learning can be beneficial for improving the confidence of learners in front of members of the opposite gender, particularly for females. They noted that “technology allows students to meet, communicate, and collaborate in a virtual academic environment where most of the cultural and social limitations disappear... [which] helps students to be more expressive and improve their confidence level” (p. 675). The survey sample in this study was small (163 student participants), which was explained as due to small class sizes at the university in the UAE. The small sample is a weakness of this study, so further research or more studies would need to be found to confirm this situation.

However, a study with 707 Saudi students, albeit on cooperative rather than collaborative learning, found a generally positive attitude towards collaborative learning in coeducational settings among both genders (Alanazy, 2011). For voice chat and video conferencing, the students preferred to interact with individuals of the same gender, but were more comfortable with other forms of communicating and interacting, such as forums and blogs. Nonetheless, the finding is reassuring for the future of cooperative and collaborative learning in Saudi Arabia, where open mixed-gender communication between non-related people is not the norm. The positive attitude promoted by, and toward collaborative learning is confirmed in a more recent study by Alghamdi (2018), despite some concerns over data, privacy, and security.

As a consequence of the social fabric of Saudi Arabia in terms of women, such as female students’ parents not allowing them to travel to cities for education, collaborative learning tools are not only recommended for female students to use, but also for female lecturers, given that there is “a considerable shortage” of female lecturers in Saudi HE institutions to encourage more female lecturers to apply for university positions (Al-Khalifa, 2010, n.p.). In view of this situation, the Saudi MOHE has acknowledged the need and potential for a coordinated and collaborative approach to e-learning in Saudi universities. Many Saudi students are typically given course materials and instructed to study on their own, so enabling female lecturers to deliver lectures using collaborative learning tools can help to alleviate this shortage.

Although only a very limited number of studies were found in relation to CL in Saudi Arabia, it has been shown that collaborative learning can be applied usefully in the country for certain groups of people. These groups would include medical students, female students, and female lecturers, to which the same can be done for potential knowledge workers. It could help overcome the restrictions

imposed by gender segregation by allowing a lecturer of any gender to teach students of any gender. The points mentioned above support the need for promoting collaborative learning in the KSA, as well as the value of this current study in making a useful potential contribution to the field.

## **2.4 Summary**

The present study is set in the context of a Saudi HE institution, namely Hail University situated in Hail, Saudi Arabia. Although there are also some international teachers and students at the university, the majority share the Saudi cultural background. This makes Saudi culture a major influence and may explain much of the perceptions and experiences of most of the teachers and students. Other researchers have described the culture as collectivist and highly conservative, with high uncertainty avoidance, a high context that prioritises group harmony, and as having a high power distance. This confirms the researcher's own perceptions, as he is from the same background. The collectivist nature, high context, and high power distance explain, for example, why teachers are seen as authoritative, and why there is reluctance to express disagreement. At the same time, Saudis are also known for their cohesion, stability, and unity, which may be seen as helpful for achieving group goals. On the other hand, the multi-active nature of the culture also means potential for miscommunication and misunderstanding.

The education system in Saudi Arabia is highly centralised and is controlled by the MOE. The system is traditionally oriented towards teacher-centred learning, although there are initiatives to promote educational technologies and methods. The main national policy that has an impact on educational institutions and is driving educational reforms is Vision 2030, which aims to modernise the curriculum in line with the wider agenda of developing a knowledge-based economy to make the Saudi economy more competitive and diverse. Noticeable trends are an increasing acceptance of teachers as facilitators of learning and the increased adoption of e-learning practices. Saudi universities in general tend to follow such international trends that facilitate collaborative learning, as was shown with respect to practices in UK universities. Groups that can benefit from collaborative learning arrangements in Saudi Arabia include female lecturers and students and medical students, due to the restrictions imposed by gender segregation in F2F learning. Some studies, such as those by Alanazy (2011) and Alghamdi (2018), have shown a generally positive attitude of Saudi students towards collaborative learning.

## CHAPTER 3 - LEARNING THEORIES

---

### 3.1 Introduction

Several theoretical approaches may be taken to examine CL: information processing, developmental, sociocultural, and cognition (Hmelo et al., 2013); and several theories might explain the phenomenon. A comprehensive approach is also possible, such as the micro-ecological framework suggested by Borge and Mercier (2019), in which CSCL is treated as complex and cognitively nested. The research in the present study is in line with the sociocultural approach, as the focus is on views, perceptions, and qualitative experiences, although cognitive benefits are also identified. Phillips (1995) identifies three theoretical frameworks that are suitable for the study: social constructivism theory, cognitive load theory, and achievement goal theory. Social constructivism theory suggests that learning occurs through social interactions and the construction of knowledge through experiences. Cognitive load theory focuses on the cognitive processes involved in learning, such as attention and memory, and how they can be managed to enhance learning. Achievement goal theory explores the goals that individuals set for themselves in the learning process and how these goals impact their motivation and learning outcomes. These frameworks offer different perspectives on the process of learning and can be used to inform the design and implementation of effective learning strategies. The first two could be useful in helping to design learning materials appropriately, and the last two could help shed light on the learning process under collaboration, which is essentially a learner-centred approach in which knowledge is constructed because of the social interaction among learners.

Online collaborative learning theory was proposed by Harasim (2012) to explain learning environments on the internet that support collaboration and knowledge building. The theory identifies three knowledge construction phases: idea generation, idea organisation, and intellectual convergence, based on social constructivism. However, the model is teacher-centred, better suited for small learning environments, and not scalable (Picciano, 2017). Importantly, it does not have a framework for judging if a discourse is collaborative (Oncu & Cakir, 2011). This makes it unable to establish how collaboration can lead to learning. For these reasons, this theory was not considered further.

### 3.2 Learning and Instructional Theories

Various learning and instructional theories, such as behaviourist, cognitive and constructivist, were considered to explain the phenomenon of collaborative learning practices, even though this study does not look at learning outcomes specifically, nor was there any kind of quantitative measuring or

comparisons across the groups. The selection of these instructional theories was also necessary to understand how conditions boost the chance of learning and improve instruction.

### **3.2.1 Social constructivism**

Collaborative learning is fundamentally a form of social constructivist learning because it aligns with the constructivist ideas propounded by Vygotsky, Piaget and others. It recognises that knowledge is attained through social interaction and thus acknowledges the importance of communication and social discourse in learning (Schell & Janicki, 2013). Therefore, social constructivism is a learning paradigm that shares the same foundation as collaborative learning (Seel, 2011). The roots of collaborative learning in Piaget's constructivist theory were mentioned earlier in section 3.2 from a historical perspective. This subsection takes this further by examining collaborative learning from a theoretical standpoint concerning teaching and learning.

Social constructivists view learning as a search for meaning, rather than information transfer. Furthermore, it is assumed that knowledge is constructed while learning collaboratively with others in groups instead of as separate individuals, although this also takes place. The present study explores this collaborative or social constructivist form of learning to give insight into the perceptions and experiences of teachers and students.

Given that CSCL tools are designed according to the social constructivist theory of learning principles, Behnagh and Yasrebi (2020) examined whether they have been implemented pedagogically and how well they adhere to the approach. Their study confirmed that most tenets of constructivism are complied with by the CSCL tools examined concerning social outcomes and productive use. However, improvements were necessary to improve the situation of inequalities of access since constructivist educational technologies are utilised to reduce these inequalities (Behnagh & Yasrebi, 2020). Otherwise, the tools were found to provide flexible ways to learn and interact and support the scaffolding of knowledge.

## **3.3 Educational Psychological Theories**

### **3.3.1 Cognitive load theory**

Cognitive load theory (CLT), which was developed in the 1980s, is important in the field of educational psychology, as it has the potential to guide the design of learning materials according to the mental ability of learners (Lambert et al., 2009; Al Asraj et al., 2011). This theory is concerned with long-term memory interaction with short-term memory and the latter's limitations (Kirschner, 2002). For example, short-term memory can cause an overload if multiple chunks of information are

given for processing simultaneously, which would inhibit learning. However, the idea is not to require learners to engage their short-term memory to mentally integrate the learning material in order to minimise their cognitive load and maximise the effectiveness of learning outcomes. Thus, CLT provides a set of common learning principles for making instructional environments efficient by leveraging human cognitive learning processes (Clark et al., 2006). Although the theory has traditionally been applied to analyse individual learning, it can be used with CSCL by incorporating concepts such as collective working memory, mutual cognitive interdependence, which arises from depending on the expertise of others, and transaction costs, which is the burden due to the collaboration (Janssen & Kirschner, 2020).

To understand the construct of 'cognitive load' in determining a suitable instructional technique, three different types can be distinguished: intrinsic, extraneous, and germane, the sum of the three types giving the total cognitive load. Intrinsic cognitive load (ICL) is the load experienced on memory as required by a task involving thinking. It occurs, for instance, when non-interactive elements must be learned together. A high degree of interactivity between elements in complex learning materials imposes the need upon learners to learn individual aspects, which requires an understanding of the relationship between them. This cognitive load tends to arise when students have weak metacognitive skills or spatial ability (Plass et al., 2010).

Extraneous cognitive load (ECL) is imposed by the materials, procedures, and techniques used for learning. ECL is high if these are poorly designed because a learner would need to spend more mental effort in understanding. Chandler and Sweller (1992) clarified this concept further by pointing out that it is not the load inherent in the instruction but that imposed by the designer when structuring and presenting the instructional information. The third, germane cognitive load (GCL), refers to the free capacity present in short-term memory that can be redirected from ECL for acquiring a schema (Sweller, 1999).

For any given task, intrinsic cognitive load cannot be changed, but the other two can vary and are inversely proportional to each other. The greater the extraneous load, the less would be the germane load. For good instructional design, the goal is normally to reduce extraneous cognitive load and incorporate activities that depend on germane load to optimise learning (de Jong, 2010). Poor instructional design tends to cause unnecessarily high extraneous cognitive load, which may be overcome by low intrinsic cognitive load, making more working memory resources available.

In addition to the three types of cognitive load, two main processes in learning are also recognised, namely schema construction and automation. Schema construction involves extracting and

manipulating information in short-term memory (Sweller, 1998). Schemas are knowledge structures for holding information retained in long-term memory. When using these schemas becomes habitual and effortless, it is called automation. According to Pollock et al. (2002), a schema is necessary for processing highly interactive elements so that the material can be understood. This allows all the details to be processed simultaneously in one's working memory. Therefore, for the cognitive load to be reduced, Pollack recommended that highly interactive elements be presented initially as isolated elements and then again after the schema has been formed. The lesson is to consider prior knowledge when designing instructional material containing highly interactive components and promote the construction of a schema in learners. Therefore, it may also be advisable to incorporate an assessment of this prior knowledge into the design.

Unnecessary information or 'redundancy' can also increase cognitive load, interfering with learning. This may be additional information given or presented in different forms, although some redundancy is permissible if the data can be shown in isolation (Chandler & Sweller, 1991). A related issue is that of 'split attention', which occurs when a need is imposed to mentally integrate several sources of unrelated information where each is dependent on the other to be understood. This can also interfere with learning due to the load on short-term memory. According to Yeung et al. (1998), a learner with a low level of expertise will require additional information to develop understanding, which may produce a redundancy effect; considering these findings, a balance may be necessary to cater to learners with a low level of expertise on the one hand but to minimise the redundancy effect on the other.

Research by Mayer and Moreno (2002) on multimedia in instructional design identified three important cognitive processes for this learning context. They then formed seven major principles of multimedia design. These three cognitive processes and seven major principles for incorporating multimedia in instructional design are specified below.

Cognitive processes in multimedia learning:

- *Selecting* – Processing verbal information as text and visual information as images.
- *Organising* – Applying the image and verbal bases to the concept to be learned.
- *Integrating* – Building connections between the two bases.

Major principles of multimedia design:

- *Multiple representations* – Presenting a clarification in words and pictures is better than solely using words.

- *Contiguity* – Present words and pictures instantaneously instead of individually.
- *Split attention* – Present words as auditory account instead of visually as screen texts.
- *Coherence* – Use fewer rather than many inessential words and pictures.
- *Modality* – Learning is effective from animation and narration rather than animation and text.
- *Personalisation* – Learning is more effective from animation and narration when the narration is conversational rather than formal.
- *Redundancy* – Learning is more effective from animation and narration than from animation, narration, and text.

These processes relate to selecting, organising, and integrating verbal and visual information, and the seven principles are formed to make learning effective. Notably, the first principle seeks to cater to multiple learning styles. The third, fifth and seventh principles seek to limit the range instead, and the second, fourth and sixth aim to simplify the learning process. The first principle recommends using both words and pictures, whereas the other three (three, five and seven) collectively give preference to verbal information.

The concept of cognitive load can be applied to various forms of instructional material, including animations, simulations, and educational games. For example, Hegarty et al. (2003) compared static diagrams with computer animations. Although no evidence was found that animations enable a higher understanding over static diagrams, asking learners about the diagrams, projecting what would happen and verbally explaining the dynamic processes involved enhanced knowledge of the diagrams. Experienced learners, however, benefited more from the animations. This difference between less and more experienced learners is corroborated by another study, in which Kalyuga (2008) concluded that less experienced learners benefit more from static illustrations, and more experienced learners from animations, in terms of performance. This may be explained by skilled learners handling the transitivity in animations, which imposes an extra cognitive load on less experienced learners. Furthermore, it shows the importance of considering the level of expertise of learners when designing instructional material for online learning.

The impact of cognitive load on learning is equally applicable in complete e-learning environments when using a CSCL tool. The quality of the instructional design can either facilitate or hinder learning, depending on the cognitive load (Kirschner et al., 2018). For learning to be effective, the instructional design used for e-learning should strike a balance between creating an engaging and interactive environment and ensuring the mental effort required is manageable. When this learning takes place at a distance, achieving this balance becomes more difficult because designers have little control over

the learning processes involved and the insight gained by the learner. Difficulties arise when a gap exists between the expectations of the course designers, the use of the course materials, the usefulness of this material, and learners' opinions (Martens et al., 2007).

A key concern in delivering courses through online or blended learning is whether it is possible to achieve higher-order learning, such as in-depth understanding, but this is challenging to measure. There is also a practice of having a community of scholars for an ideal construction of meaningful and deep knowledge (Ramsden, 2003). The possibility for learners engaged in online or blended learning to achieve high levels of cognitive presence and learning outcomes was established by Akyol and Garrison (2011). The researchers used a mixed-methods methodology, including transcript analysis and interviews, to assess perceived learning, satisfaction, and other learning outcomes. Cognitive presence was found to be related to perceived and actual learning outcomes. Thus, these findings help educators, researchers, and instructional designers to benefit from the cognitive presence research trends to advance the online learning quality.

### **3.3.2 Achievement goal theory**

Achievement goals provide a framework for event interpretation and response where a goal may be to either achieve a certain task or gain a certain ability (Hmelo-Silver et al., 2013). The former is also called a mastery goal, the latter a performance goal, and research (Hmelo-Silver et al., 2013) suggests some students pursue a performance-avoidance approach. Whichever of the three methods is taken, it is predictive of student behaviour, strategy use, and effects. Generally, mastery goals support emotional well-being, self-efficacy, interest, and cognitive engagement (Linnenbrink & Pintrich, 2000), and performance goals benefit by supporting achievement, effort, and persistence (Linnenbrink-Garcia et al., 2008). On the other hand, performance-avoidance goals have been consistently associated with less adaptive outcomes, such as avoidance of seeking help, reduced self-efficacy, achievement and intrinsic motivation, external use of strategy, and heightened anxiety. However, it is also suggested that students benefit from the first two types of goals since they are adaptive (Pintrich, 2000).

Achievement goal theory can be applied to analyse small groups because classroom contexts can shape goal orientations. Moreover, collaboration groups can support mastery goals, particularly when the pedagogical strategy encourages learners to view other group members as useful sources of information (Webb et al., 2006). Finally, it is theorised that group tasks can help sustain mastery when the topic is interesting, and when the problem or task is authentic and moderately challenging. Overall, regarding group work, the whole is better than the number of its segments. While producing,

supervising, and assessing groups is a recursive course, active learning techniques are valuable for students. Complementing lectures with group work supports students to feel involved and consequently learn more.

### **3.4 Learning Theories and Saudi HE**

CL has been gaining traction in Saudi Arabia as an effective pedagogical approach that promotes social interaction and active learning among students and enhances students' learning experiences and outcomes. Cognitivism, for instance, emphasises the mental processes involved in learning, such as attention, memory, and problem solving. This theory emphasises the importance of active participation and engagement in the learning process and highlights the role of prior knowledge and experience (Piaget, 1977). In the context of CL, cognitivism suggests that students need to be actively involved in the learning process, and to share their prior knowledge and experiences with other students. In Saudi Arabia, studies have shown that CL enhances students' cognitive development, including their critical thinking and problem-solving skills (Alshumaimeri et al., 2018). Furthermore, constructivism proposes that learning is an active process of constructing knowledge and meaning through interactions with the environment. According to this theory, learners are actively engaged in constructing their understanding of the world around them (Vygotsky, 1978). In the context of CL, constructivism suggests that learners need to be actively engaged in constructing their understanding through social interactions and dialogue with their peers. In Saudi Arabia, constructivism has been used to promote CL by encouraging students to engage in group discussions and the sharing of ideas (Alenazi, 2018). According to Alenazi (2018), CL promotes students' active construction of knowledge and enhances their critical thinking and creativity.

Social learning theory emphasises the importance of observing and modelling the behaviour of others. According to this theory, learning can occur through direct instruction, observation, or imitation of others (Bandura, 1977). In the context of CL, social learning theory suggests that learners can observe and model the behaviour of their peers and learn from their experiences. In Saudi Arabia, CL has been used to promote social learning by allowing students to interact and learn from each other (Almalki & Almalki, 2019). According to Almalki and Almalki (2019), CL enhances students' social skills, communication, and interpersonal relationships.

In conclusion, the influence of learning theories on CL in Saudi Arabia is significant. Cognitivism, constructivism, and social learning theory have been used to promote CL among students by providing insights into how learners acquire new knowledge and skills. These theories have been used to design effective instructional strategies and interventions that cater to different learning styles

and preferences, ultimately leading to more effective and efficient learning outcomes. It is evident that CL can enhance students' cognitive, social, and emotional development, and more research is needed to explore its potential for promoting effective teaching and learning practices in Saudi Arabia.

### **3.5 Summary**

Learning theories are essential in understanding the process of acquiring new knowledge and skills. These theories provide educators with a framework to design effective instructional strategies and interventions that cater to different learning styles and preferences. Social learning theory emphasises the importance of observing and modelling the behaviour of others. This theory is essential in designing strategies that provide learners with opportunities to observe and imitate the behaviours of experts. Constructivism proposes that learning is an active process of constructing knowledge and meaning through interactions with the environment. This theory is essential in designing strategies that promote exploration, discovery, and active participation in the learning process. Cognitivism focuses on the mental processes involved in learning, such as attention, memory, and problem solving. This theory is essential in understanding how learners process and retain information, and it guides the design of strategies that promote active participation and engagement in the learning process. Thus, learning theories provide educators with valuable insights into how learners acquire new knowledge and skills. By understanding these theories, educators can design effective instructional strategies and interventions that cater to different learning styles and preferences, ultimately leading to more effective and efficient learning outcomes. Finally, constructivist learning theory and social learning theory have significantly contributed to the promotion and implementation of collaborative learning in Saudi Arabia. The adoption of these theories has enabled teachers to create learning environments that promote active learning, critical thinking, and problem-solving skills among students. Furthermore, the use of technology and the development of collaborative learning communities have facilitated the sharing of knowledge and experiences among students, leading to a more effective and efficient learning process.

The next chapter will also revisit how these four learning theories lead to collaborative learning. It will also briefly re-examine these theories in the literature review chapter. The literature review will cover different viewpoints and research studies that explore the relationship between these theories and CL. It will provide insights into how CL can enhance the effectiveness of each theory and how each theory can contribute to CL. Overall, the literature review chapter will discuss how the integration of these theories can lead to effective CL outcomes.

## CHAPTER 4 - COLLABORATIVE LEARNING AND DIVERSE LEARNING APPROACHES

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### 4.1 Introduction

This chapter provides an overview of CL and aims to explore its development and show how it has evolved with time. It starts by discussing in brief the roots of CL within the field of education and then goes on to present relevant definitions. The chapter looks at how, as education applied new methods of learning, CL has been developed and defined to emphasise the importance of collaboration and its potential benefits, drawbacks, and limitations. In parallel, this chapter aims to characterise CL and facilitate addressing the last two research questions (RQS3-4) on the factors that assist and facilitate CL and those that obstruct or hinder it in the context described in the previous chapter. It is first established that this mode of learning has been practised for thousands of years, and an attempt is made to identify the origins of its present-day form.

### 4.2 Roots of Collaborative Learning

Learning collaboratively through social interaction can be traced to ancient civilisations. For instance, students learned together in the Hindu ‘gurukul’ system during the Vedic Age as part of an important stage of their life. In addition, several wise men and prophets, such as Buddha, Socrates, Confucius (Tu, 1985: 56), Jesus, and Muhammad (PBUH), encouraged social interaction to support learning and employed the strategy of repetition to reinforce learning. For example, the idea of learning together is promoted by such verses of the Holy Quran as 5:2, in which we are commanded to “help one another in good deeds and piety”, and the Prophet Muhammad’s (PBUH) own sayings, such as “The faithful are to one another like a building where each part strengthens others”, and “The hand of Allah (His support) is with those (who work together) in groups”.

Aristotle emphasised the importance of a collaborative form of deliberation, which he regarded as “rhetoric informed and guided by moral prudence or practical wisdom (phronesis)” (Gross & Kemmann, 2005: 90). Collaborative deliberation was understood as a way of ‘knowing together’. In the 20<sup>th</sup> century, inspired by Aristotle’s *Rhetoric*, Heidegger (1889-1976) encouraged “collaborative deliberation” on contested matters to understand the truth (Sloane, 2001: 336).

According to research conducted by Bruffee (1992), the term and idea of collaborative learning as understood today emerged in the 1950s among teachers in British secondary schools, and a postgraduate biologist studying medical education. The outcome of this effort was a publication titled

*Aims and Techniques of Group Teaching* by Abercrombie (1974), based on ten years of experience with training medical students. It was realised that reaching a consensus on a diagnosis collectively, rather than individually, through small group discussion was highly effective in making students sophisticated diagnosticians. As a result, diagnoses were more accurate and quickly reached. Abercrombie realised that learning diagnostic judgement is a social process rather than an individual one and then devised a teaching course to help students learn through collaboration.

Around the same time, Mason (1972), in his book *Collaborative Learning*, addressed both specific pedagogical concerns over competitive environments and pragmatic concerns over not meeting students' needs. The motivation was to reform the secondary school system by encouraging interdisciplinary study, group collaboration, discussion, and dialogue to replace the existing system, which was seen as too specialised, overly competitive, authoritarian, and thus what he considered as 'socially destructive' for failing to prepare the students to meet the needs of a demanding world (p. 8). Based on these and other sources, Bruffee himself, among other teachers, promoted the practice of collaboration, specifically for composition or writing tasks.

The roots of modern collaborative learning, however, lie earlier in the developmental psychology theories of Jean Piaget (1896-1980) and Lev Vygotsky (1896-1934) (Hmelo-Silver, 2013). Piaget's constructivist theory on how young learners form conceptual structures through interacting with their environment is important for collaborative learning. It suggests children are more likely to develop cognitively when peers have equal opportunities to influence each other. Collaboration was especially emphasised for less mature students to build understanding (Kessen, 1983). Vygotsky expanded on the dialectical relationship between children and their sociocultural environment, and Vygotsky's concept of the Zone of Proximal Development supports the idea of collaborative learning by suggesting that students can perform better on tasks if they are supported by capable partners, instead of working individually. In doing so, collaboration allows for externalising thoughts and the evolution of the cognitive processes based on what others do and say (Vygotsky, 1978).

Slavin (2012) emphasised the importance of interacting with others in their environment and purposeful teaching and Robert Siegler (b.1949) held that students could learn from each other. Social interaction was thus seen as important as it engages learners to especially observe the more experienced or older learners around them to help themselves develop. This pinpointing of the sociocultural nature of learning was Vygotsky's most important contribution to the field of learning theory (Roth & Lee, 2007).

The contemporary concept of collaborative learning is grounded in the social constructivism paradigm, which creates new knowledge. This pedagogy assumes that “people make meaning together and that the process enriches and enlarges them” (Siddiqui, 2009: 194). Social constructivism thus views knowledge as being socially produced, instead of pre-existing, and waiting only to be discovered. When students collaborate, they are independent and free to exchange ideas, and there is a lack of group structure and an atmosphere of dissent. Although teachers may serve as facilitators, they are treated as group members. The primary goal is to generate a solution through interaction, which means constructing knowledge. This approach to learning assumes, of course, that the meaning made will be useful, constructive, and enriching, as the possibility of weaknesses in the collaboration is also present.

Other key early proponents of learning through social interaction whose ideas have also been influential in laying the foundation for collaborative learning were Dewey, who encouraged open discussion and exchange for the mind to emerge (Garrison et al., 2012); Deutsch, who encouraged cooperation among students as it helped to develop mutual trust and forge cohesion (IRMA, 2010); and Rogoff (1994), who first conceived of the idea of learners coming together and engaging actively in a shared endeavour because it was thought that this is where learning occurs through asymmetrical roles played by each participant.

This short section has presented an overview of the roots of collaborative learning, drawing on the work of some of the authors that have been influential in this field. It is not possible to provide an exhaustive overview given the word limitations of this thesis.

### **4.3 Definitions of Collaborative Learning**

This study is about collaborative learning, both through a CSCL approach and through traditional face-to-face CL practices. Traditional collaborative learning (TCL) will be the term used for CL practices in which no digital technologies are used to facilitate collaboration, whereas CL is generally used to refer to both traditional and computer-supported collaborative learning. Smith and MacGregor (1992: 9) defined “Collaborative learning” as:

An umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together. Usually, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. Collaborative learning activities vary widely, but most center on students’ exploration or application of the course material, not simply the teacher’s presentation or explication of it.

Collaborative learning is essentially a form or mode of learning. Learning may be defined as “the process by which knowledge, concepts, skills and attitudes are acquired, understood, applied and extended” (Pollard et al., 2008: 170). Since collaboration is an intrinsic part of CL, collaboration should also be defined. **To serve the purposes of this research, this thesis has adopted the definition provided by Roschelle and Teasley (1995: 70):**

Collaboration is a process by which individuals negotiate and share meanings relevant to the problem-solving task at hand... Collaboration is a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem.

**On that basis, CL is an educational approach that emphasises students working together in groups to achieve shared learning goals. It is based on the idea that students can learn from one another through sharing knowledge, skills, and experiences. In CL, students are encouraged to actively engage with their peers, take responsibility for their own learning, and contribute to the learning of others in the group. This approach can take many different forms, including group projects, peer teaching, problem-based learning, and cooperative learning. CL has been shown to have many benefits, including improved critical thinking skills, better retention of information, increased motivation and engagement, and the development of social and communication skills. However, it can also present challenges, such as issues with group dynamics, communication, and coordination. Effective implementation of CL requires careful planning, clear expectations and guidelines, and ongoing support and feedback from teachers or facilitators.**

CL thus refers to how students interact for learning, which further leads to their reaching a consensus in their knowledge while learning in this way. It describes an arrangement for learning whereby students collaborate in their learning. Simply put, it is a situation in which two or more learners learn together. The collaboration examined here is a collaboration among students, rather than between students and teachers. Compared with simple collaboration, CL directs the collaboration to learn among the collaborators.

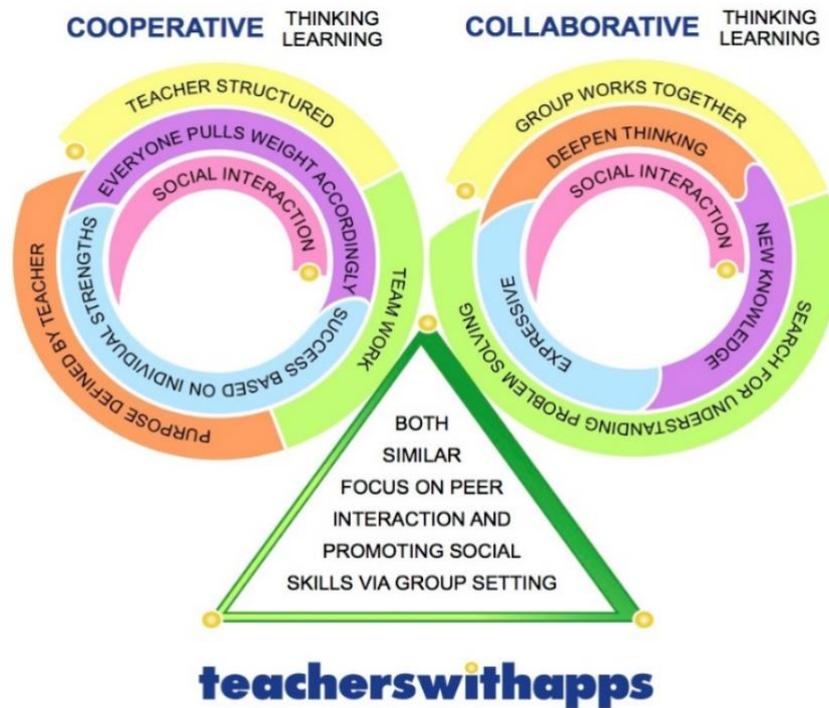
This understanding of collaborative learning is reflected in Siddiqui's (2009) identification of three key defining features: intentional design, co-labouring, and meaningful learning. It involves cooperation for a common cause, to benefit in terms of learning. Tsai (2011) defines it more formally as an environment in which learners engage in common authentic tasks such that each of them is dependent on and accountable to others in the same learning group. This learning method is supported theoretically concerning cognition, motivation, and its potential for social cohesion (Cullen et al., 2013). It can also, therefore, be considered as a teaching strategy (Bouroumi & Fajr, 2014).

Therefore, learning collaboratively offers certain advantages to learners to help them learn effectively in certain situations. The potential advantages of collaborative learning are explored in subsection 4.2.

#### **4.4 Distinctions of Collaborative Learning**

At this point, it may be pertinent to distinguish between CL and other similar practices, such as cooperative learning, to avoid confusion, as the two terms are sometimes used interchangeably. To clarify the concept of collaborative learning further, it is noted that these other similar learning arrangements to collaborative learning are cooperative learning, group learning, team learning, and peer-assisted learning. However, collaborative learning has three key features that distinguish it from the forms of learning mentioned previously. These features are (1) intentional design, meaning students are given planned learning activities structured by faculty members; (2) co-labouring, meaning all participants engage together actively towards achieving their objectives; and (3) meaningful learning takes place, meaning the knowledge deepens learners' understanding (Siddiqui, 2009).

Students also interact under cooperative learning, and, as with CL, they are usually arranged in groups to enhance learning (Pitler et al., 2012: 73). The students listen actively and communicate to reach a common understanding while deepening their knowledge of the topic. However, the emphasis under CL is on students making progress personally while working collectively towards a common goal, and the students' effort usually generates new knowledge. In contrast, cooperative learning is typically more structured by the teacher, and the teacher also defines the purpose. These similarities and differences are highlighted in Figure 2 below.



Source: Teachers with Apps, 2015

**Figure 2: Differences between cooperative and collaborative learning**

However, Stahl (2015) pointed out another important distinction in learning: students cooperate under cooperative learning by working together, but the learning is done by individuals who contribute what they learned individually and present that as the group product. In other words, the learning takes place separately. This contrasts with collaborative learning, in which those individuals are seen even more as group members, and they negotiate and share meaning through interaction. Individual learning still occurs under collaborative learning, but learning is also analysable as a group process. Cooperative learning thus remains within traditional conceptualisations of educational methods, whereas CL parallels the shift in learning sciences from a narrow focus on individual learning to incorporating group learning.

From a wider perspective, cooperative and collaborative learning may be seen as forms of what Damon and Phelps (1989) identified as peer learning. They added peer tutoring as another, third form. Peer tutoring, cooperative learning, and collaborative learning are subsets or types of peer learning. The perspective they took is grounded in developmental psychology. The distinctions they made between the three (see Table 4) further clarify the nature of collaborative learning, as distinguished from its nearest alternatives. These distinctions are about the equality between the tutor and tutees or pupils and the latter's influence on their tutor. In peer learning, the two are low, which indicates a

high level of teacher control; cooperative learning is mixed, where equality is high but the influence on tutors is low, and, under collaborative learning, both aspects are described as high. That is, collaborative learning is characterised by a high degree of equality among peers and the mutuality of their influence (Hmelo-Silver, 2013: 2), as teachers work more as facilitators and guides and students have more control over their learning.

**Table 4: Distinctions between three forms of peer learning**

<b>Equality/Influence</b>	<b>Peer Tutoring</b>	<b>Cooperative Learning</b>	<b>Collaborative Learning</b>
Equality between tutor and tutees	Low	High	High
Influence of tutees on tutor	Low	Low	High

Considering the subtypes of CL, usually, while using a CSCL tool for collaboration, there is no face-to-face interaction. However, as highlighted earlier, one of the claimed advantages of using a CSCL tool is offering alternative ways of interacting. Therefore, it has the potential to facilitate greater collaboration. Although the interaction is a critical aspect of making collaborative learning effective, the shared task responsibility undertaken during the interaction demonstrates the superiority of this form of learning (O'Malley, 2012). This aspect of interaction in collaborative learning is examined further below, under 'Characteristics of Collaborative Learning'. This collaboration is among teachers, students, or both teachers and students. However, the type of collaboration of primary interest to this study is collaboration through implementing a CSCL tool, as per the first two research questions.

#### **4.5 Characteristics of Collaborative Learning**

Identifying characteristics of collaborative learning is necessary to delving further into examining the development of collaborative learning. For instance, Chang and Windeatt (2016) reviewed the aspects of learning collaboratively among a group of 47 university students learning English online. The artefacts examined included written assignments, posts on discussion forums provided through their CSCL tool, reflective journals, questionnaires, and email exchanges, which were analysed using selective, open, axial coding by applying a framework based on Dillenbourg's concepts of situation, interactions, mechanisms, and effects. Their study identified three important forms of collaborating: working in groups, reading each other's work, and providing feedback. Moreover, their study showed the importance of social aspects and allowed time for collaboration to develop. They also noted how confidence, trust, and a sense of community gradually developed among the students, indicating that changes can occur in the pattern of collaboration.

When considering how CL is distinguished from other forms of peer learning (see 3.3 above), collaborative learning is identifiable by building a group or community of learners that interact with each other. This view is reflected, for example, by Rimor et al. (2010), Windeatt (2016), and Tesavrita et al. (2017). The group serves members by enabling them to ask questions and obtain knowledge from each other (Rimor et al., 2010), forming distributed authority (Armstrong, 2011). The interactions take the form of reading each other's work, providing feedback, and commenting or responding to further the discussion (Chang & Windeatt, 2016). There is a common purpose in this joint endeavour, such as producing new knowledge (Tesavrita et al., 2017), or the goal may be to reach some form of consensus (Rimor et al., 2010; Armstrong, 2011).

The study by Armstrong (2011) was in depth, albeit with a small sample of seven faculty staff. Nevertheless, it showed evidence of alignment or interdependence; elements integral to collaborative learning practices are building a community, fostering communication between its members, developing a structure for learning, and evaluating based on non-traditional processes and products. This brings to the fore the concept of communities of practice (CoP), introduced by the theorist Etienne Wenger (1998), who encapsulated CoP as groups of people sharing concerns or passions for something they achieve and learning how to achieve it better as they cooperate regularly. This is not necessarily intentional. Thus, for CoP to be effective, three components are essential: the domain, the community, and the practice. The domain requires a CoP to have an identity defined by a shared domain of interest. The community means that members of a specific domain interact and engage in shared activities to build relationships enabling them to learn from each other. Finally, practice simply denotes practice and participation in what they all have an interest in.

Along similar lines, situated learning theory explains that a group of people who are embedded in their communities become more autonomous. In this regard, Storberg-Walker (2005) confirms that a positive bond forms between the existence of CoPs in a corporation and the amount of real individual autonomy in that association. Moreover, a community of inquiry (CoI) means a group of people collaboratively involved in purposeful critical discourse and reflection to construct personal meanings and approve mutual understandings. This process of creating a deep and meaningful learning experience depends on the following elements. The first element is social presence, defined as "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities" (Garrison, 2009: 352). The second is teaching presence, which involves the design, facilitation, and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes (Anderson et al., 2001).

Finally, cognitive presence is the degree to which students can conceptualise and ratify meanings through sustained contemplation and discourse (Garrison et al., 2001).

These characteristics identify the nature of a collaborative learning environment. Therefore, they would be looked for to ensure that a typical CL environment has been arranged, as necessary, during the primary research observations. Also important besides interaction are social aspects of collaboration, as found in the study by Chang and Windeatt (2016) based on data from a range of sources belonging to 47 university students during a 15-week course. Important social aspects identified in this study are time and confidence. Collaboration patterns changed over time as a sense of community and mutual trust developed, which suggests the importance of ensuring the development of trust and a community spirit.

#### **4.5.1 Forms of interaction and cognitive mechanisms**

It has been identified above that collaborative learning is characterised by collaboratively working together in groups. This involves, for example, reading the works of others and giving feedback, all of which are forms of interaction. A critical review of the literature shows that several different forms of interaction have been identified while learners engage in learning collaboratively. These have been termed initiative, externalisation, and rapid consensus. In their study on collaboration using Google Docs, Rimor et al. (2010) investigated these interactions and found that:

- Initiative occurs when a group member serves as a source of knowledge by asking questions and obtaining the knowledge reciprocally.
- Externalisation occurs when a learner contributes to a discussion without referring to those made by others.
- Rapid consensus occurs when a learner accepts the opinions of his peers because it allows for advancing the discussion rapidly even if they are not persuaded or disagree.

If these are rephrased as questions, the following indications (underlined) are made in case the answers are in the affirmative:

- Is the question posed an original one? If yes, then it is a new initiative.
- Is the contribution to the discussion original? If yes, then it is evidence of externalisation.
- Was the opinion accepted even if disagreeing? If yes, then it contributed to achieving a rapid consensus.

In addition to the interaction among group members, Dillenbourg (2009: 6) proposed that the key to understanding collaborative learning also lies in the relations with three additional items: the situation, learning mechanisms, and the effects of collaborative learning, described as follows:

- A situation is likely to lead to collaboration, as group members of similar status are more likely to collaborate than dissimilar.
- The *interactions* among the group can involve collaboration to a greater or lesser degree.
- Learning mechanisms - some may be more intrinsically collaborative when negotiating to reach an agreement instead of through individual induction.
- Effects of collaborative learning - for instance, interaction effects may be different for the performance of a group or its individuals.

Based on the above four aspects, which interrelate with each other and are all cognitive mechanisms, Dillenbourg (1999) defined collaborative learning as “a situation in which particular forms of interaction among people are expected to occur, which would trigger learning mechanisms” (p. 7). The interaction phenomenon is still central to understanding collaborative learning. However, it is also important to consider the context in which it takes place, how it affects learning, and its expected outcome.

Hernandez-Selles et al. (2020) identified three necessary types of interaction while implementing collaboration to facilitate the convergence of knowledge, based on the results of a factor analysis involving 106 learners studying five different subjects at the higher education level. The three necessary forms of interaction are social interaction, which occurs at a social level, ensures motivation and support, and prevents isolation; cognitive interaction linked to cognition, which occurs while negotiating shared meaning and achieving knowledge convergence; and organisational interaction related to effective organisation and self-regulation of the group. More precisely, their results showed “treating teammates with respect” (p.7) to be the most important element of social interaction; developing “critical and self-critical capacity... to make consensual decisions” (p.10) as most important for cognitive interaction; and “help[ing] other team members to learn” (p. 8) as most important for organisational interaction. Given this finding, the social and cognitive dimensions are distinguished in examining the benefits and drawbacks of CL in section 4.2 and reflected in the rest of the chapter.

#### **4.6 Modes of Deployment of Collaborative Learning**

Since collaborative learning involves communication (Collins, 2016), interaction (Chang & Windeatt, 2016), and collaboration in groups or teams, it is a social learning process, in contrast with

individual or solo learning. As shown in section 3.3, this defines CL. Furthermore, the groups formed for collaborative learning are usually heterogeneous, so the teaching-learning process may be enhanced (Bhat et al., 2020). Another aspect that defines CL is the tool used to support the collaboration (see 4.4.2). Of course, it is possible to learn collaboratively without using any device. It is not uncommon in Saudi Arabia for computers to be used today for CL (Alghamdi, 2016), as in many other parts of the world. The chief characteristics that define the two modalities of CL mentioned above are summarised in Table 5 below. CSCL, which is the main focus of this study.

**Table 5: Modalities of deploying collaborative learning**

Mode of Deployment	Chief Characteristics		
	Requirements	Distance	Time
CSCL	Computer-based tools to facilitate the collaboration	Can take place from anywhere as long as the computers are networked	Can take place asynchronously
- Standalone tools	Only the tool/program used for collaboration	As above	As above
- Integrated tools	The whole package of tools/programs	As above	As above
TCL (non-CSCL)	No computer-based tools required	Can only take place F2F	Can only take place simultaneously

The distance and time characteristics show another distinction concerning modality between synchronous and asynchronous learning. TCL can only occur synchronously, which means all learners must be simultaneously present in person at one site. On the other hand, computer technology has enabled collaboration to occur at any distance if the computers are networked, either locally or by being connected to the internet, and synchronously or asynchronously. Synchronous learning may involve, for example, F2F seminars or video conferencing, and asynchronous learning is made possible, for instance, by prescribed reading, recorded lectures, and discussion forums. Either way, CSCL provides conveniences to learners to not necessarily have to travel to a specific learning location. Additionally, the option of learning later occurs when the teacher makes the learning material available online. Since CSCL can be arranged either F2F or remotely, the two can be distinguished, but CSCL is treated singularly for this study.

Despite the conveniences of CSCL, an F2F TCL arrangement, also referred to in this study as non-CSCL, continues to be adopted as well, with the advantage that no computer-based tools and internet connections are required. However, according to Dziuban et al. (2018), asynchronous approaches alongside synchronous ones has become the ‘new normal’ in online learning under an overall blended

learning arrangement. To distinguish between the two terms – synchronous and asynchronous – Fabriz et al. (2021: 2) argued that synchronous online learning refers to learning that takes place in real time, where students and instructors interact with each other at the same time. This can be through live videoconferencing, chat rooms, or other interactive tools. Synchronous learning provides students with the opportunity to ask questions and receive immediate feedback, which can help to keep them engaged and motivated.

Asynchronous online learning, on the other hand, refers to learning that takes place at different times, where students can access course materials and complete assignments at their own pace. Asynchronous learning is often delivered through pre-recorded lectures, discussion boards, and other self-paced activities. This type of learning can be more flexible for students who have other commitments, as they can work on the course at their own pace and to their own schedule (Fabriz et al., 2021).

Both synchronous and asynchronous online learning have their advantages and disadvantages, and which one to use depends on various factors, such as the course content, the student's needs, and the instructor's teaching style. Some courses may be better suited to synchronous learning, such as those that require a lot of interaction or discussion, whereas others may be more appropriate for asynchronous learning, such as those that involve self-study or individual work. Ultimately, the choice between synchronous and asynchronous learning depends on the goals and objectives of the course and the needs and preferences of the learners.

Incidentally, the asynchronous mode of learning is preferred by introverts (Bhagat et al., 2019), and females are generally more self-regulating online (Alghamdi et al., 2020). Overall, males can cope with different learning strategies (Yu, 2021), which suggests a greater ability to adapt to various learning modalities. The importance of considering students' introversion/extroversion aspect is also confirmed by Fatimah et al. (2020) in their study of individual and cultural characteristics in adopting CSCL. These would also determine the preferred mode of collaborating.

#### **4.7 Summary**

Learning together collaboratively in groups through social interaction has ancient roots. However, the concept of collaborative learning as understood today was traced back to research by Kenneth Bruffee in the 1950s, the teaching experiences of Abercrombie in training medical students, and a publication by Edwin Mason (1972) specifically on how collaborative learning could address pedagogical concerns of his time. Further impetus for promoting collaborative learning came from

developmental psychology, particularly constructivist theory, and the paradigm of social constructivism in which people make meaning together and knowledge is produced socially. Several definitions of collaborative learning were referred to in this chapter; however, according to Siddiqui (2009), it involves an intentional design, which means structured activities, co-labouring, whereby participants engage together, and meaningful learning so that knowledge deepens learners' understanding. There is interaction and cooperation for a common cause. It is different from cooperative learning and peer tutoring in that individual students are seen strongly as members of a group, usually heterogeneous. Students can also progress personally while working collectively, there is greater equality between the tutor and tutees, and the latter's influence on the tutor is great.

Collaborative learning is further characterised by members reading each other's work and giving feedback (Chang & Windeatt, 2016). Forms of interaction that take place while learning collaboratively were then recognised as involving an initiative, a process of externalisation, and reaching a rapid consensus. Dillenbourg (2009) suggested three more cognitive aspects to understand collaborative learning, besides interactions: the situation likely to lead to collaboration, learning mechanisms, and the effects of the collaboration. According to Hernandez-Selles (2020), there are three necessary types of exchange for collaborative learning: social interaction, cognitive interaction, and organisational interaction. Collaborative learning may be deployed in two key ways, referred to in this study as TCL or non-CSCL (traditional collaborative learning) and CSCL (computer-supported collaborative learning). The fundamental differences are that TCL can only take place in F2F situations in which teaching and learning occur simultaneously.

In contrast, CSCL, which relies on computer devices and networking, can occur from anywhere and either synchronously or asynchronously. CSCL may be distinguished further according to whether the CL tools used are standalone or part of an integrated package. Blended learning arrangements are also popular in which both synchronous and asynchronous approaches are adopted together, but CL may or may not be selected in either or both modes. A literature review is conducted in the next chapter to examine what has been found regarding collaborative learning in previous studies, particularly opportunities, challenges, perceptions, experiences, and facilitation factors.

## **CHAPTER 5 - COLLABORATIVE LEARNING: FEATURES, COMPARISONS, DEVELOPMENTS, IMPLEMENTATION AND PRACTICE**

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### **5.1 Introduction**

The characteristics of collaborative learning and an outline of its development, practices, and usage of CSCL tools were discussed in Chapter 3 with an emphasis on the Saudi HE context, described earlier in Chapter 2. The secondary research in this present chapter examines the field of collaborative learning with a focus on collaborative learning using computer-based learning (CBL) tools, known as computer-supported collaborative learning (CSCL), in addition to traditional collaborative learning (TCL) in which computers are not in use. Selected studies on CL in the HE sector are examined in depth to provide sufficient insight based on the existing literature to inform the research objectives. The literature review has been structured accordingly. It builds upon the formal definitions of collaboration and collaborative learning given earlier in section 3.3 and the importance established for collaborative learning by highlighting its potential opportunities and disadvantages for students, as reported in previous studies on student perceptions of CL.

The review also covers the central topic of perceptions and attitudes towards collaborative learning, the facilitation and support of collaborative learning in terms of pedagogical aspects, technological tools and other important factors, and how common challenges have been dealt with after first identifying the possible challenges that may arise. The remainder of the chapter considers CSCL tools and discusses their potential benefits for supporting and enhancing collaboration among learners, mostly on research conducted since 1989 when the term CSCL was first used to describe CBL applied to supporting collaboration (see entry for 1988 in Table 7).

Studies relevant to collaborative learning in higher education are critically examined in this chapter, including a special focus on the context of HE in Saudi Arabia. The studies were obtained mostly using the home university's Summon tool, Google Scholar, and the Saudi Digital Library, which is provided by the Saudi MOE. The search results involved mostly peer-reviewed and published journal articles and some conference proceedings. Consequently, magazines and newspaper reviews were excluded as unsuitable sources. The search was also refined to include only the context of education and no others, such as management, and to focus only on those arranged to guide learning

collaboratively, including computer-based collaborative learning. Moreover, the aim throughout was to identify key studies and relevant theories.

This focus also helped define important headings and subheadings to divide the literature review, establish the educational importance of collaborative learning, and draw comparisons between studies. For example, some studies use different terms from collaborative learning, such as collaboration, cooperation, or group learning. The goal was to ensure the inclusion of material on essential aspects of the research, namely keywords, definitions, theories, and themes. This led to reaching a point of saturation when the same kind of information kept appearing. Those studies were then selected that were considered typical samples and had the strongest data and empirical evidence to help devise an appropriate methodology for the current study.

## **5.2 Opportunities and Challenges of Collaborative Learning**

This section of the literature review critically examines the claimed opportunities alongside the challenges of CL. The extensive review of previous studies revealed numerous opportunities for collaborative learning, including benefits, compared to individual learning. This section highlights a sample of these claims before examining potential limitations in the following section. These opportunities may be categorised into personal, social, and cognitive, and the purported benefits of improved academic performance.

The potential opportunities of collaborative learning are examined, particularly concerning its effectiveness. Although this is not a key concern of the present study, promoting collaborative learning is only worthwhile if efficacy can be established. Claims of the effectiveness of CL have been made for specific skills, such as speaking and communicative ability generally (Mesh, 2010; Rahmawati, 2016), writing (Mesh, 2010; Yu, 2013; Mutdrivanti, 2016; Alammar, 2017), problem solving (Cho & Lim, 2017), and reading comprehension (Mesh, 2010). However, the effectiveness of CL might be improved, for example, by enhancing teachers' professional knowledge and skills (Quackenbush, 2020). This is likely because a more highly trained teacher would be in a better position than a less trained one to exploit the potential of CL.

Researchers have identified several potential opportunities for collaborative learning. For example, Yucel et al. (2016) highlighted common and expected benefits, such as improvement in the quality of interactions; a study by Forment et al. (2012) mentions benefits of a particular collaborative learning tool, in their case, the wiki, under CSCL; and Mutdrivanti (2016) found that CL made learning more enjoyable. In addition, benefits have also been reported for teachers, such as in Chen

et al. (2015: 330), who found that teachers could teach in better ways using wikis through “more understandable and lively science teaching content” and the generation of more creative strategies in instruction. In the Saudi context, Alahdal (2019) investigated the usefulness of CL in English as a foreign language (EFL) classrooms of Saudi tertiary education institutions. The report depended on questionnaires and interviews to obtain quantitative and qualitative information from 40 purposefully selected EFL teachers and learners. The participants voiced their views about how CL influenced the current pedagogical practices at Qassim University. The study findings emphasised both teachers and students observed CL positively and concluded that it is the best method for learning a foreign language.

Conversely, a meta-analysis of several studies on CL conducted between 2003 and 2013 concluded that despite many claimed benefits in various environments, it is still difficult to pinpoint the success factors due to insufficient detail and comparative data (Knutas et al., 2019). One example is the research of Mustakim et al. (2020), who investigated the effectiveness of online learning in developing collaborative learning by students during the Covid-19 pandemic. Their findings concluded that teachers could master online learning applications but failed in building collaborative learning among the students. Struggles such as “the presence of the students in different places”, “difficulty in accessing the internet network especially the students living in” a rural “region”, and finally the impossibility of “monitoring the students’ activity during the online learning” made it hard for learning collaboration and coordination to take place. Although the Covid-19 pandemic had brought significant challenges to CL practice, “the education stakeholders need to take [something] positive out of this crisis so that instead of losing the ability to learn and lead school collaboratively”, they can develop it (EPPN, 2020: 20).

Despite the many potential benefits of learning collaboratively in groups highlighted above, it would also be necessary to point out some of the possible negative effects of learning in this way, so that these can be identified, for example, to see if they are impeding effective collaboration in Saudi Arabia (RQS4), and for ensuring opportunities for CL can deal with, overcome, or prevent such effects. Therefore, the purpose of one of the following subsections is to show briefly that learning collaboratively in groups can potentially have drawbacks and be detrimental to learning. However, these can be minimised or even avoided when providing students with learning experiences such as focused group methods and problem-solving approaches. Furthermore, they show the need for considering facilitating factors for supporting collaborative learning, which is done in section 4.5, and using computer-based tools either exclusively or in a blended learning situation, which is done in the next section of this chapter.

### 5.2.1 Personal and social opportunities of collaborative learning

It is claimed that CL encourages learners to help and support each other, motivating all participants to attain their own personal and shared group goals (Johnson & Johnson, 2003). Moreover, it enhances students' social interaction skills and encourages them to work at their best (Ghavifekr, 2020). These are not universal experiences, however, as there is also evidence showing, for example, that CSCL causes frustration, as well as difficulties relating to imbalanced commitment, lack of shared goals, quality of contributions, and wastage of time (Capdeferro & Romero, 2012).

Similarly, Rogoff (2003) suggests that collaborative learning activates the desire present within learners to be sociable. It helps support their development by relating to their social and cultural environment. This relation is important because learners' thinking is impacted by the environment in which they learn and interact with others (Robson, 2006). However, these kinds of outcomes are not uncommon in other non-collaborative approaches to learning, such as active learning strategies for motivating students for developing high-level critical thinking (Stolk & Harari, 2014) and achievement motivation and emotional-social learning for fostering the social adjustment of university students (Turki et al., 2017).

In their study on how collaborative learning, specifically CSCL, develops during an online language course, Chang and Windeatt (2016) noted the importance of the social aspect of collaboration. They observed a gradual development of communication, confidence among the students, and a sense of mutual trust and community spirit, including for those initially reluctant to participate in the collaboration. Consequently, they recommended that instructors allow collaboration to develop among their learners. In short, by facilitating the communication of knowledge between students (Mohamed et al., 2008; Alblehai, 2011), collaboration helps learners go beyond what they would otherwise be capable of achieving independently (Posey & Lyons, 2011). For this reason, for instance, Driscoll (2002) recommended that it should be included as an essential component in a blended learning situation, which combines F2F learning with e-learning.

Among the potential negative effects of collaborative learning highlighted in the literature are some individuals losing control over their learning, which is usually greater when learning individually. The whole experience is perceived as a waste of time. However, these outcomes are affected by conditions such as group attributes and size (Almajed, 2015). Time is often wasted with unclear goals and objectives, inadequate preparation, lack of participation and sharing, and individuals in the group who are not inclined to learn. Other issues, such as frustration and imbalanced commitment, were mentioned earlier. These drawbacks may be avoided or mitigated by ensuring that the group attributes

facilitate effective collaborative learning. These include guaranteeing harmony of goals and motivations and shared approaches towards learning among the group members.

The findings of a study by Lin (2017) are of further interest because they investigated collaborative learning in a similar cultural context of a developing country. Their qualitative enquiry, based on the written reflections of 60 students, interviews and field notes, into collaborative learning in the Chinese higher education sector revealed two key dilemmas. Firstly, it was found that collaborative learning conflicts with students' learning behaviours and their grammar-oriented examination system. Secondly, power differentials in Chinese society work in opposition by creating distances between peers and not encouraging much interaction. This makes the cultural context a potential barrier to the true spirit of CL, which occurs based on open interaction and equality, as detailed in section 3.4.

Similarly, using comparative analyses, Catalano (2018: 89) studied the effects of applying CL strategy to students from Romania, Poland, Turkey, and the Republic of Moldavia to form and develop their visual art competencies. She concluded that CL is a didactic approach that aims to raise cognitive and social interdependence among learners by seeing inter-individual differences and investing educational agents with an active role. This formulates the individual strategies of each student with those of the membership group. Once they know each other better, students have no restraint in stating their own knowledge. For example, "They learn to listen to the views of those in the group, even if they are different from their own, to support their understanding by arguing with them, engaging in critical and creative thinking, and openly engaging in *dialogue*" (Catalano, 2018: 89). CL also motivates students and improves their performance by contributing collectively. Utilising the contributions of each member of the group led to the rise of concepts that group members had not previously encountered. Simply put, one group comes up with a notion and advances from the collective discussion with different views from other group members.

### **5.2.2 Cognitive opportunities and challenges of collaborative learning**

Different studies have investigated the effectiveness of collaborative learning for students' ability to learn cognitively (So et al., 2010; Cacciamani et al., 2012), as well as understanding how their critical thinking skills improve (Warsah et al., 2021). In addition to active learning and the potential of collaborative learning leading to a deeper understanding because of the exposure to a variety of ideas arising in the group and other cognitive benefits identified above, Weller (2002) also saw there was an outcome of collaborative learning in terms of improved communication skills and ability to reflect, which was corroborated recently by Mahawan and Langprayoon (2020) for communication skills in English among trainee teachers. Kessler and Bikowski (2010) further saw that collaborative learning

provided opportunities for individual learners to develop autonomy, which gave them their own space beside the space in which they collaborated with their peers. These studies highlight the socio-affective benefits of collaborative learning, which are also fundamental to learning.

Furthermore, the opportunities of CL have also been studied concerning the flipped learning approach. For example, to comprehend the CL process when the students partook of flipped learning, Cheng et al. (2021) examined 171 participants to envisage aspects of learning satisfaction in flipped learning by embarking on a questionnaire survey. The findings implied that CL and cognition are important predictors of learning satisfaction. Thus, *to comprehend whether CL is an imperative interpreter of learning outcomes*, Cheng et al. (2021) further interviewed 12 students from six different flipped-teaching courses. The results implied that organising activities to inspire *students to know* each other before class helped them find the corresponding group and facilitated their expertise for CL. Furthermore, the instrument induced “team members’ engagement, discussion atmosphere, and efficiency” (Cheng et al., 2021: 1). Similarly, when learning tasks *varied*, it enhanced students’ creative faculty and empathy, and even promoted mutual learning.

When looking more specifically at CSCL, online collaborative learning can be seen to help develop the other essential skills identified earlier – critical thinking, self-reflection, problem-solving, and co-constructing knowledge and meaning (Chiong & Jovanovic, 2012). This was also confirmed earlier by Gilles et al. (2008), who showed that collaborative and peer-mediated learning promotes learning and develops high-level thinking skills and pro-social behaviour across all groups. In a study by Poudel (2020), teachers did not give sufficient attention to enhancing these higher-order thinking skills in students, and yet CSCL was still able to enhance some cognitive skills in their students. This shows the potential of CSCL for improving cognitive skills generally, but especially if the arrangement is made to target the development of higher-order thinking skills specifically. In Warsah et al.’s (2021) study, which involved 40 learners in Indonesia, it was found that after developing critical thinking skills, collaborative learning improved their motivation for learning emotional awareness and made them more efficient and broad-minded.

Furthermore, as Veerman (2000) pointed out, collaborative learning can be seen as aiding in the co-construction of knowledge. It can help bring about new knowledge, although outcomes and results are of greater importance. This process of ‘knowledge building’ is an important aspect of learning because it assists students in reading, criticising, and developing their contributions in an environment conducive to holding discussions (Law et al., 2011). Studies in this area of collaborative learning for knowledge building include those by Scardamalia and Bereiter (2006), Noorozi et al. (2013), and

Yucel and Usleul (2016). Noorozi et al., for instance, claim that an online collaborative learning environment that is specially designed to provide students with opportunities to learn collaboratively helps them to participate more in the knowledge-building process, compared with traditional classroom environments. Knowledge building could, therefore, be a possible focus for CSCL tools.

In the study by Yucel and Usleul (2016) referred to above, the researchers investigated the knowledge-building process in an online collaborative learning environment and the interaction and participation of students while collaborating. The students used CSCL tools provided through the Moodle LMS, and the researcher reviewed the interaction and involvement in terms of quantity, quality, content, and the scaffolds of 145 prospective teachers. Data were collected from log records and content analysis of postings on knowledge forums, and a convergent parallel method was used. As a result, there was evidence of development in opinion building, expression of forms, note creation, and build-on of the students in knowledge-building processes, as well as proof of progress, especially in terms of academic content and the quality of interaction and participation. In addition, there was evidence of even more significant improvement concerning the quality of both interaction and participation, in that the knowledge-building environment directly contributed to building opinion and expression.

### **5.2.3 Academic opportunities and challenges of collaborative learning**

The two studies mentioned earlier by Bouroumi and Fajr (2014) and Muuro et al. (2016) highlight the mixed reports of the educational benefits of collaborative learning. For instance, Bouroumi and Fajr (2014) relied on using the online version of a one-semester course designed for two groups of master's students at Ben M'sik Faculty of Sciences to revisit the importance of CL in comparison to traditional CL. Their study claimed improvements in academic performance. Muuro et al. (2016), on the other hand, employed a questionnaire that surveyed two public universities and two private universities to identify students' trials in an online CL environment. The findings of the research displayed no significant disparities in scores. The improvement in the case of Bouroumi and Fajr (2014) was attributed to an efficient combination of principles and tools that support collaborative learning, thus showing the need for identifying specific qualities that enable collaborative learning to be effective.

The study by Muuro et al. (2016) highlights other reasons for why collaborative learning might not make a difference, which in their case was due to several problems and experiences that were common to all the experimental and control groups. This study adopted an experimental design by creating one experimental and two control groups, conducting both pre- and post-tests, and involved 90 first-

year university students. That the sample only contained first-year students might explain the presence of many of these problems because they might not have settled into university life and might not have been accustomed to using online collaborative learning tools. A sample of students from different years could control for this deficiency. As for the claim of improved performance in Bouroumi and Fajr (2014), the sample sizes of the two comparison groups (24 and 23) were too small for this finding to be generalised. Therefore, both these studies have design weaknesses, but the claimed effectiveness of collaborative learning in academic achievement is re-examined separately in more studies.

It is thought that allowing students access to their fellow students in this collaborative way gives them the chance to work together to make their learning more effective than traditional F2F learning (Tsai, 2011). Tsai (2011) found that students who learned in a collaborative learning context had significantly higher grades than those who attended traditional lectures. However, it is pertinent to note the limitations of this study, in that different groups were given different amounts of tuition and guidance, so these were not uniformly applied. It is also evident from the very high grades that some groups had more enthusiastic teachers, so their students were more motivated and excited. These factors are very likely to undermine the conclusions drawn from the data. Therefore, more research would be required to substantiate or reject this collaborative learning claim, which results in improved grades. As for claims of improvement in grades by Tsai (2011), another study by Davies and Graff (2005) showed that grades were not significantly improved, although it was also the case that those who failed were found to be those who interacted less frequently. These contradictory findings are examined under 'facilitating factors and challenges' (see section 5.6). However, the practice of grouping itself to support student conversations can significantly positively impact learning in terms of individual and group achievement (Brennan, 2020). Besides a positive impact on learning, CSCL has the potential to improve students' knowledge of the topic learned collaboratively (Stanley & Zhang, 2020).

Claims of significant improvement in examination scores have also been made, for example, by Strang (2015) and Mutdrivanti (2016), whose studies found that enjoyment of learning increased. The study conducted by Strang (2013) had the larger sample of 163 university students from two classes, which is still small for generalising, and confounding variables such as teacher, location, syllabus, materials, and examinations were controlled by being the same for both groups. The sizes of the treatment and control groups were also roughly equal in size at 81 and 82, respectively. However, their homogeneity meant that multiple ages and cultures were not well represented. A multiple regression model was able to capture 51% of the variance. Strang (2015) concluded that "Clearly,

applying a professor-led collaborative learning strategy helped students improve their exit exam scores” (p.141), and also that age and culture did not impact the scores despite the lack of variation in the two demographic factors.

A counter study to the one above by Strang (2013) was conducted by Kumar (2017), which had a larger sample. It showed that although technology added value in the collaboration under a CSCL arrangement, it was not statistically significant in having an overall effect on improving scores. This study also adopted an experimental approach, but with a larger sample of 2,434 participants. Two groups were compared: one with high and the other with less or no collaboration. Moreover, it examined 28 effect sizes in a meta-analysis of 20 studies as part of a larger 78-study meta-analysis. The difference between the two groups showed a positive effect of collaborating, but it was considered low to moderate across multiple grade levels and subject domains.

The uncertainty over the academic effectiveness of collaborative learning supports the need for further studies to confirm the situation more definitively. Some recent studies, however, are showing more promising results. For example, a positive impact on learning was established by Brennan (2020) and Stanley and Zhang (2020) on gaining knowledge. Furthermore, Trietiak (2020) defended the academic benefits that CL yields. For instance, CL “creates a student-centered approach to learning, fosters higher-order thinking and facilitates problem-solving skills”. In addition to practices such as grouping (Brennan, 2020), other fundamental enablers or facilitators of making CL/CSCL effective are covered in section 4.5. For realising the potential benefits of collaborative learning, these enablers would need to be considered and ensured.

The only study attempting to establish the effectiveness of CL in the Saudi cultural context is that by Alammar (2017), which also adopted various research methods, including written tests, but was still on a very small sample of 20 university students, all of whom were male. This study found “slightly more significant progress” among the experimental group treated with the collaborative learning method. The focus of the study was on collaborative writing, and the very small sample size makes [the findings inconclusive](#).

#### **5.2.4 Opportunities, challenges, and the suitability of the context**

Retnowati et al. (2018) highlighted the contextual benefits of collaborative learning. Their study compared the performance of 58 Indonesian students divided into two groups: one in which students worked individually and the other in which they worked collaboratively on intermediate-level mathematics problems. The students were noted for having either full knowledge or gaps in their

knowledge base. A gap meant the student understood only a single topic and needed information and learning to fill the gaps. The performance comparison showed that collaborative learning is only potentially beneficial in a certain context. Individual learning proved superior for students with complete knowledge, but collaboration led to outstanding learning in the case of students having gaps in their knowledge. The collaboration, in this case, was not computer-based but in the form of teamwork and utilising social skills, so was a TCL arrangement. This study shows that the benefits of collaborative learning are more likely to be realised in certain contexts, such as where new learning needs to fill gaps in knowledge.

Besides the suitability of the context, the points in this section also raise the question of whether there are many cases where learning is preferably done non-collaboratively or where blended learning, which combines F2F or physical interaction with online activities, might be better suited. However, that is beyond the scope of this study. Social benefits of collaboration from working together and having the opportunity to support one another are apparent from studies, such as those by Tsai (2011), Johnson and Johnson (2003), and Weller (2002), who reported improved communication skills. Other positive outcomes in cognitive development, such as comprehension, have also been reported (Gilles et al., 2008; Chiong & Jovanovic, 2012), but these benefits are not exclusively attributable to collaborative learning. On the other hand, complete reliance on collaboration can be time-wasting, especially if there is inadequate preparation and goals are unclear or where there is little collaboration (Almajed, 2015). This supports the need for careful consideration when promoting collaborative learning and considering a blended approach to take advantage of CL combined with other methods.

There are proponents of direct F2F learning and distance learning through online collaboration but combining both approaches in blended learning is another possibility. Benefits of this combined approach have been reported by, for example, Rodriguez et al. (2018) in architectural education and Nicolson and Uematsu (2013). The latter arranged a mixed-methods environment involving researchers with diverse cultural backgrounds. Traditional F2F learning was combined with the provision of online collaborative environments and the widespread use of ICT for researchers around the globe. The blended learning, involving both F2F and virtual collaboration, led to the intercultural groups fostering micro-cultures and having “a deeper learning experience” (p.268).

After the start of the Covid-19 pandemic, HE institutes were urged to adapt their education programmes rapidly to online courses (Aguilera-Hermida, 2020; Almaiah et al., 2020; Burke & Dempsey, 2020; Butler-Henderson & Crawford, 2020; Deshmukh, 2020; Shire et al., 2020; Adarkwah, 2021). Consequently, empirical studies are needed to study different variables, such as

students' motivation and observed learning, to scrutinise the efficacy of online learning environments (AlMamun et al., 2020; Aslan, 2021). However, few studies have investigated CL as a fundamental strategy for acquiring competencies in a distance context. Montellanos-Solís et al. (2021), for example, analysed 45 publications on collaborative learning compiled from the Scopus, EBSCO and Scielo databases, both in English and Spanish, between the years 2017 and 2021. This research discovered that CL adds considerably to teaching and learning processes, advances the contact between students, develops soft skills and critical thinking, and encourages standards, such as responsibility, solidarity, and teamwork, and implementing tools and resources to realise personal and academic accomplishment. Likewise, Nooijer et al. (2020) explained that collaboration in online courses with a **project-based learning** background is realistic when various standpoints are considered, including the design of the course, teachers' role, and students' role. Furthermore, online collaboration appears to work when related to task aspects. Thus, sustaining a balance between course structure, such as content, and collaboration and autonomy necessitates a soft touch and a well-thought-out strategy.

Moreover, improving the programmes to be prearranged for distance learning with activities appropriate for collaboration can yield efficient outcomes in interaction. Hence, this strategy must help the teacher develop the environment in the classroom in the face of disagreement circumstances and of students' low performance, demonstrating good concomitance and evading the practice of disruptive behaviours (Fernández et al., 2021; Montellanos-Solís et al., 2021).

### **5.2.5 Summary of potential opportunities and challenges**

Table 6 below summarises the findings of studies that either support or conflict with several claimed benefits of collaborative learning. Based on this sample, it is noticeable that most of the benefits and those with the fewest disputes are social. The cognitive or academic benefits claimed for collaborative learning require further empirical investigation.

As far as CL is concerned, it is important to note that it has negative aspects for personal development. As part of this argument, Iqbal et al. (2020: 62) pointed out there are:

Several challenges that students experience in collaborative learning such as unequal individual participation in group work, lack of effective communication, free-riding and social loafing on collaborative tasks and dealing with difficult and dominant group members. These challenges can be due to inexperience in working in groups, the lack of clarity around the purpose of the group work or due to the lack of collaborative learning skills among medical students.

In terms of social challenges, social interaction is an issue. For instance, Pang et al. (2018) argued that “Effective collaborative learning was also hindered by other challenges and deficiencies arising from assuming that social interactions would occur naturally in technology-mediated learning environments”. Furthermore, collaborative learning can have a negative influence on cognitive and academic productivities in the sense that it “leads to reduced motivation and a loss of productivity if group members unequally contribute to the activity, and errors produced during collaboration can be encoded by other group members to be used on subsequent activities” (Andrews-Todd & Rapp, 2015: 182).

**Table 6: Sample of studies that support or conflict with claimed benefits of collaborative learning**

Claimed Benefit	Supporting Studies	Conflicting Studies
<b>Personal</b>		
Enhanced confidence	Chang & Windeatt (2016); Shin et al. (2019); Ginns (2000)	-
Time management/saving	Christopher (2003)	Capdeferro & Romero (2012); Almajed (2015)
Greater motivation/engagement/commitment	Johnson & Johnson (2003); Chen et al. (2018); Warsah et al. (2021)	Capdeferro & Romero (2012); Turki et al. (2017)
Improved ability to reflect	Weller (2002)	-
Personal autonomy	Kessler & Bikowski (2010)	-
Readiness for career	Yang et al. (2018)	
<b>Social</b>		
Interactive engagement /Social interaction	Boud et al. (2002); Almajed (2015); Ghavifekr (2020)	-
Trust/mutual support; community spirit	Johnson & Johnson (2003); Chang & Windeatt (2016)	-
Team working	Yu et al. (2013); Retnowati et al. (2018)	-
Pro-social behaviour	Gilles et al. (2008)	-
Improved sociocultural relations	Rogoff (2003); Kessler & Bikowski (2010)	Turki et al. (2017)
Improved communication	Weller (2002); Mohamed et al. (2008); Ablehai (2011); Chang & Windeatt (2016); Mahawan & Langprayoon (2020)	-
<b>Cognitive/Academic</b>		
Information gathering/sharing/searching	Almajed (2015)	-

Claimed Benefit	Supporting Studies	Conflicting Studies
Generation/diversity of ideas	Almajed (2015)	-
Problem solving	Dignath & Büttner (2018)	-
Effective learning	Tsai (2011); Brennan (2020); Stanley & Zhang (2020)	-
Higher-order learning/ critical thinking	Christopher (2003); Gilles et al. (2008); Chiong & Jovanovic (2012); Warsah et al. (2021)	Stolk & Harari (2014) [not exclusively]
Improved marks/grades	Tsai (2011); Stanley & Zhang (2020)	Davies & Graff (2005)
Knowledge building	Veerman (2000); Scardamalia & Bereiter (2006); Caballe et al. (2011); Noorozi et al. (2013); Yucel & Usleul (2016); Stanley & Zhang (2020)	-
Deepening understanding	Weller (2002); Siddiqui (2009); Zhu (2011)	

It has been shown that there is potential for collaborative learning for enhancing, for example, confidence (Ginns, 2000; Chang & Windeatt, 2016) and learning and knowledge building (Caballe et al., 2011). It is also highlighted that students attribute this to the structuring and sharing of information, the diversity of ideas, and interaction (Almajed, 2015). However, certain factors facilitate these to make this form of learning effective, which, according to Yu et al. (2013), are instructor support, team acquaintance and team dynamics. In contrast, Sarmiento and Stahl (2008) and Dillenbourg et al. (2009) emphasise the visual aspects made possible by CSCL tools, such as charts, maps, and simulations. These may be seen as mediating factors that contribute to making CSCL effective. The interviews and observations in the primary research are designed to provide insight into the potential for collaborative learning and the factors that enable CSCL to enhance learning effectiveness.

Given the various potential benefits of collaborative learning and the possibility of computers being networked together to sustain multiple user interactions, it is not unexpected that computers have been used to facilitate CL environments and that software is available that is specifically designed to support collaborative learning modes. Of course, digital technology use can either enhance collaboration or hinder it, depending on the hardware and software quality. Still, it is perhaps observable that digital technologies are becoming an increasingly popular tool for facilitating collaboration among learners. Collaborative learning using digital technologies is also a common method applied for learning in HE institutions in Saudi Arabia. Several studies mentioned earlier have examined the specific environment in which collaborative learning occurs (Al-Khalifa, 2010; Smith

& Aboummoh, 2013; Algami & Male, 2014; Alghamdi, 2016). A later section examines studies and tools related to CSCL, the model of collaborative learning based on using computers. This is done after first examining another important aspect of collaborative learning, namely the perceptions and attitudes of both teachers and students.

### **5.3 Perceptions and Attitudes towards Collaborative Learning**

Perceptions and attitudes of teachers and students are important to consider because they indicate the degree of willingness or receptiveness to adopting CL practices or avoiding or preventing using them. These perceptions and attitudes shape the environment in which teaching and learning occur and inform the current study's primary research.

#### **5.3.1 Perceptions and attitudes of HE teachers**

Besides instructors' abilities, their attitudes can also make a difference in the success of collaborative learning among students. Evors (2020) revealed that the most important conclusion that can be drawn regarding teachers' perceptions of CL and CL communities and processes concerns what is necessary for the collaboration to be effective. The form of CL examined in this study was TCL. In this matter, they consider relationships to be important and recommended developing positive relationships to facilitate teacher collaboration. The teachers in the study believe this requires a strong commitment, and the ability of teachers to draw upon their own experiences, particularly in terms of problem solving and creativity. The relationships must be "cooperative and collegial" and enable teachers to constantly learn from each other, and the teacher must be able to avoid conflict scenarios and accept differences in expectations and teaching styles. Teachers found these are important because strengthening educators contributes to increasing learning among students and to improving their results.

Korkmaz (2013) examined teachers' perspectives on online collaborative learning (CSCL) using a mixed-methods research design involving a large sample of 599 teachers from 11 universities in Turkey. According to the results of this study, trainee teachers were most positive in terms of their attitude towards collaborative learning. It was common among them to believe that collaborative activities have a strong potential for improving academic achievement and thereby help students to fulfil their learning responsibilities. Korkmaz's study had a large sample size of 599 instructors, from whom quantitative data were gathered and 16 interviews conducted. The results suggested that gender does not affect attitudes towards online collaborative learning, but that experience does. Notably, the instructors considered collaborative learning to improve academic achievement.

Similarly, the perceptions of teachers in a study by Zhu et al. (2010) are like those in a later study on students' perceptions in the same two cultures (Zhu, 2011), except that the power distance was the same in both. This power distance is high because teachers in both cultures expect great deference and are less inclined to equalise power distribution. It is probably the case that cultures with a high power distance are less likely to arrange collaborative learning environments that reduce the teacher's central role. In interview data collected from 60 Chinese and 30 Flemish teachers, the Chinese teachers agreed that "students should accept what the teacher presents in class" (p.154). Still, they reported enjoying a closer 'friendship' with the students simultaneously, so the two positions may be balanced in this way. As may be expected, none of the Flemish teachers supported competition, and the Chinese teachers tended to stress it more. However, social-constructivist principles were helped more by the Flemish teachers than the Chinese teachers. The last finding may be unfamiliar with collaborative learning methods, despite the suitability of group learning in collectivist cultures highlighted earlier. The conclusions of this study are important due to similarities between the Arab and Chinese cultures in terms of both being collectivist with a high power distance and competitive academic environments.

### **5.3.2 Perceptions and attitudes of HE students**

Student perceptions of collaborative learning have been examined by Zhu (2011), Alkhalaf et al. (2013), and Almajed (2015), the first two in different cultural contexts, and the study by Almajed is a comprehensive review of 19 other papers exploring students' understanding comprising 98 sets of findings. According to the students, the latter study shows that learning is enhanced by interaction, diversity of ideas, sharing and structuring information, and using knowledge from prior learning. The students also preferred to control the content and direct the group discussion. On the other hand, students reported limited time and workload, learning being hindered by the under/over-participation of group members or tutors, and group cohesion being negatively affected by inadequate preparation, lack of knowledge, academic disparity, and organisational factors such as group size and workload. Despite these limitations, many students saw the value of learning in groups. Their satisfaction in working in teams is particularly affected by team dynamics, team acquaintance and instructor support (Heng-Yu et al., 2013).

The study by Alkhalaf et al. (2013) indicates what aspects of CL contribute to student satisfaction. The students in their study, which was conducted in Saudi Arabia, reported low levels of satisfaction. Notably, in the case of CSCL, the students were not unhappy with the use of technologies or other technical aspects but were with the lack of interaction among students. When these interactions were greater, they reported their usefulness in collaborating and greater satisfaction. The results, therefore,

suggest the need for fostering greater student interaction to make collaborative learning effective. This corroborates what was found by Yucel and Usleul (2016) and Almajed (2015) on the role of interaction in CL. Ku et al. (2013) also examined satisfaction among students while learning collaboratively. They found that the satisfaction of students while working in teams is particularly affected by team dynamics, team acquaintance, and instructor support. The support that students perceive as necessary includes creating a supportive environment for CL, encouraging learners, giving clear goals and objectives, providing opportunities, organising the instruction, and providing timely resources.

The importance of the learning environment was also emphasised by Asino and Pulay (2019), especially in terms of how furniture is arranged and the available space. More factors that could lead to satisfaction during CL were identified by Kleynhans and Roberson (2018). Their investigation of students' experiences of CL methods revealed the importance of a learning environment "in which students experience a feeling of success when they master a certain task", which makes them more motivated, self-confident, and willing to study. Additionally, however, the students also mentioned the importance of having a positive attitude, and they recommended small groups to facilitate discussions and problem solving. It may be that some students prefer not to interact in larger groups. Similarly, Lee and Osman (2021), in their study of students' perceptions of online CL in Korea and the UAE, established the importance of positive perceptions. In this case, the perceptions were more likely to be positive among students whose first language was English, and also led to achieving higher scores. This could be explained by the demand CSCL places on proficiency in English.

The study by Zhu (2011) involving 364 students is informative for comparing cultures and shedding light on collaborative learning in collectivist cultures. The Western Flemish culture is individualistic, whereas Chinese culture is collectivist; Saudi culture is also highly collectivist, which means the findings for Chinese culture could be relevant to the Saudi context. Differences such as computer competence and the cultural environment seem to affect the quality and extent of collaboration. Chinese students' findings reported higher satisfaction than the Flemish students, suggesting that collaborative learning was perceived favourably in the Chinese context. Still, the lower interaction among the Chinese students could be attributed to their lower computer competence, as the Flemish students had easier access to computers and the internet and, therefore, had greater computing experience.

For Saudi Arabia and other collectivist cultures in Eastern countries where competition is also prevalent, Zhu's study suggests computer competence is a supporting factor for collaborative

learning. In contrast, a competitive environment and great power distance, which are also typical of Eastern countries, are likely to be impeding factors because they are better suited to individual (non-collaborative) and teacher-centred learning. If power distance is reduced, it is expected that lesser emphasis would be given to competition, and greater interaction would be promoted instead. Collaborative learning has potential in collectivist cultures, as it relies on the spirit of working together.

Some student opinions since the Covid-19 pandemic are also worth noting to show how they have been changing in recent times and the impact of this major global event on online CL practices. Chakraborty et al. (2020) conducted a survey involving 358 university students. The students noted that their professors had improved in their online teaching skills since before the pandemic. They also considered online education to have become more useful and helpful for their future. However, they also perceived CSCL to be stressful due to its effects on their health and social life, and, for this reason, 65.9% felt they learned better in physical classrooms. This might be explained by students missing the physical aspects of their educational experience and being stressed by the changed working conditions. Prior to the pandemic, Alghamdi (2018) reported an overall positive attitude among students towards CL, following a survey conducted at King Abdul Aziz University in Saudi Arabia in which 306 students participated. As noted earlier, however, their main concerns were with data protection, and privacy and security issues. The concern with privacy in relation to CSCL was also raised by students in the UAE (Lee & Osman, 2021).

## **5.4 Computer-Supported Collaborative Learning**

Previously in this chapter, studies on CL were examined in general, which covered both TCL and CSCL. This section focuses exclusively on CSCL by conducting a further critical analysis of literature specifically on that form of learning, given that collaborative learning in the Saudi HE context is the primary focus of this study.

### **5.4.1 The computer-based mode of learning collaboratively**

CSCL uses computer-based tools and methods specifically designed to support collaborative learning, facilitating learning with other students through computers. Such devices typically include a means of communicating, presenting learning material, and recording what is contributed and learned. This section explores some common CSCL tools and examines the issue of measuring their quality and various factors that either support or hinder their effectiveness, including learner characteristics, pedagogical aspects, and technological tools. Criticisms of relying on these tools are also examined.

Identifying these tools is of central importance to this study because they enable collaborative learning to occur, and they are the components that are combined in collaborative learning. Evidence of the use of these tools, either standalone or as part of a package, may be compared with other ways in which collaboration is being supported in Saudi Arabia. The examination of CSCL tools is also directly related to sub-research questions RQS1-3, in order to establish what potential the tools have and what opportunities they can provide for supporting collaboration.

CSCL has taken on various forms over the past few decades and has been strongly affected by developments in two key research areas: cooperative and collaborative learning, and computer-supported cooperative work (Hakkinen, 2002). Some early milestones were identified from the literature that led to the establishment and development of CSCL (see Table 7 below). Although some important actions related to computer-based learning took place earlier to lay the foundation for CSCL, the first widely known and formal recognition of this precise form of learning began in the late 1980s, when workshops were held. A pioneering monograph then appeared, which gave CSCL a theoretical basis in Vygotskian and activity theory (Cobb & Bauersfeld, 2012), and software tools to provide CSCL appeared in the early 1990s. The field of CSCL was strengthened further by a series of conferences that began in 1995. Around this time, CSCL researchers explored how computers could bring students together to work collaboratively in small learning groups or communities. By the early 2000s, CSCL tools made their appearance in integrated packages in LMSs, and, by the mid-2000s, it can be said that CSCL had become a well-established form of learning.

According to Stahl (2015), CSCL arose in the fourth phase of computers in education and followed on from the first phase of computer-assisted instruction (CAI), which began in the 1960s and involved computerised drills guided by behaviourist views of learning; the second was of intelligent tutoring systems based on cognitivist psychology, which focused on mental representations and how students process knowledge; and the third was epitomised by teaching Logo under a constructivist approach in which students build knowledge themselves. Under CSCL, the role of the computer has changed from providing instruction to supporting collaboration by providing a means for communication and a structure to facilitate learner interaction.

At the first biannual CSCL conference in 1995 (see Table 7), a shift was noted within collaborative learning practices away from the previous focus on how individuals function in a group during the collaboration to analysing the group as a unit to understand the process of how interaction properties are socially constructed. Moreover, empirical studies have been focusing less on “establishing parameters for effective collaboration” and more on attempting to “understand the role that such

variables play in mediating interaction” (Dillenbourg et al., 1996: 189). This reflects the need for more qualitative insight into the phenomenon of collaborative learning, which is what the present study attempts to do within the context of a university in Saudi Arabia.

**Table 7: Early milestones in the establishment and development of CSCL up to 2006**

Year(s)	Initiative or policy
1929	M. E. Lazerte developed a set of innovative instructional devices and methods to support teaching and learning that minimised instructor involvement (Buck, 1989).
1960	PLATO was developed at the University of Illinois, the first computer-assisted instruction system, the precursor to present-day LMSs (Etherington, 2017).
1964	An authoring system for developing computer-based online courses and lessons was devised (Khosrow-Pour, 2020).
1970	The Havering Computer-Managed Learning System was developed in London (Educational Technology Publications, 1966).
1980	Learning Manager software was released that allowed for remote connections.
1983	A workshop in San Diego promoted the idea of solving problems jointly using microcomputers (Stahl, 2015).
1988	A workshop was held that formally referred to CSCL (Strijbos et al., 2004).
1989	Another international Maratea workshop is considered by many to have marked the birth of the field of CSCL (Stahl, 2015).
1989	The first influential monograph appeared covering theory and research in CSCL by Newman et al. (1989), which was grounded in Vygotskian and activity theory tradition (Cobb & Bauersfeld, 2012).
1990s	CSCL arose in response to software that made students learn as isolated individuals (Dillenbourg et al., 1996: 10).
1993	Another monograph appeared that was directly concerned with ‘Collaborative Learning’, in which Bruffee (1993) devised a model of CSCL and conceptualised its effectiveness (Roberts, 2004).
1995	First biannual CSCL conference held (Dillenbourg et al., 1996). O’Malley (1995) published a collection of research on CSCL focused on designing computer support for CL.
1997	An Interactive Learning Network (ILN 1.5) was developed by CourseInfo LLC and installed at several academic institutions.
2000-2002	Software was developed for supporting computer-based course management and online learning, including ePath Learning, CourseWork, and Moodle.
2004	The Sakai Project was founded to develop an open-source collaborative learning environment for higher education.
2005	A conference on CSCL in Taiwan established the field of CSCL globally.
2006	The first journal was published on CSCL by Springer (then known as Kluwer) (Springer, 2021).

Sources: various, as mentioned in the table

## 5.4.2 CSCL tools

Within the context of CSCL, it is important to explore whether and how CSCL tools can be used to facilitate the processes of collaborative learning and teaching among students and teachers before then going on to look at CSCL pedagogies. Common standalone tools are identified first, which can be used to support CSCL-based collaborative learning. Examples of common technological collaborative tools that can facilitate asynchronous learning are discussion board, forums, blogs, wikis, and file sharing. Tools that have the potential to support synchronous learning are chat or video-conferencing software, interactive online whiteboards, and other real-time learning tools. In either case, collaboration is supported by enabling practices that allow for interaction and building communities and can facilitate collaboration to enhance learning. It should be noted that the tools themselves do not have the power to enhance CL; this relies on teachers' pedagogical practices, their skilful selection and use of the right tools, the creation of the right spaces, and so on, which are all conditions that can facilitate learning.

A range of digital tools are available today and have the potential to facilitate CSCL. As pointed out by Biasutti (2017), who compared forums and wikis as tools for online collaborative learning, wikis are particularly useful for developing a common collaborative document. In contrast, forums are more useful for discussing and sharing ideas. Wikis are thus characterised mainly by producing and evolving forum activities using inferencing, evaluating, organising, and supporting processes. These and other tools mentioned above can be described as follows:

- *Blogs* – Online journals created for sharing information, activities, news, opinions, and research.
- *Wikis* – used for organising information and sharing creations contributed by multiple people.
- *Discussion boards or forums* – Students usually respond to prompts by the teacher or comment on one another's posts.
- *Interactive whiteboard* – An instructional tool that provides a space for shared usage on screen like a physical interactive whiteboard.
- *Instant messaging* – Enables exchange of text-based messages in real time or near real time.
- *Web or teleconferencing* – An audio/video conferencing arrangement that is like video-based chatting and allows for real-time collaboration between users.

Some specific examples of social media-based CL tools that are used in educational institutions are Evernote for note-taking; Scribblar for brainstorming; MindMeister for mind-mapping; cloud storage services and document-sharing tools, such as Google Drive; web-based project management tools;

scheduling tools, such as CoSchedule; project management combined with to-do listing, such as Trello; communication tools, such as Slack; comprehensive research tools, such as Cyfe; commenting and feedback tools, such as DivvyHQ; Medium for draft reviewing; and GatherContent for workflow management. Web conferencing and interactive whiteboards are newer forms of collaborative learning tools, both of which enable faculty and students to meet and interact virtually, saving them travel time. This form of interaction is typically synchronous, but learning content may also be accessible asynchronously, i.e., at any time after the web conference is over. For example, multiple users can work on it with a shared whiteboard.

Collaboration between users can also be supported by online document collaboration services, such as Google Docs. Rimor et al. (2010) used a mixed-methods study to investigate the interaction patterns of 44 graduate students collaborating using Google Docs for an Open University course. Concerning the forms of collaborative interaction identified earlier in section 3.1, their findings showed that around 50% of the students' discussions did not develop further to become more complex, as they only involved simple forms of interaction. Of these, nearly half of the discussions were characterised by initiation and externalisation, and the most frequent form of collaboration was to build agreement rapidly. This explains why CSCL tools need an effective pedagogical design to achieve the purposes expected from the use of CSCL tools. For example, a skilled facilitator can modify a team's performance by functioning as a process guide for directing complicated task challenges among students. Thus, teachers can be seen as facilitators and experts in leading groups through key meetings and gatherings.

The various CSCL tools identified in this section that can support learner collaboration are commonly available in the form of standalone tools outside integrated packages, as in an LMS, so the question may arise as to whether it is necessary to integrate or embed these tools within an integrated package or use a standalone version. For example, a wiki is a popular and sufficiently effective CSCL tool for collaboration that Laughton (2011) even considered an alternative to using an integrated package (LMS) all together in an e-learning environment. This study used a quantitative approach involving a survey of students to compare approaches. Although the LMS, or LCMS as they referred to it, was preferred overall, there were some features of the wiki that "made it ideal for enhancing collaboration amongst learners... [making] it an ideal tool to support minimally invasive education (MIE)", that is a way learning in which students operate in unsupervised environments" (Laughton, 2011: 225). This shows that single CBL tools could suffice for certain purposes when using a packaged program that combines several of these tools.

Forment et al. (2010) also considered this issue for wikis by examining their usage in three universities and comparing a Wiki module embedded in Moodle 2.0 and Tiki as an independent Wiki engine. First, it was found that there is a need to balance features and usability, as there are students and teachers alike for whom technology is still challenging to use. Secondly, although independent wikis tend to be more fully featured and offer greater control, which some institutions prefer, others favour an integrated wiki for convenience (Forment et al., 2012). Finally, for an effective wiki, in either case, a need was perceived for rating to be able to classify student contributions by type.

Whichever tool is used, its effectiveness is dependent on several factors. Den Exter et al. (2012) advised that the design of collaborative learning tools be closely related to curriculum intent and pedagogical requirements, and further that clear guidance must be provided about expected activity and learning expectations and for general support to be given to users along with encouragement for strong interaction. After conducting two case studies and an ex-post evaluation, the researchers also found that ensuring flexibility in designing an integrated community for collaborative learners can lead to significant opportunities for distance learning students subject to time, pedagogical goals, and the curriculum. [The next section looks more closely at the technological affordances relating to CSCL.](#)

### **5.4.3 Technology affordances of CSCL**

An affordance describes the interactive relationship between the actor and an object, which can be affected by such conditions as the user's background, experience, and culture (Jeong & Hmelo-Silver, 2016). Technical challenges mentioned in the literature include technology use (Jung et al., 2012; Sherblom et al., 2013), slow connectivity (Muuro et al., 2014), and usability issues (Forment et al., 2010), which can be overcome through improvements in the technology itself and by the provision of suitable training.

The study findings in Jeong and Hmelo-Silver (2016) are useful for identifying seven specific affordances, following an in-depth exploration of design strategies. In particular, the study sheds light on the need to carefully select and sequence tasks and arrange for appropriate tools to facilitate collaboration. Technology typically has multiple affordances. In the context of this current study, the interest is in those affordances that can enable learners to achieve good learning outcomes. Concerning collaborative learning, these affordances may or may not help learners cope with the demands and challenges associated with online learning.

Jeong and Hmelo-Silver (2016) proposed six technology affordances in addition to engaging in a joint task for collaborative learning. These other affordances are for learners to communicate; share resources; be involved in productive processes; take part in co-construction; monitor and regulate learning; and to find and shape groups and CL communities. In short, this study supports the need for implementing appropriate pedagogical strategies and other sociocultural supports for collaborative learning, which will be explored in more detail in the next section. Salmon (2000) considered that a team-based collaborative learning process is the most convincing approach to applying learning design in an educational institution. Fox-Jensen (2021) briefly explained the stages presented by Salmon (2000) to explain a five-stage approach to teaching and learning, using various tools and methods to support student access and motivation, socialisation, information exchange, knowledge construction, and development. The stages involve using Canvas (LMS) modules, live Zoom sessions, group exercises, discussion modules, and feedback mechanisms to reinforce the learning objectives. The approach emphasises practicality, theory, history, context, and methods in the subject area of perception, colour, and composition in graphic design. The final stage involves self-reflection and critical thinking, leading to a written report that is shared and reviewed with staff feedback. Overall, the approach is designed to support a holistic and interactive learning experience that promotes engagement, collaboration, and reflection.

However, Jeong and Hmelo-Silver's (2016) study is not empirical, but is a theoretical overview, albeit a comprehensive review of various theories of collaborative learning. Furthermore, the term 'joint task' refers to something worthy of being done together in a group. It is argued that computers can provide students with rich contexts for engaging in joint tasks (Goldman-Segall & Maxwell, 2002), and, according to Kirschner et al. (2009), if such tasks are meaningful and not too difficult, effective collaboration can occur when the assignments given are complex and involve a rich problem-based context. Collaboration is also enabled by communication, as ideas and creativity are exchanged actively when various ideas come into close contact (Collins, 2016). Furthermore, communication using technology can occur either synchronously or asynchronously, allowing for interaction from any place. Therefore, all the key tools used for supporting collaboration, including chat, email, discussion forums, and video conferencing, are essentially communication tools.

The usefulness of relevant resources is that they can be pooled by group members collaboratively, thereby saving time and energy while also helping to expose ideas (Jeong, 2013). These resources may, for example, take the form of documents, documentaries, interviews, and videos, with annotation tools complementing the facilitation of their sharing. In addition, annotations help students in their learning, especially when shared across groups (Hwang et al., 2007). Of these resources, video

watching is proving immensely popular (Leijen et al., 2020), and this has been shown to increase self-confidence in students (Kurata et al., 2019) and support teachers' professional development (Ramos et al., 2021).

Likewise, consistency or suitable structuring is also necessary for arranging collaborative activities to prevent digression and reflect the students. For this purpose, computer-based collaborative learning has the potential for promoting collaborative learning activities productively (Noroozi et al., 2013). For example, predefined scripts can assist learners in forming groups, defining roles, and developing appropriate modes of communication.

Arranging this collaboration via a computer offers the advantage of preventing errors, especially for complex tasks, due to the lower cognitive and social demands (Nokes-Malach et al., 2015), as well as helping students to remember past discussions and what has been co-constructed previously (Sarmiento & Stahl, 2008). Good examples of this are computer-based representational tools, such as visual charts, maps, and simulations, which can thus provide enhanced collaboration. For instance, the use of export functions allows learners to share snapshots of dashboards as well as to invite other users to collaborate. These tools have been shown to have strong potential in supporting the co-construction of knowledge (Dillenbourg et al., 2009). Similarly, computer-based collaboration tools, such as wikis and shared editors or workspaces, can provide dynamic and persistent representations of discussion (Overdijk & van Diggelen, 2008).

Monitoring and regulation are particularly important for supporting computer-based collaborative learning because technology provides more opportunities for interaction than F2F interactions (Lajoie & Lu, 2012). In addition, collaboration adds further complexity due to the need to support knowledge sharing and coordination between members (Jarvela & Hadwin, 2013). Therefore, programs, such as automated tools for text analysis and chat messages, and instructors often use discussion to monitor and regulate learners, although it is hard to track lurkers on a course because of their near invisibility. Beaudoin (2003) advocated that without proof of visible activity, one might accept that learning is unlikely to happen. In contrast, Beaudoin contended that learning can also take place when learners are involved as observers of others' activity. However, these can also help learners monitor their collaboration.

Finally, with the help of technology, teachers could aid learners in finding other learners or putting them in suitable groups to work according to competence level, gender, or other factors. Sustaining engagement is a further challenge due to the lack of F2F contact (Fields et al., 2016), but this may be

overcome, for instance, by incorporating social learning (Greenhow & Robelia, 2009) and specific feedback (Janssen et al., 2007).

It is also still the case that the relative importance of CSCL tools would depend on the background and context in which the CL environment is arranged, as well as pedagogical factors relating to how these are deployed, perceived, and experienced by educators and students alike. Notwithstanding the relevance of the various tools for supporting online collaborative learning, one also needs to consider the various pedagogical issues underpinning CSCL. The next section will consider the perceived opportunities and challenges of using CSCL tools and addressing challenges, which “requires careful selection of the learning task, sequencing of activities, and arrangement of technical and social tools to support knowledge co-construction” (Jeong & Hmelo-Silver, 2016: 261).

### **5.5 Pedagogical issues relating to CL and CSCL**

Both CL and CSCL share similarities in terms of their pedagogical approach. Both approaches emphasise the importance of social interactions among learners, and both encourage active participation and engagement. In both CL and CSCL, learners work together to achieve a common goal, and they are encouraged to share their knowledge and expertise with each other. However, although CL and CSCL share some similarities, there are also some key differences between the two pedagogical approaches. CL is focused on F2F interactions among learners, whereas CSCL involves the use of technology to facilitate collaborative learning. In CSCL, learners may be located in different physical locations and communicate via online platforms. Another difference between CL and CSCL is the level of structure and guidance provided to learners. In CL, learners are often given a specific task or problem to solve, and they are left to work out the details themselves (Dillenbourg, 1999). In contrast, CSCL often provides more structure and guidance to learners, with the use of online tools and resources.

Despite the benefits of CL and CSCL, there are also some challenges associated with these pedagogical approaches. One of the main challenges is the need for effective communication and collaboration among learners. In CL, learners may face challenges in working together if they have different communication styles or if there are conflicts among group members. In CSCL, learners may face challenges in communicating effectively online, particularly if they are not familiar with the online tools and platforms used for collaboration. Another challenge associated with CL and CSCL is the need for effective assessment and evaluation. In CL, it can be difficult to evaluate individual contributions to group work, and it may be challenging to assess the overall effectiveness of the collaborative learning experience. Similarly, in CSCL, it can be difficult to assess the quality

of online interactions and the extent to which learners have achieved their learning goals (Kirschner & Erkens, 2013).

### **5.5.1 Pedagogical and classroom aspects**

As pointed out by Westbrook (2012), the success of any initiative in promoting collaborative learning that involves the use of media tools for enhancing students' learning ability depends not only on the students, but also on the instructors' ability. For instance, instructors usually play an important role in making online collaboration possible and guiding the discussion between their students (Geiss & Roman, 2013). Scripting CSCL has also been shown to enhance learning greatly, but diminishes learner agency and undermines learner motivation (Radkowsch et al., 2020). By 'scripting', Dillenbourg and Jermann (2007) explained it as the way students have to collaborate: task distribution or roles, turn-taking rules, work phases, deliverables, etc. This contract may be conveyed through initial instructions or encompassed in the learning environment. At the same time, other studies have shown evidence of a lack of adequate knowledge and skills among teachers, instructors, and lecturers to enable them to incorporate online technologies for supporting collaboration (Orehovacki et al., 2009).

As mentioned earlier, training improvements in teachers' professional knowledge and skills could help make CSCL more effective (Quackenbush, 2020). Certain course design measures can also optimise CL. Based on the outcome of their study to examine ways of optimising CL in online courses, Nooijer et al. (2021) made several recommendations in this regard. They recommended constructing learning tasks in which students must reach a shared goal, using scripts to structure communication and activities, arranging for discussion on the team process, using existing communication tools, facilitating learner autonomy, managing expectations, providing feedback to students, for teachers to maintain an online presence, and for students to know their fellow students and contribute to creating a positive learning atmosphere. In short, they stressed the need for a balance between learner autonomy and course structure combined with active monitoring. Notably, many of these measures are designed to structure the course and motivate or engage collaborative learners and were also suggested by Zanjani et al. (2016).

The above indicates several challenges that must also be identified, examined, and solutions considered for them. Therefore, facilitating and supporting collaboration necessarily involves knowing potential difficulties and overcoming them. Furthermore, it is important to consider these challenges because the way in which a collaborative learning strategy is implemented could inhibit its adoption (Posey & Lyons, 2011). The skills required for effective collaborative learning may also

be challenging in themselves, and there is no guarantee that students will have positive experiences in learning collaboratively (Naykki et al., 2014).

For example, although a wiki can support collaborative learning, its usefulness depends on the learning design for the wiki to be effective. Zheng et al. (2015) researched a design-based approach to develop strategies suitable for wikis to support collaborative learning. Their recommendations were to involve teacher scaffolding, inquiry-based topic selection, and evaluate students and the wiki technology. Similarly, Jarvela et al. (2015) emphasised the importance of socially shared regulation of learning (SSRL). The idea is that for successful collaboration in a CSCL context, there must be “targeted support for promoting individual self-regulatory skills and strategies, peer support, facilitation of self-regulatory competence within the group, and SSRL” (Jarvela et al., 2015: 125). They note that such cognitive, social, motivational, and emotional aspects dealing with how we learn tend to be neglected in CSCL arrangements. Consequently, they recommended three key design principles to support SSRL: (1) increasing learner awareness of the learning process; (2) externalisation of this process to promote sharing and interaction; and (3) prompting the acquisition and activation of regulatory learning processes.

With regard to the pedagogical implications this can have for CL, Qiu et al. (2012) examined the impact of this factor on the reading and writing loads of students enrolled in graduate courses, which they were taking online through collaboration. As expected, large class sizes corresponded with a greater quantity of notes, which the students had to read or write, and there was a negative correlation with their academic scores. It was concluded that students are more likely to experience information overload in large classes, which compelled them to be more selective in their notetaking. Consequently, the researchers recommended minimising class sizes to increase the likelihood of higher-quality collaboration. They stipulated an optimum size to range between 13 and 15 students. A related factor is the classroom environment, especially in the case of F2F CL or synchronous CSCL within the same class, and particularly in terms of furniture layout (Asino & Pulay, 2019). Although the researchers could not be conclusive on the ideal layout due to conflicting results, they made a valuable contribution to the field by highlighting the link between classroom space and learning.

A common ingredient of successful collaborative learning experiences appears to be feedback (Forment et al., 2010; Guasch et al., 2013; Muuro et al., 2014; Alammar, 2017). Muuro et al. (2014) investigated a range of components of online collaborative learning perceived to be challenging by learners in higher education institutions in Kenya, by surveying 210 students from four universities through email. There were four challenges regarded as high and major: lack of feedback from

instructors and peers, absence of time to partake, issues with internet connectivity, and low or no involvement of other group members. This also points to the importance of proper group formation in CSCL, which Sadeghi and Kardan (2016) highlighted as having a key role in achieving pedagogical goals.

Effective CL depends also on monitoring students' progress and providing timely and constructive feedback. For instance, the importance of feedback in CL is supported in a study by Guasch et al. (2013), who considered several ways of improving the quality of collaboration by investigating the effects of giving different types of feedback. They determined that epistemic or epistemic plus suggestive feedback works best by improving the quality of collaborative performance the most. The 201 students in their study were in the final year of their bachelor programme, and data were collected using a quasi-experimental design while the students wrote an essay. Collaboration among the students was ensured by giving a guide beforehand containing detailed information about steps that facilitate collaboration, with examples and monitoring during the experiments. Notably, the impact was significant, and epistemic feedback proved to be more effective than suggestive or corrective feedback. This study shows that feedback can be given effect even under a collaborative learning arrangement and in a way that can support performance.

### **5.5.2 Interaction and engagement**

Interaction is communication between students, facilitators (teachers and educators), and technology. The purpose of interaction in a collaborative learning classroom is to keep the programme moving, make sure participants are paying attention, and clarify misunderstandings. Thus, interaction provides feedback to all involved and focuses on information. In turn, the purpose of collaboration in a classroom is to ensure learners achieve the desired level of content mastery while working with others. In this way, if interaction keeps learners interested, collaboration stimulates intellectual engagement and encourages true learning. Despite incorporating various communication and multimedia tools in integrated packages to entice users to adopt these new online educational environments, several previous studies have investigated learner motivation and engagement (Heaton-Shrestha et al., 2007; Capdeferro & Romero, 2012; Zanjani et al., 2012). Furthermore, although some have reported the building of learner communities networked through an integrated package (Pishva et al., 2010), these packages are also commonly treated merely as repositories for notes, readings, and slides (Carvalho et al., 2011). Liaw et al. (2008) thus emphasised the importance of designing learning tasks with promoting collaboration in mind and supported by engagement.

Zanjani et al. (2016) pointed out that making suitable arrangements to engage users beyond providing technological tools that support collaborative learning is necessary. *Pedagogical strategies that support engagement interaction and collaboration make the learning process easier and encourage the involvement of participants.* Their study also highlighted the importance of changing teaching habits in line with the demands of online education, designing more interactive activities, maintaining consistency, and creating appropriate tasks and procedures for assessment to promote engagement. These important findings were derived from 74 interviews with lecturers and students in various disciplines at an Australian university. The method of interviews proved to be effective in this study for identifying critical factors mentioned further below and explaining why they are important based on users' personal experiences. However, the study was focused on finding ways of improving interaction and engagement, without examining the possible impact on performance which would indicate how effective engagement can be.

Gebre (2012) did consider engagement being effective, based on university professors' conceptions of effective teaching and their perceptions of students studying in technology-rich classrooms. The findings were also reported in a study by Gebre et al. (2014) based on surveys of students and interviews with lecturers, as in this present study. Thirteen professors were interviewed and 232 students participated in the survey. Student engagement was strong when the lecturers perceived the need for students to be independent and self-reliant and at its lowest when effective teaching was seen as only entailing the transmission of knowledge. This makes these studies useful for identifying the relative strengths of different factors in student engagement, while also identifying different dimensions of engagement and highlighting implications for designing effective technology-rich learning environments.

Notably, the lecturers in the above study by Gebre et al. (2014) regarded collaboration, along with communication and discussion in general, as social activities in which the role of computers is limited. In contrast, computers were perceived as useful mainly for modelling and data analysis. This suggests the lecturers were accustomed to traditional forms of teaching, as they did not consider computers to have an important role in promoting collaboration. However, they did link engagement and collaboration with effectiveness in teaching. The lecturers were positive about collaboration in a social non-computer-based setting. Still, if the collaboration makes teaching effective, computers merely provide tools to continue collaborating with fellow students and instructors. Therefore, this present study could be justified in considering the potential of computer-based collaboration.

### **5.5.3 Pedagogical issues relating to CSCL**

CSCL is an approach to learning that holds much promise, but it is not without its pedagogical challenges. Designing effective CSCL environments, balancing the teacher's role, developing effective collaboration skills, and ensuring equity and inclusivity are just some of the pedagogical issues that need to be considered when implementing CSCL. Therefore, it is essential to take a thoughtful and deliberate approach when designing and implementing CSCL environments to ensure that learners can maximise their learning outcomes.

#### ***5.5.3.1 Perceived opportunities and challenges of using CSCL tools***

This section highlights a selection of the claimed benefits of using CSCL tools and their effectiveness for learning and examines why some are opposed to using them. Considering the benefits of using the CSCL tools identified above is important because this can indicate the extent to which **teachers are experienced at** facilitating collaborative learning. It is also useful to see whether teachers' potential is being realised or not, and, if not, it could be suggested to justify the use of CSCL to support collaborative learning.

Considering a wiki tool as an example, Hewage and Perera (2013: 51) explored "the effectiveness and pedagogical implications of integrating wikis into the curriculum and the subsequent learning outcomes". NVivo software was used to analyse wiki-generated data and the subsequent text of 30 sets of assignments collected using a triangulated approach. The findings from this study are noteworthy because both positive and negative experiences were related and due to the use of interviews to understand the pedagogical implications further. Furthermore, the results that wikis promote collaborative learning, as well as discussions and independent thinking, are consistent with other studies, such as Augar et al. (2004), Forment et al. (2010), and Laughton (2011).

In a study by Lin et al. (2018), which compared the use of a wiki for supporting collaborative learning in a course on programming to a control group that did not use a wiki and relied on F2F collaboration, the wiki was found to be effective in assisting collaborative learning. Features such as history edits enabled the students to reflect more deeply, and other tools helped illuminate certain procedures useful to understanding programming. Moreover, learners in the wiki group achieved higher program implementation. However, the greatest benefit of a wiki was observing dynamic processes in programming, which promoted the acquisition of procedural knowledge. Compared to F2F teaching, these visual benefits for presenting dynamic information and aiding procedural knowledge can generally apply to computer-based tools. A wiki combines them with the facility for collaborative learning.

On the other hand, the effectiveness of wikis in the study by Hewage and Perera (2013) was mediated by the need to ensure the alignment of goals with the curriculum and prevent discussions from stagnating. This would require the wiki to be designed effectively as well as other instructor inputs indicated by findings in Zheng et al. (2015). Any deficiencies with the wiki design and support could result in some students not being actively engaged and superficial contributions (Judd et al., 2010). Deters et al. (2010) collected data on the perceptions of 40 students through surveys and by assessing their written reflections. Although the overall perceptions of wikis were positive, with most participants reporting experiencing them to be beneficial, some negative login perceptions were also present. However, the 15 participants who mentioned disadvantages also described themselves as uncomfortable with using new technology, explaining their disposition. Concerning the fourth research question of the present study, this shows that motivational and perceptual factors can influence the extent to which CSCL tools affect collaborative learning.

The findings from the above studies confirm there are two conflicting positions on using wikis as CSCL tools. Some studies recognise their benefits, but others show justifiable reasons for not using them. From the perspective of the benefits, one reason for not using a CSCL tool for collaborative learning might be seen as due to resistance. For example, EitSo has genuine limitations to using wikis as a CSCL tool, making them unsuitable for supporting collaboration or potential benefits. On the other hand, there is only an unwillingness to use wikis by some students.

Challenges and barriers to learning collaboratively were examined earlier in section 4.4.4. The phenomenon of resistance was explored by Yusop and Abdul Basar (2016), who showed the importance of considering resistance to and limitations of CSCL tools alongside the factors that promote them. The participants in their study were selected purposively to facilitate a qualitative enquiry into resistance to using wikis based on 24 written reflections, wiki logs, interviews, and observations, so the range of methods used was diverse and sufficient for gaining an understanding of the phenomenon. It was found that resistance was attributed to a combination of individual and technical factors, but that individual factors caused the strongest opposition. Personal factors included lack of commitment, mental perceptions, and anxiety in technology use, and technological factors included user-friendliness and internet connection issues. These kinds of aspects are explored further in section 4.5.

### ***5.5.3.2 Characteristics of CSCL tools***

An important issue in pedagogy involves CSCL tools and identifying their characteristics concerning how well they support the CL for which they are designed. Several studies have been conducted on

the quality of CSCL-based collaboration. For example, some studies have examined collaborative competence, which may be quantified as being at a high, medium, or low level, as done by Muuro et al. (2014). Table 8 below summarises some chief characteristics of these three levels of competence. This approach is suitable for measuring the quality of CSCL tools because the traits are recognisable. Furthermore, in some cases, the quantifiable frequency of how many students log in also makes it possible to distinguish between the three degrees or extents to which these students logged in either to observe only or to participate in the collaboration process.

**Table 8: Characteristics of different competence levels in using CSCL tools**

Collaborative Competence	Chief Characteristics
High	Frequent login, participation, and interaction; High level of interdependence, synthesis, and dependence.
Medium	Frequent login, participation, and moderate interaction; Moderate interdependence, synthesis, and dependence. Assistance is needed for the learner to move to a high level.
Low	The student logs in but rarely participates, no indication of interdependence, synthesis, and dependence. The learner needs immediate attention to improve to the medium level.

Source: Muuro et al. (2014) (adapted)

The classification system above is based on analysing the characteristic of synthesis during the collaboration process, instead of interdependence and independence. As a consequence of learning in groups, the knowledge gained is processed further, which has been demonstrated to outperform individual learning (Brindley et al., 2009). This could be the case because the researchers see synthesis building upon the other characteristics. All three characteristics mentioned above are performance indicators of the outcome of CL that can be ascertained, for example, by discussion forum rating scores, scores of participants on a quiz or written test relating to the forum, or simply counting the number of new posts and replies in the forum. Another possibility that might be more useful or complementary would be to indicate the ‘amount’ of collaborative learning based on the quantities measured. The collaboration characteristics were grouped into those that gave indications of (1) interdependence, (2) independence, and (3) synthesis (see Table 8).

Indications of the quantity and quality of collaborative learning have also been obtained in other ways. For example, Muuro et al. (2014) compared the impact of an intelligent grouping algorithm used to indicate learners’ collaborative competency to the grade point average (GPA) method and a random method. This could help demonstrate further how well CSCL tools and integrated packages help

develop the ability to collaborate among learners. The package examined can form heterogeneous groups based on collaborative competency. The researchers used an experimental design methodology. Although similar collaboration problems were experienced across all groups, it was found that instructors were more likely to adopt the intelligent grouping algorithm. Its advantages in group formation are attributed to its heterogeneity, dynamism, and relatively little instructor involvement. The preference for heterogeneous grouping can provide constructive controversy (de Faria et al., 2006). Using intelligent techniques over other methods can incorporate learner characteristics, such as learner profiles, learning styles (Liu et al., 2009), and contextual information (Messeguer et al., 2010).

The study by Muuro et al. (2014) supports the importance of incorporating collaborative work in instructional design and the potential benefits of group learning through collaboration. Other similar findings supporting the importance and benefits of collaborative learning were highlighted earlier in section 4.2. Regarding the methodology and validity of the above result, the study randomly assigned a small sample of 108 students into three equally sized classes to reduce the potential effect of extraneous variables. Furthermore, internal validity was enhanced further by using the same learning environment, validating each instrument, pre-testing and post-testing, informing students about the purpose of the study, and implementing the same instructional material. This shows the researchers were careful about ensuring validity, but a larger sample and replication of the study in different contexts would be necessary.

### ***5.5.3.3 Monitoring collaborative learning***

To establish the effectiveness of collaborative learning, it would be necessary to measure, analyse, or monitor this form of learning. The several studies that detail or review their procedure of analysis include Miller et al. (2007), Persico et al. (2010), Caballe et al. (2011), Medeiros et al. (2013), Echeverria et al. (2016), and Haataja et al. (2018). These and other such studies can be classified according to whether they tracked data in real time and whether a special tool was used to do the monitoring. All procedures and tools focus on characteristics of the interactions, such as number/amount, relevance, duration/interval, and keyword content. At the same time, some studies also examined certain behavioural effects, such as the degree of responsiveness. Many of the studies above combined content analysis and observations with other research instruments, such as questionnaires and interviews.

An example of a study in which data were tracked in real time is Miller et al. (2007). The interactions were logged in a MySQL database using a Virtual Classroom tool, which provided the advantage of

searching through and filtering the records. Another tool used for analysing interactions in a collaborative learning environment and specifically supporting the need for teachers' awareness was the Amadeus-SIMA, described as being easy to use (Medeiros et al., 2013). The study by Caballe et al. (2011) is notable for its large sample size of 700 university students from three courses monitored and provided timely feedback and evaluation, which supported collaboration. The tool used was a discussion forum that was "an ad hoc web-based structured collaborative learning system" (p.1375), and the results showed that "learning and knowledge-building may be greatly enhanced by presenting selected knowledge to learners as for their particular skills exhibited during interaction" (p.1372). At the same time, the tool also supported the teachers in monitoring and evaluating the discussions.

Given the importance of knowledge building as an outcome of collaborative learning, ways of representing knowledge organisations have also been devised (Namdar & Shen, 2018). Namdar and Shen (2018) developed a model incorporating textual and pictorial modes and a concept map in which knowledge entries were interlinked and found there to be a high knowledge-base density. Their results established the usefulness of such a model and its three representational modes in providing a comprehensive knowledge base.

Although CL has the potential to develop students' social skills and enhance learning outcomes, there are several pedagogical issues that need to be considered when implementing collaborative learning activities with the use of digital tools. There are issues that are pertinent to both CL and CSCL while some other issues only relate to CSCL, and these will be discussed separately in this section. Furthermore, Salmon (2000) proposed that team-based collaborative learning is an effective approach for learning design in educational institutions. Fox-Jensen (2021) explained how this approach was applied to the Graphic Design and Media course methods module in five stages:

1. Access and motivation through Canvas (LMS) modules and live Zoom sessions.
2. Socialisation through Zoom breakaway and entire class discussions.
3. Information exchange through mood board creation using Padlet and communication dialogue tools.
4. Knowledge construction through group exercises and exam presentation.
5. Development of knowledge through self-insight and critical reflection via written report sharing and staff feedback.

### 5.5.3.4 Summary of pedagogical processes and issues

This section identified a range of potential facilitating factors in collaborative learning. Table 9 summarises the pedagogical processes and issues that underpin CL found in this section based on the literature reviewed.

**Table 9: Summary of pedagogical processes and issues of collaborative learning and supporting studies**

Aspect	Facilitator	Supporting Studies
Teachers	The interactive attitude of instructors	Selim (2007); Cho & Cho (2014)
	Technical capabilities of instructors	Carvalho et al. (2011); Westbrook (2012)
	Teachers' perspectives	Gebre et al. (2014)
	Teaching experiences	Lawrence & Lentle-Keenan (2013)
	Belief in ICT	Dias et al. (2014)
	Maintaining an online presence	Nooijer et al. (2021)
	Teacher scaffolding	Zheng et al. (2015)
Environment	Positive learning atmosphere/suitable environment	Asino & Pulay (2019); Nooijer et al. (2021)
	Small/appropriate classes/groups	Bruffee, 1993 (no more than five); Qiu et al. (2012) (13-15 in a class); Sadeghi & Kardan (2016)
Prior learning arrangements	Engagement incorporated in the design	Liaw et al. (2008); Zanjani et al. (2016)
	Giving students a shared goal	Nooijer et al. (2021)
	Scripting CSCL	Radkowsch et al. (2020) (although it undermines motivation); Nooijer et al. (2021)
	Suitable/meaningful tasks/sequencing tasks and roles	Kirschner et al. (2009); Godat (2012); Jeong & Hmelo-Silver (2016)
	Inquiry-based topic selection	Zheng et al. (2015)
	Taking students' thinking styles into account	Gu et al. (2017)
Arrangements during CL	Interactive activities/communication support	Jeong & Hmelo-Silver (2016); Zanjani et al. (2016)
	Monitor learning/active monitoring	Jeong & Hmelo-Silver (2016); Nooijer et al. (2021)
	Encouragement of risk-taking	Cowan & Astall (2010)
	Incorporating social learning	Greenhow & Robelia (2009)
	Guiding students' discussions	Geiss & Roman (2013)

Aspect	Facilitator	Supporting Studies
Arrangements after CL	Giving feedback to students	Janssen et al. (2007); Forment et al. (2010); Guasch et al. (2013); Muuro et al. (2014); Alammari (2017); Nooijer et al. (2021)
	Assessment procedures, appropriate student evaluation	Zheng et al. (2015); Zanjani et al. (2016)
Tools and resources	Adequate tools to support CL	Jeong & Hmelo-Silver (2016); Zanjani et al. (2016)
	Tools that support discussions	Overdijk & van Diggelen (2008)
	Representational/visual tools/video resources	Dillenbourg et al. (2009); Leijen et al. (2020)
	Annotated resources	Hwang et al. (2007)
Training	Sufficient training of students	Dias et al. (2014)
	Professional training of teachers	Quackenbush (2020)
Capabilities of students	Prior knowledge of the subject	Korkmaz (2013)
	Capability to use a CL tool	Fomsi & Njoki (2011)
	Independence/self-reliance	Gebre et al. (2014)
	Self-regulatory skills/competence (through awareness and other means)	Jarvela et al. (2015)
	Students' previous experiences	Jeong & Hmelo-Silver (2016)
Personal/social aspects (students)	Intra-group emotional support	Hernandez-Selles et al. (2019)
	Managing students' expectations	Nooijer et al. (2021)

Table 10 below summarises the challenges categorised according to shared aspects (personal, pedagogical, technical, and others with limited control or environmental conditions) and the supporting studies for each. Notably, the challenges experienced would vary according to several factors, such as the availability of the technology used and which learning activities are used. However, there is also empirical evidence of no perceived challenges when learning online collaboratively (Muuro et al., 2014).

**Table 10: Summary of challenges in collaborative learning and supporting studies**

Aspect	Challenge (/Lacking)	Supporting Studies
Personal	Stress	Jung et al. (2012)
	Feedback from teachers/peers	Kim et al. (2005); Muuro et al. (2014)
	Frustration	Cabble (2010); Capdeferro & Romero (2012)
	Lack of motivation/engagement	Heaton-Shrestha et al. (2007); Rienties et al. (2009); Forment et al. (2010); Liu et al. (2010); Zanjani et al. (2012); Capdeferro & Romero (2012)
	Self-confidence	Godat (2012)
Pedagogical	Instructional design	Jung et al. (2012)
	Large class/group size	Qiu et al. (2012)
	Classroom environment	Asino & Pulay (2019)
	Participation by other learners	Rienties et al. (2009); Forment et al. (2010); Chiong & Jovanovic (2012); Muuro et al. (2014); Jung et al. (2012)
	Readiness of students/self-efficacy	Fomsi & Njoki (2011); Jung et al. (2012)
	No F2F contact (CSCL)	Fields et al. (2016)
Teachers	Lack of adequate skills	Orehovacki et al. (2009)
Technical	Slow connectivity	Muuro et al. (2014)
	Technical support	Jung et al. (2012)
Other	Lack of time	Liu et al. (2010); Muuro et al. (2014); Almajed (2015)
	Group management-related difficulties	Liu et al. (2010); Capdeferro & Romero (2012)
	Communication issues	Kim et al. (2005)
	Cultural differences	Zhu (2011)

Nevertheless, pedagogy is more than teaching in the sense of methods implemented in the classroom. For example, when considering the purposes of the curriculum and the needs and developmental stage of students, pedagogy tends to focus on the most appropriate methods to promote effective learning in particular contexts. Therefore, it lies at the core of what it means to be an excellent teacher. In this regard, Sawyer et al. (2006: 2) claimed that “stimulating and sustaining productive student interaction is difficult to achieve, requiring skillful planning, coordination and implementation of pedagogy”. Along similar lines, Conole et al. (2011) indicated that “Designing effective CSCL processes is a complex task that can be supported by existing good practices formulated as pedagogical patterns”. The difficulties faced by education in Saudi Arabia led educators to talk about a framework for

effective education, to simplify the problem and limit it to a specific structure. Consequently, technology is now a major part of the classroom and smart boards may have replaced traditional boards. In addition, CSCL seems to be adopted in Saudi HE, but the basic premise remains the same. The teacher is still a vital facilitator for these technologies to be effective. The teacher's role will not only be to impart knowledge, but also to identify the student's strengths, interests, and values. Their primary job will be to guide students in areas where they need guidance as inventors, but also act as facilitators to support students in developing the way they think and learn. Moreover, teachers develop learning plans for students to acquire all the skill sets needed to adapt to any career model that emerges. Saudi HE expects that teachers need to rethink teaching and curriculum in ways that enable students to customise their tracks. It is also expected that there will be an increase in teachers' knowledge of educational technology content, including its three main components: technology, pedagogy, and content.

In this case, Fullan (2007) recognised five levels through which the change process would be influenced or hindered in education. These include the teacher's, the principal's, the student's, the parent's, and the community and region's administrative level of operations and management. However, as this study concentrates on the experiences of teachers and students, the focus will be much more on teachers as change agents and somewhat on the community, bearing in mind that students' perceptions have already been covered in this research and mainly in the literature review. Fullan's work explained that teachers are one of the crucial stakeholders involved in the formulation and implementation of the reform process in any education system and thus bring change. Regrettably, notwithstanding that teachers capture a vital place of influence, the flexibility to influence the education and learning systems is limited structurally and legally. This is the same situation in the Saudi educational system because the teacher's potential is not fully exploited in many ways. Therefore, "teachers are not only less involved in the development of the materials they have to use in their profession such as the development of the curriculum, but they also work under rules and regulations with some demanding too much loyalty than necessary" (Ivypanda, 2020). The conclusion reached by Fullan's work centred on challenging teachers to find ways through which they can access the different areas or fields and bring change to the system.

Consequently, shared goals, and the co-construction of knowledge through interaction, can be facilitated by collaboration. This can be summarised as:

- Instructional design – Students were concerned about unclear direction and expectations, vague evaluation criteria, wrong choice of learning tasks given, lack of adequate support from their instructors, and lack of provision for any such reliance.

- Technology use – The difficulties encountered by students included technical errors and lack of technical support. They also reported problems understanding how to use the tools for collaborating and felt that the rules were inadequate in that there were either too few or too many to help them use the technology. They expressed fear in the case of a disconnection or computer breakdown.
- Collaborative processes – Students expressed dislike for waiting for other students to respond and reported having difficulties making decisions while working in groups. Their confidence levels were low concerning the contributions of different learners. Some of them also perceived a mismatch in learning styles, and their stress was also explainable by feeling pressured to work collaboratively.

Community-wise, Fullan (2007) believed that schools were unable to operate and perform all their activities without the involvement of the community. Thus, the relationship between the educators (teachers, principals, and other administrators) and the members of the community of the school is at its worse level if the communities' views are not taken into consideration during the process of creating a successful educational change activity.

Briefly, CSL and CSCL offer many exciting opportunities for learning and collaboration, but they also pose significant pedagogical challenges. To address these challenges, it is important to ensure that technology is appropriately designed and implemented, suitable pedagogical strategies are used, and informative assessment strategies are employed. By doing so, we can ensure that technology is used in a way that supports effective learning and collaboration.

## **5.6 Collaborative Learning: Facilitating Factors and Challenges**

This section follows on from the previous one on the pedagogical issues underpinning CL and explores other factors that can support or impede this form of learning, whether based on using digital technology as a tool (CSCL) or without it (TCL). It informs in particular the fourth research question related to factors that facilitate or hinder collaborative learning. It is important to examine factors that might facilitate or impede collaborative learning because they could affect the extent or quality of the learning. Challenges and success factors are discussed together because addressing the challenges can ensure success. For example, if students lack motivation, then taking steps to make them more highly motivated could lead to CL being more effective. As for identified success factors, these should be incorporated and exploited.

### **5.6.1 Supportive and critical factors**

Importantly, in the case of CSCL, merely providing digital technology tools for supporting collaboration among students does not guarantee that they will be used effectively. It is, therefore, necessary to know what the supportive and critical factors are. This section identifies several complementary or critical factors considered necessary for collaboration while learning to be effective based on previous studies. This could be useful for addressing the second research question. The factors identified which apply to both CSCL and TCL are discussed in the context of CL in general.

For promoting interaction and collaboration among learners, critical factors identified in the literature include an interactive attitude on the part of instructors (Selim, 2007; Cho & Cho, 2014) and instructors' technical capabilities (Carvalho et al., 2011). The aforementioned studies relied on surveys of students for these findings. Zanjani et al. (2016) highlighted the importance of student engagement, which is, in turn, also affected by other related factors, such as teaching perspectives (Gebre et al., 2014) and teaching experience (Lawrence & Lentle-Keenan, 2013). Simple measures, such as clarifying the purpose of tasks, maintaining consistency in design, and having appropriate procedures for assessment, may also be critical factors (Zanjani et al., 2016).

Another critical social factor besides interaction and being engaged is intra-group emotional support, according to research by Hernandez-Selles et al. (2019). This support revealed itself as “a fundamental pillar in collaborative learning” (p. 1), and it was noted that online CL tools that facilitate interaction among group members could be used to sustain the required emotional support. The researchers concluded the need “to promote a fluent and satisfactory interaction, rooted on the learning process and emotional support as well as on effective management of the online tools facilitating collaboration” (Hernandez-Selles et al., 2019: 1).

Examples of possible challenges may be students' capability, ensuring all the collaborating students participate equally, and the collaboration results in forming an effective team. Some students may find it difficult to collaborate or be unwilling to do so. The cultural environment may also pose a further unique social interaction in a highly conservative society, such as Saudi Arabia, where it is not as common as in other countries. Other challenges such as schedules and travelling present logistical challenges that may be overcome by using technological tools, as examined above. Learner characteristics are discussed next and will focus on some of the characteristics that can become barriers.

### 5.6.2 Learner characteristics

Lack of collaborative skills is a common obstacle to CL, as Le et al. (2018) found in their study conducted in Vietnam. In their interviews with 23 university students and 19 teachers from a range of disciplines, they found teachers tended to over-focus on cognitive aspects of CL and thus neglect collaborative elements, which created further obstacles for students.

The capability of students to use a tool in CSCL is very important because, without this ability, other solutions to address challenges would not apply. This was investigated by Fomsi and Njoki (2011) in terms of the 'readiness' of undergraduate students to use an online chat tool for collaborating in their learning. A large sample of 400 students was obtained at the University of Port Harcourt in Nigeria. In this case, readiness was an issue, but many students did not own a personal computer. No gender differences were noted for the sample. The situation may be different now, even in many developing countries, as more students will be likely to own computers. Nonetheless, the tool used for collaboration was too simple in this study. When using it for collaborative learning, readiness or capability should be examined for a more complex or CBL tool.

The study by Korkmaz (2013) mentioned in section 4.3.1 also identified essential learner characteristics for successful online collaborative learning. Learners must fulfil their responsibilities properly and in a timely manner and have prior knowledge of the subject. Therefore, it is advised to consider learners' ability and willingness when forming groups for collaborative learning and to prefer homogeneous groups in terms of academic achievement. This conflicts with an original conceptualisation of collaborative learning. Bruffee (1993) recommended that groups not be too homogeneous and urged five members in each group as optimal for decision making and for tasks to be open-ended. He argued that too much **heterogeneity** would not provide a basis for consensus (Roberts, 2004). As may be expected from observing collaborative interactions, the extent of participation in discussions while learning collaboratively is strongly influenced by the students' knowledge, skills, motivation, and apprehension (Sherblom et al., 2013), **as well as skilled facilitation and effective pedagogical strategies**. This finding was confirmed after surveying 91 students from two US universities. Observations may have served this kind of study better, but the results may not be considered contentious.

Dias et al. (2014: 307) made a more thorough investigation into learner characteristics suitable for collaborative learning to be effective. Specifically, they aimed to identify learner profiles that could be used in "an optimization feedback-like process to the LMS" for effective blended learning. The 36 participating undergraduate students had varying levels of learning activity in blended learning at

a higher education institution, and the data were collected through semi-structured interviews and systematic multivariate content analysis. The study results identified three particular learner profiles oriented to an interactive learning environment, teachers' beliefs about ICT technologies, and student training concerning their use of the package for blended learning. This study demonstrates that it is possible for students to be actively involved and engaged in their learning process and to ensure the co-participative blended learning environment is interactive and adaptable.

### **5.6.3 Psychological aspects**

Common psychological challenges while learning collaboratively are stress and frustration (Capdeferro & Romero, 2012; Godat, 2012; Jung et al., 2012). Although some pressure may be considered acceptable for promoting collaboration, excessive stress could lead to poor performance in learning. Other common challenges in collaborative learning are low participation (Rienties et al., 2009; Forment et al., 2010; Chiong & Jovanovic, 2012; Muuro et al., 2014) and lack of motivation (Rienties et al., 2009; Forment et al., 2010) and issues such as lack of self-confidence (Godat, 2012) may be seen as contributing to the low participation and frustration.

According to Capdeferro and Romero (2012), frustration among collaborative learners occurs due to an imbalance in commitment to the task and a lack of common goals. Hofstede (2005) suggested that stress is common in collectivist societies because they have greater uncertainty avoidance and fear of change. Tension and frustration may wane over time in Saudi Arabia as students become more accustomed to collaborative learning and gain more proficiency in using computers. Instructors can better guide learners by defining common goals and ensuring more balanced commitment. Providing adequate and appropriate roles and tasks would also be necessary (Godat, 2012).

Capdeferro and Romero (2012) found that this frustration is mainly due to the perception of an asymmetric collaboration, and because of complications in group organisation, absence of shared goals, disproportion in the commitment levels and the quality of individual contributions, surplus time spent on online chores, the discrepancy between individual and collective grades, and problems in communication. Cabble (2010) also investigated the phenomenon of frustration among students engaged in online collaborative learning to identify the sources causing them to express frustration. It was found that frustration was common in the sample of 40 students studying at a university in Spain. The main source of their frustration was their perception of asymmetric collaboration. For instance, the students experienced difficulties in communicating and managing group organisation. Moreover, there was a lack of shared goals and an imbalance in individual contributions and

commitment quality. Furthermore, the students perceived that they were spending excessive time on their online tasks, and the experience led to a wide gap between their individual and collective grades.

A feeling related to frustration is stress, which has also been examined in studies on student collaboration. For instance, Jung et al. (2012) examined stress factors faced by Japanese students while interacting online during collaborative learning sessions. The researchers attempted to determine whether a self-efficacy element explained their stress. This stress factor was found to contribute to their stress, and it may be worth noting the reason behind it, so we can learn from this study to minimise stress when preparing learning tasks involving collaboration:

- *Self-efficacy* – The students perceived that **academic achievements are influenced by the lack of self-efficacy and reported a lack of self-confidence** and reading/writing skills deficiency, especially when coming across unfamiliar jargon. They also feared expressing their opinions and preferred to receive more guidance in using English.

#### **5.6.4 Cultural context**

The cultural context is another important factor that can affect the quality of collaboration between students either by facilitating or hindering collaboration, but there are few studies in this area. Concerning the cultural or educational environment, collaborative learning tends to conflict with those with the pressure of examination, and those with high power differentials tend to create distance and interact less (Lin, 2017). Encouragement of risk-taking is also necessary to support a culture of collaboration (Cowan & Astall, 2010). The implication for all the identified challenges is that instructors and online course designers should be aware of them and alleviate their impact. On a mental level, the difference in cultural backgrounds is important because of actual differences in thinking styles (Gu et al., 2017). The researchers found the relationship between students' thinking styles and their adopted roles significant using Sternberg's thinking styles inventory. Therefore, in addition to cultural factors, teachers also need to consider the related dimension of thinking styles when implementing an appropriate CL programme and making it effective.

This situation is not unlike the Saudi context of this current study, in which exam pressure, emphasis on traditional teaching and learning approaches, and accustomed learning styles may conflict with the practice of collaborative learning. Conversely, the *guanxi* system in the Chinese group culture combines well with collaborative learning approaches because of the emphasis on communication, interaction, and collaboration. It was pointed out earlier in Chapter 2 that Arab countries also have high context and collectivist cultures, which suggests that despite the restrictive issues mentioned

therein, there is also scope at the same time for promoting collaborative learning practices. This dimension is explored further in section 2.3.4.2.

Given that this study is focused on the Saudi context, it is worth examining previous studies that examined or took the cultural context into account. One such study was conducted by Zhu (2011), which drew comparisons between the Chinese and Western contexts. This study examined student satisfaction using a collaborative learning environment by comparing Chinese and Flemish students studying in China and Belgium. To make a fair comparison, the same online learning environment was arranged for both groups, and they were given tasks involving collaboration. The cultural differences were found to be significant. Overall, the Flemish students were more satisfied than their Chinese counterparts. This may be attributable to the observation that the Flemish students spent more time online than the Chinese students. However, in terms of collaboration, the Chinese students enjoyed this aspect of the learning more than the Flemish students and were happier and more satisfied while collaborating. Importantly, both sets of students appreciated the collaborative learning experience and agreed that it helped them better understand the learning content. The findings of this study suggest that cultural factors such as the influences of hierarchy, collectivism, and being less bound by rules and traditions should be taken into consideration when preparing collaborative learning tasks.

## **5.7 Studies on Collaborative Learning in Saudi Arabia**

A few studies on collaborative learning conducted in the same sociocultural context as the current study include those by Alqurahi and Stahlke (2005), Soliman and Ismail (2010), Al-Ismaiel (2013), Alkhalaf et al. (2013), and Alammar (2017). Examining such studies could be informative for their similarities and differences with the current research and for devising an appropriate methodology for the present study.

Alqurahi and Stahlke (2005) reported on their attempt to introduce F2F CL and CSCL to Saudi students learning composition. They found no statistical significance between the CL/CSCL and non-CL/CSCL groups in terms of attitude towards collaboration or self-efficacy and academic support, which they suggested was due to CL/CSCL being a new learning method in Saudi Arabia at the time. In contrast, the study by Soliman and Ismail (2010) found a difference in that design students who collaborated in their projects developed more skills than those who worked under a traditional arrangement. It may be that five years later, Saudi students had become more accustomed to CL, or there may be some other explanation, such as the different subjects.

The studies mentioned above used various research methods to gather qualitative and quantitative data, but interviews were common to the last three. The findings from the first study show that the discussion forum is the most used collaborative learning tool (Alqurashi & Stahlke, 2005). The same studies also show that the cultural context plays an important part in either presenting challenges or being conducive to collaborative learning (Alqurashi & Stahlke, 2005). Typical challenges are lack of experience, technological difficulties, greater preference for F2F learning (Al-Ismaiel, 2013), and little interaction (Alkhalaf et al., 2013).

These challenges are similar to those found for Chinese learners by Zhu (2010, 2011). Changes over time might also be evident, as Al-Ismaiel's (2013) study suggests that Saudi students face various difficulties and are not prepared for collaborative learning. In contrast, the impression from the more recent survey by Alammar (2017) is that Saudi students and teachers alike were more receptive to collaborative learning. A notable limitation of the last study is that it involved only male students. Regardless, the present study may shed more light on this matter, as it may be that either the same challenges persist or that Saudi Arabia is now prepared for collaborative learning to become more widespread.

There are several challenges in using CSCL tools in Saudi Arabia, whether standalone or as an integrated package, so it may be necessary to examine these for their possible impact on student collaboration briefly. Standalone means separate, as in 'on its own'. Some tools are available like this, not as part of a package. A device is integrated when part of a package of tools, such as Canvas, and in LMSs. For example, a discussion forum can be added to any website as a separate component, but it is also provided in a more integrated way within, for example, Blackboard.

Alghamdi (2016), for instance, established the significance of attitude in using an LMS-based CSCL tool among purposively selected students in Saudi universities, and Bousbahi and Alrazgan (2015) found resistance to using it due to factors such as lack of motivation, load anxiety, and inadequate organisational support for students to perceive its usefulness. The finding that organisational support may be insufficient in Saudi universities is also supported by other studies (Al-Wahaib et al., 2008; Asiri et al., 2012; Alhomod & Shafi, 2013). For example, in the study by Asiri et al. (2012), it was found that LMS usage was insufficient due to a range of personal, technical, and organisational barriers, including inadequate computer self-efficacy, lack of technical support, and weaknesses in the instructional design of the software.

In addition to the above, technical issues can also affect the extent of collaboration. For example, Al-Wahaib et al. (2008) identified a lack of infrastructure and technical support as key challenges in

adopting internet technologies among Saudi university lecturers. Furthermore, in an investigation conducted by surveying 338 instructors from seven Saudi universities, Colbran and Al-Ghreimil (2013) found that technical and pedagogical delivery problems posed the main challenges to using an LMS. The issues included occasional system failures, lack of technical support, risk of viruses, inadequate training, slow internet speeds, and maintenance issues.

It is also pertinent to note from the study mentioned above by Colbran and Al-Ghreimil (2013) that almost half of the instructors were unaware of an LMS being used by their institution, which may be considered an unusual finding. Even acknowledging that the survey was conducted over seven years ago, measures may be needed to raise instructors' awareness of collaborative learning tools. If it continues to be the case that many instructors are unaware of LMS usage in their institutions, then little can be expected from students concerning using their university's LMS or any other software to utilise a CSCL tool. On the other hand, this finding could mean not all instructors were involved in managing CSCL software. Other staff may have been given that role instead, or the unaware instructors were not involved due to lack of capability. Given the scale of the claim and potentially major repercussions, this situation would need further investigation. More recent research is required to reflect the current position.

The more recent study by Alghamdi (2016) mentioned earlier also confirms that LMSs are "not actively used for most teaching purposes" (p.2309), so it might be the case that the situation has not changed. However, this finding is based on a survey of only 222 faculty members from six Saudi universities, so the results may not be generalisable, especially for making recommendations on the need for training, and the study was focused on the use of LMSs in general, rather than specifically for supporting collaboration or CL among students. Moreover, it is pertinent to note that this study used an online questionnaire to conduct an opinion poll with a small sample and poorly constructed closed-ended questions were used, some of which were biased by restricting responses to what the researcher preferred. The basis of this finding is, therefore, weak. The researcher also seems to have ignored other research that has been highly critical of the supposed benefits of CSCL software and similar technologies for supporting collaborative learning. Instead, the focus was on user-adoption models of 'acceptance' for exploring whether people were using an LMS.

Suppose instructors indeed experience difficulties in using collaborative learning tools. In that case, this may be due instead to the challenges entailed in the more fundamental shift from a lecturer-centred to a student-centred approach to teaching. Earlier, a study by Alasmari (2014) on blended learning also found there is insufficient understanding of this new role of instructors, hence promoting

interaction and collaboration among learners. However, this mixed-methods study did reveal positive perceptions towards e-learning in general, which suggests a transition process may be under way.

Al-Ismaiel and Abdulwahab (2013) found that research on online collaborative learning environments in Saudi HE is limited. The use of online tools for supporting collaborative learning is still a new concept. Therefore, it is not unexpected that the interviews and observations made in this study of student interactions while completing two collaborative tasks revealed difficulties in being sufficiently engaged and in understanding the functions within their discussions. Notably, the students preferred traditional F2F learning, as they lacked experience using online tools to engage in collaborative learning. Again, newer research is needed to survey the present situation.

In consequence of the various issues highlighted in the studies examined above, it appears that insufficient computer skills, technophobia, and change resistance are major challenges facing university staff in Saudi Arabia (Alqurashi, 2009), and training may be necessary if recommendations are to be made for improving the quality of student collaboration. Training and other forms of support would, therefore, be essential to ensure students interact and collaborate and do so in a way that is effective for their learning. Otherwise, there will remain a risk of under-utilisation or unsatisfactory use of CSCL tools. Bousbahi and Alrazgan (2015) and Alshammari et al. (2016) noted that lack of utilisation is already an issue in Saudi Arabia, despite the rapid development of countries in the Middle East.

## **5.8 Chapter Summary**

This section outlines the search findings pertaining to studies which were critically examined in this chapter. Pioneering researchers in the field of modern collaborative learning were identified as Mason (1972) and Bruffee (1992), and others who promoted the idea of learning together in the modern era include Vygotsky (1978), Dewey (Garrison et al., 2012), and Rogoff (1994). Other prominent researchers who have studied this field extensively include Dillenbourg (2009), Johnson and Johnson (2003), Rimor et al. (2010), Tsai (2011), and Chang and Windeatt (2016).

Collaborative learning is about working with other students towards a common intellectual endeavour. The goal may be to reach a consensus (Armstrong, 2011) or produce new knowledge (Tesavrita et al., 2017). Therefore, co-labouring is involved by intentional design, and meaningful learning occurs (Siddiqui, 2009). The nature of collaborative learning grounds it in the learning paradigm of social constructivism. Another fundamental defining characteristic or element of CL/CSCL was also identified in the review. CL necessarily involves interaction, of which Hernandez-

Selles et al. (2020) identified three types: social, cognitive, and organisational. Arrangements for CL are typically in the form of groups, which are usually heterogeneous (Bhat et al., 2020). It may be pursued in person and F2F, as practised traditionally for centuries, or through a computer-based tool, either together in person or from afar via an internet connection, and synchronously or asynchronously. The last-mentioned mode of learning collaboratively began in the late 1980s and advanced with the development of computer technology.

The various research papers examined in this study have highlighted several social benefits of collaborative learning, such as social cohesion (Cullen et al., 2013), social adjustment (Turki et al., 2017), improved communication skills (Weller, 2002; Alblehai, 2011; Chang & Windeatt, 2016; Mahawan & Langprayoon, 2020), and self-confidence (Kurata et al., 2019). Cognitive benefits have also been identified, such as enrichment and enlargement of knowledge and deepening understanding (Siddiqui, 2009), critical thinking and other high-level thinking skills (Gilles et al., 2008; Chiong & Jovanovic, 2012; Warsah et al., 2021), and, importantly, knowledge building (Noorozi et al., 2013; Yucel & Usleul, 2016; Stanley & Zhang, 2020) and learning (Brennan, 2020; Stanley & Zhang, 2020). On the other hand, disadvantages have also been reported, such as wastage of time (Almajed, 2015) and the benefit of conduciveness combined with the potential for conflict with certain cultures examined by Lin (2017).

The form of collaborative learning of interest in this study, namely CSCL, has also been studied previously by other researchers, such as Rimor et al. (2010), and especially wikis (Hewage & Perera, 2013; Zheng et al., 2015; Lin et al., 2018), and Forment et al. (2010) compared these with LMSs that combine several CSCL tools in a single package. Those, such as Yusop and Abdul Basar (2016), have stressed the resistance factors and limitations to using CSCL tools. Studies by Rotgers et al. (2012), for example, have also examined the challenges of using CSCL tools concerning the collaborative tools they provide. Alshammari et al. (2016) have highlighted, for example, low usage levels in Saudi Arabia, whereas others have found several benefits (Kumar & Sharma, 2016; Yucel & Usleul, 2016).

Other studies examined have identified various factors that support or facilitate CSCL, such as interactive attitude (Cho & Cho, 2014), technical capabilities (Carvalho et al., 2011), various learner characteristics (Korkmaz, 2013), and teachers' professional knowledge and skills (Quackenbush, 2020). Conversely, others have highlighted challenges, such as lack of knowledge and skills (Orehovacki et al., 2009).

Important studies in the Saudi context identified during the search include those conducted by Algami and Male (2014) and Alghamdi (2016). However, these studies focus on government policies

regarding the cultural accommodation of collaborative learning. Similarly, Smith and Aboummoh's (2013) concern was to produce more knowledge workers for the kingdom. One study focused more on collaborative learning tools in the same context as this study of Saudi higher education institutions was by Al-Khalifa (2010) and highlighted the benefits for female students and lecturers. Other studies have focused specifically on CSCL in Saudi Arabia, such as Alshahrani and Al-Shehri (2012), Al-Asmari and Rabb Khan (2014), and Alghamdi (2016), some on challenges such as technical and pedagogical delivery issues (Colbran & Al-Ghreimil, 2013). However, the situation is the same as the one Al-Ismaiel and Abdulwahab (2013) noted: a lack of research focused especially on Saudi higher education institutions' online collaborative learning environment. This is where the potential usefulness of this study comes in because it could shed more light on collaborative learning practices in this same context and the opportunities for CSCL. Based on the thorough and critical examination of the existing literature presented in this chapter on collaborative learning in the HE context, the next chapter details the methodology followed for carrying out the primary research.

## CHAPTER 6 - METHODOLOGY

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### 6.1 Introduction

This chapter details the methodology for conducting the primary research. It includes a case study comprising observations and interviews at a single Saudi university (Hail University) on collaborative learning among preparatory year students. It was noted that the structure or system of the curriculum aims to or expects students to learn collaboratively, both with and without using computers. Thus, both approaches were explored. The former is referred to in this study as computer-supported collaborative learning (CSCL); the latter is non-CSCL, since it focuses on students' perceptions and experiences of CSCL and that of their teachers. The study adopted a multi-method research design, which is detailed in the section on research design later in the chapter. This is followed by the data collection and analysis methods, including the sampling and research instruments, the [trustworthiness of the data](#), and the data analysis. Ethical implications of the study are also discussed in depth.

### 6.2 Aim, Objectives and Research Questions

This study aims to investigate the perceptions and experiences of students and teachers regarding collaborative learning. This was achieved by: (1) ascertaining how collaborative learning is deployed in the preparatory year at the selected institution; (2) exploring and examining the perceptions of students and teachers of all forms of collaborative learning deployed; (3) investigating their experiences of learning collaboratively; and (4) investigating the factors that facilitate or hinder collaborative learning generally in the Saudi higher education context, and the use of CSCL tools in particular. In line with the aim, the main objective of this study is specified as follows:

- Main Objective: To investigate how collaborative learning is deployed, perceived, and experienced by a sample of students and their teachers to support their learning and teaching in the preparatory year at Hail University.

Four sub-objectives were then set to help achieve the main objective of this study (Om):

- ObjS1: To ascertain how collaborative learning is deployed and practised in the preparatory year of Hail University.
- ObjS2: To explore the perceptions of students and teachers at Hail University towards collaborative learning with and without the use of CSCL tools.

- ObjS3: To investigate the experiences of those students and teachers at Hail University who use CSCL tools for collaborative learning.
- ObjS4: To identify and examine factors that may assist or hinder traditional (TCL) and computer-based collaborative learning (CSCL) among students.

The main research question reflects the title of this study: ‘A Case Study of Collaborative Learning among Preparatory Year Students and their Teachers at Hail University in Saudi Arabia’, which concerns both collaboration itself and how it is applied in students’ academic learning. Therefore, the research questions below are in line with the objectives listed above, whereby the sub-research questions (RQs) lead to answering the main or central research question (RQm) of this study:

- RQm: How is collaborative learning deployed, perceived, and experienced by a sample of students and their teachers to support their learning and teaching in the preparatory year at Hail University?
- RQs1: How is collaborative learning deployed and practised in the preparatory year of Hail University?
- RQs2: What are the perceptions of students and teachers at Hail University towards collaborative learning with and without the use of CSCL tools?
- RQs3: What are the experiences of those students and teachers at Hail University who use CSCL tools for collaborative learning?
- RQs4: What factors assist or hinder traditional and computer-supported collaborative learning among students?

### **6.3 Underlying Philosophy**

A paradigm consists of the three main components of (1) ontology, the study of being or what constitutes reality; (2) epistemology, which is concerned with knowledge and knowing; and (3) methodology, which is the strategy or plan of action underlying the approach and methods adopted for the research (Abdul Rehman & Alharthi, 2016). The study required exploring and understanding the perceptions and experiences of people. It is accepted that reality can be treated as objective about certain information. It is also subjective and differs between people when thoughts and perceptions are involved, since different people perceive reality differently, each with their own interpretation. Given these aspects of collaboration, the interpretivist paradigm was deemed appropriate to guide this exploration, hence the need to adopt methods in line with the interpretive paradigm. Furthermore, this approach could support both the subjectivist ontology and provisional epistemology underpinning the researched phenomenon. Concerning the underlying philosophy, both phases were

therefore guided by the interpretivist paradigm to understand the socially constructed reality of collaborative learning in general and CSCL in particular (Saunders et al., 2019).

In applying this paradigm, the ontological and epistemological assumption taken for this study was that a qualitative approach to studying the phenomenon of collaborative learning would be most appropriate for the research design. In this regard, phenomenological research is a qualitative research approach endeavouring to apprehend and define the common core of a phenomenon. The approach examines the everyday experiences of human beings while appending the researchers' predetermined statements about the phenomenon. Phenomenological research studies lived experiences to understand how people appreciate those experiences (Delve, n.d.). Therefore, the following are the assumptions underlying the adopted paradigm, adapted from those mentioned by Crotty (1998, qtd in Creswell & Creswell, 2018):

- Students interpret or construct meanings as they engage with each other collaboratively, and teachers do the same when instructing and guiding their students to learn collaboratively.
- Students and teachers engage with their learning environment and make sense of what they perceive and experience based on their previous and social perspectives. Qualitative researchers seek to understand this setting or context by visiting it and personally gathering information. In the case of the present study, this was done primarily through direct observations.
- Meaning is generated from the social interactions in the classes. Therefore, the qualitative research process is mostly inductive, and the researcher generates these meanings from the field data collected.

## **6.4 Methodological Considerations**

The interpretivist paradigm was suitable for this study due to the need to gain insight and understand the above-mentioned phenomena, rather than gathering realist objective data. It is also suitable because previous research in Saudi Arabia is comparatively less than that conducted in Western contexts, so that the insight could lead to new knowledge (Saunders et al., 2012). Educational research also attempts to reduce complex phenomena, such as collaborative learning, by simplifying and controlling variables (Scotland, 2012). Therefore, this justifies the application of this paradigm so that the social aspects of collaboration could be studied fully as a real-world phenomenon.

This section explains the sampling applied, the research instruments, their authenticity and trustworthiness, the resonances of the results and findings, and the study's limitations. The first two research questions required finding out how teachers currently support student collaboration. Next,

the facilitating factors and hindrances could be identified, and then the opportunities offered by computer-based technology for supporting collaboration for some. Finally, addressing the third and fourth questions required gaining information from teachers and students. It was thus considered appropriate to take advantage of interview methods for the reasons explained below.

#### **6.4.1 Research design**

Given the above aim of this study, its objectives and research questions, and the critical analysis of the literature conducted in Chapter 2, a qualitative research design was developed. This was employed by conducting observations and interviews and is detailed below. The interviews involved engaging directly with the subjects under study by interviewing them in person, and the observations enabled gathering data without engaging with the subjects but simply observing them (Thompson, 2016). Adopting two methods provided an additional benefit of probing for meanings by triangulation of the data obtained from applying multiple methods. In this respect, Carter et al. (2014) explained that “triangulation refers to the use of multiple methods or data sources in qualitative research to develop a comprehensive understanding of phenomena. Triangulation also has been viewed as a qualitative research strategy to test trustworthiness through the convergence of information from different sources”. For example, concerning RQS1, the observations helped uncover factors that facilitate collaborative learning, and the interviews helped confirm these factors and shed light on how they facilitate collaboration. The sequence in which the methods were applied is detailed further in section 6.6.1.

#### **6.4.2 Case study**

Since this is an in-depth study with a focus on interactions and processes involved in a particular phenomenon of collaborative learning (both computer-based and traditional non-computer-based) within a single natural setting, namely Hail University, this makes it a multiple comparative case study research, as described by Denscombe (2014, qtd in Cohen et al., 2018). Furthermore, it has a specifically ‘multiple-case design’ involving comparative research, as per Yin’s (2009) identification of case study designs in which typical, representative, or unique cases are investigated instead of a single or embedded design. It is a multiple-case study because there is more than one class involved, and the classes are of different kinds according to whether they used CSCL or not and whether a technical or non-technical subject was being taught. The comparisons are drawn in this case between CSCL and TCL/non-CSCL. Assuming that the classes examined at Hail University were typical examples of collaborative learning practised in universities in Saudi Arabia, it is still impossible to make generalisations to other universities due to the small sample included in this research. Other

researchers call this resonance (Cohen et al., 2018: 376) or “fuzzy generalisation” (Turner, 2005: 43), which suggests multiple findings lead to identifying central tendencies, and allows the conclusions of a case study to be considered as relevant in other similar settings.

Although CSCL and collaborative learning in general are global practices, the boundaries of this research have been constrained to facilitate investigation through interviews and observations. This could raise the issues of non-generalisability and non-representativeness, which are criticisms often made against case studies (Wellington, 2015, qtd in Cohen et al., 2018); but this is at the expense of the potential insight that this study could provide and the value of obtaining details of a real-life example of collaboration leading to enhanced learning. Another potential concern Wellington (2015) mentioned with case studies is a possible disruption to individual participants, but this is more likely in the case of participative research. In contrast, the researcher did not intend to be involved in the collaboration process in this study but to observe it independently.

In line with Stake’s (2005, cited in Cohen et al., 2018) recommendations on what to describe in a planned qualitative case study, the following parameters define the current case study:

- Boundary – Collaborative learning (CSCL and TCL) in a class at Hail University.
- Phenomenon – Potential of CSCL to enhance learning by students based on the comparisons made with data from TCL classes.
- Patterns in data – Evidence of initiatives, characteristics, processes, techniques, etc., while collaborating leads to enhancement in learning.
- Triangulation – Data from two research methods were compared: specifically, interviews (focus group and individual) and observations.
- Interpretations – Interpretations were drawn from the findings of the synthesised analysis.
- Generalisations – An attempt is made to generalise the findings for the benefit of instructors who employ CSCL strategies.

### **6.4.3 A brief critique of methods**

The methods adopted in this research were observations and interviews (focus groups and individual). The qualitative survey method was considered initially for this study due to the potential information to be gained from a larger sample and the wider Saudi university students. However, it would only have offered general data on current CSCL tools and how collaboration is presently being supported in Saudi universities. Therefore, interviews were chosen because of their potential in providing rich qualitative data and insight into the educational practice of collaborative learning (McGrath et al.,

2018). The interview method has been used extensively in many previous studies on collaborative learning. For instance, it was used in studies on collaborative learning in the context of the Arab world (Tubaishat et al., 2006; Al-Ismaiel, 2013; Al-Ismaiel, 2013), including the same context as this present study of Saudi Arabia (Alkhalaf et al., 2013; Almulla, 2016; Alammar, 2017); a study on cultural differences while learning collaboratively (Zhu, 2011); a study on teacher attitudes towards collaborative learning (Korkmaz, 2013); studies on students' perceptions and experiences of collaborative learning (Muuro et al., 2014; Almulla, 2016); studies on specific collaborative learning tools (Hewage & Perera, 2013), and other studies involving collaborative learning (Jeong, 2013; Dias et al., 2014; Gebre et al., 2014; Yusop & Abdul Basar, 2016; Zanjani et al., 2016).

To achieve this study's objectives, interviews were considered more likely to reveal exactly how collaborative learning opportunities can be exploited in order to be useful, which would not be conveyed in a survey. Combined with observations of collaborative learning experiences, interviews potentially provide high-quality information, especially as combining multiple methods builds on the strengths and offsets their weaknesses, improving the validity of the findings (Dornyei, 2007). Interviews allowed for greater probing into specific areas of the investigation, such as finding out exactly how teachers promote collaboration and identifying features of CSCL tools that support collaboration among students. They allowed for guided conversations with participants (Yin, 2003). Therefore, an interview was preferred as a research method because it could help gain insight into actual experiences (Saunders et al., 2012). The format of the interviews was chosen to be semi-structured to allow for open-ended and in-depth discussion and to support the exploratory nature of this research. This semi-structured format of interviewing has been adopted previously, for example, by Zhu et al. (2010), Armstrong (2011), Godat (2012), Al-Ismaiel (2013), Lin (2017), Alammar (2017), and Le et al. (2018). In Alammar's (2017) study, which was conducted in the same context of Saudi Arabia, the semi-structured format for interviewing was chosen "to gather deeper insight into the learners' experiences" and because it is "seen as one of the most useful and helpful techniques" (p.658). This makes it suitable for the present study as well. Therefore, it was deemed appropriate to obtain this information by interviewing the participants to gain insight into the thinking processes behind collaborative learning.

As for observations, these can be time consuming (LeTS, 2018), but incorporating this method to complement the interviews was due to the need to observe the collaboration while it took place. Furthermore, observations have contextual relevance (Cohen et al., 2018: 294), so this provides the advantage of gathering data from a natural setting and discerning behaviour as it occurs, especially non-verbal behaviour. Observations can also enable adding "new dimensions for understanding the

actual uses of a new technology or a new curriculum and any problems being encountered” (Yin et al., 2018: 166), and were, therefore, considered a valuable method to apply in this study. Fortunately, the collaborative learning at the selected university occurs within classes rather than remotely, making it possible to observe the students together. The aspects observed while the students collaborated are mentioned further in section 6.9.3 and listed in detail in Appendix C.

#### **6.4.4 The rationale for the adopted research methods**

The combination of interview and observation methods has been used effectively in previous research on collaborative learning in general, for example, by Al-Ismaiel (2013) and Yusop and Abdul Basar (2016). In the study by Al-Ismaiel (2013), conducted in Saudi Arabia, both methods helped uncover difficulties with collaborative tasks and engagement. However, the researcher noted the greatest advantage of doing observations is that they enable observing previously unseen or ignored facets. Their observations focused on the social interaction among students and between students and their teachers.

In other studies, one or another of these two methods has been used. For example, Forment et al. (2012) carried out participant observations. Although this allowed the research to be conducted in a natural setting to provide data of actual collaborative learning, it may have involved some interference. In the case of this current study, attempts were made to avoid interference by adopting a non-participative role. The literature review also highlighted studies that did not employ these two methods, but in which one or both would have been more suitable. For example, Sherblom et al. (2013) conducted a regression analysis showing that student knowledge is the strongest predictor of participation in online discussions, followed by communication skills, apprehension, and motivation. They recommended observations because it could enable researchers to see the way students participate and how well they do so and allow for qualities such as motivation to be noticed.

Many more of the studies examined related to collaborative learning and used the survey method exclusively (Tubaishat et al., 2006; Zhu et al., 2010; Colbran & Al-Ghreimil, 2013; Muuro et al., 2014). These studies successfully identified numerous factors and challenges in collaborative learning. For instance, Tubaishat et al. (2006) found that giving relevant and challenging assignments, receiving timely feedback from instructors, and having rich and coordinated learning environments are effective. However, a commonality among the studies is the lack of insight into this learning strategy, especially for describing how collaboration occurs and how students achieve a consensus. In addition, some of these survey-based studies also suffer from having small samples, which might

be due to difficulties in obtaining a larger sample. For example, in the Tubaishat et al. (2006) study, only 163 students were surveyed, and the difficulty was due to small class sizes.

Besides the time-consuming nature of observations (LeTS, 2018), it is also impossible to observe certain aspects, such as the thinking processes behind the collaboration. However, observations were not relied on exclusively. The shortcoming was addressed by employing interviews as a complementary method. Morrison (1993: 80) found observations useful when arranged to focus on physical, human, interactional, and programme settings. Cohen et al. (2018) mention several specific features to observe, such as keywords and symbols used, reconstructions of conversations and behaviour, events, and activities. The observations included the last three in the present study because they were potentially relevant.

With the above in mind, the observations in the current study were arranged to note points particularly related to the physical setting in which the students collaborated, notable behaviour, events, and activities, how the students interacted with each other, and how they worked towards each other completing the course. Specific factors to look for are detailed in the research design and included the following:

- Physical setting – description of the two settings (CSCL and non-CSCL arrangements).
- Participants – description of the participants relevant to the study.
- Activities – notable collaborative activities the students engaged in to help them learn.
- Events – important milestones and other notable events during the collaboration.
- Behaviour – what the participants did during learning.
- Interactions – the manner of the students' interactions with each other.
- Objects – artefacts and other physical things present in the environment.
- Tools – descriptions of the learning tools used by the groups, how they were used, and what they enabled the groups to achieve.

The complementary interviews were designed to pose more probing questions to uncover, for example, intentions, motives, perceptions, experiences, underlying thinking processes, thoughts, and feelings.

#### **6.4.5 Qualitative data analysis approach**

Social research has been studied and analysed through various traditional strategies, such as quantitative and qualitative research (Bryman & Bell, 2007; Robson, 2011). Quantitative research is

an approach to examining objective theories by analysing the relationship between variables and standards, using numbered data and statistical procedures (Rubin & Babbie, 2005). Thus, the data collection process is either in the form of or expressed as numbers (Easterby-Smith et al., 2008). However, qualitative research is one of the major methodologies in the social sciences (Bryman & Bell, 2007). It attempts to examine topics such as “the attitudes, behaviour and experiences of specific social groups or individual people” by exploring social and political issues or a range of ethical dilemmas related to social work practice (Malcolm, 2013: 42). Qualitative research applies intensive interviews and observations with small groups of individuals, and then correlates or compares the findings with prevailing theories (Carey, 2013).

Therefore, this study utilises a qualitative research strategy to gain the actual meanings (Bryman & Bell, 2007) of CL among preparatory year students and their teachers at Hail University, which required an in-depth exploration in the Saudi context. Moreover, the research questions required the researcher to develop a strategy that explored CL and its impacts on teachers’ teaching and students’ learning processes. In addition, the main consequence of this research is the production of a theory to improve the understanding of CL in Saudi HE. This is one of the core values of qualitative research, as it concentrates on the process rather than on the outcome (Punch, 2005). Simply put, the production process of theory is important to ensure the rationality and trustworthiness of the results. As Daly (2003: 193) maintains, meaning and context are crucial components in qualitative research in the sense that “qualitative research seeks meaning [...] and contributes to theory development by proceeding inductively. [...] Rather the phenomenon is studied in its context with the view that it is impossible to understand it apart from it”.

## **6.5 Research Approach and Methods Adopted**

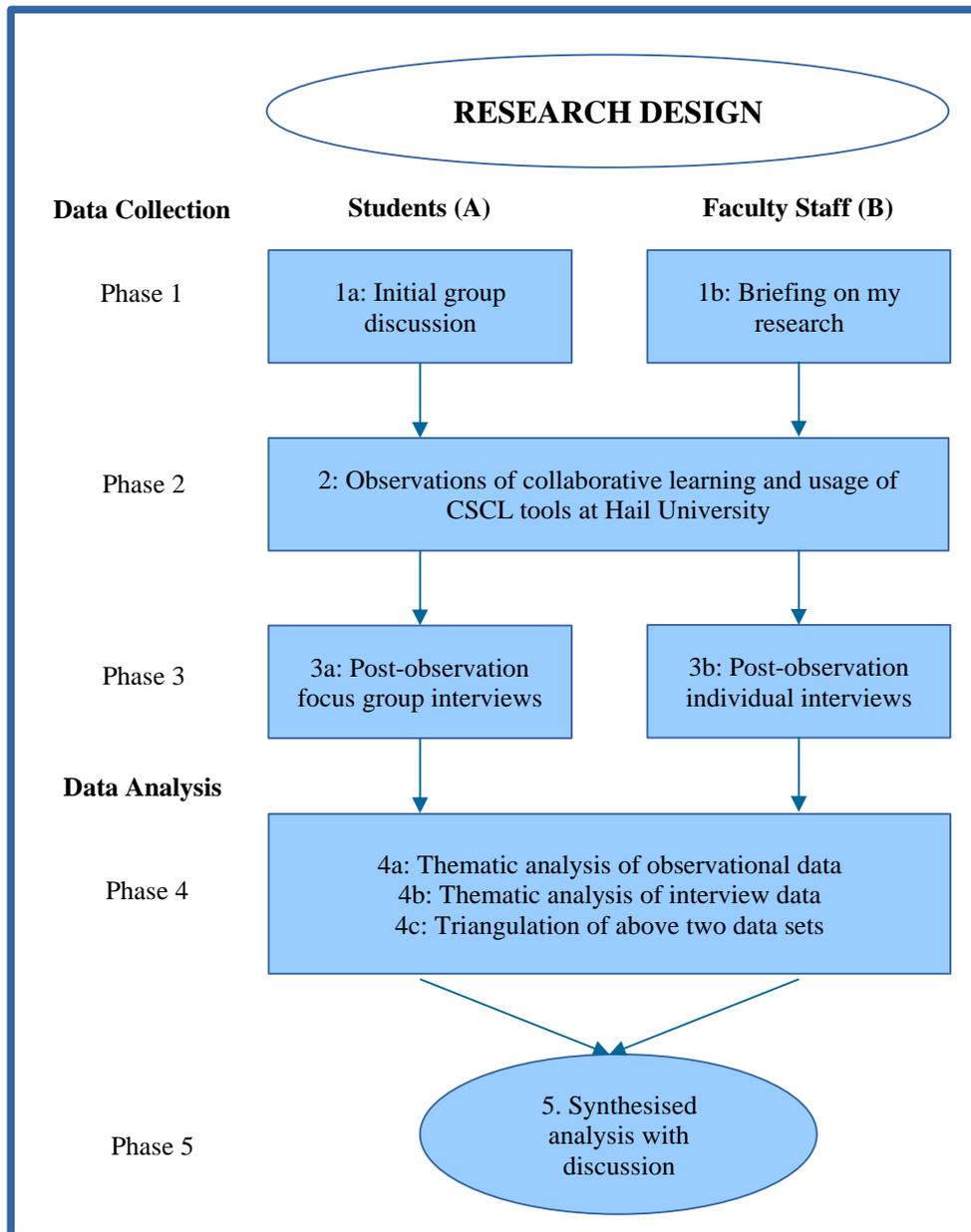
The primary research was designed to further the above-stated objectives after considering the critical analysis of the existing literature in the previous chapter. This included an initial discussion session with the student participants to introduce the research, ensure ethical guidelines were followed, and obtain basic demographic information about the classes to be observed so that the four focus groups could be formed fairly by minimising possible confounding variables, such as student ability and previous experience with CSCL. It was necessary to create focus groups because of the large number of students and to avoid interviewing them all individually. During this type of interview, the participants interact more, making group dynamics important for stimulating discussions (Cohen et al., 2018: 532). This approach then incorporated observations followed by focus groups and

interviews in a sequence that makes it exploratory research. The details and justification for this approach and sequencing are given in the next subsection.

As research questions vary, different techniques are required to answer them. They can be answered by using either empirical methods or through existing academic studies in the research area. According to Collis and Hussey (2014), there are two main research approaches: inductive and deductive. The former is appropriate for interpretivist or phenomenological research based on collecting information followed by developing theories. In contrast, the opposite direction is taken in the deductive approach used for positivistic research, in which the theoretical background of the research is considered first followed by generating hypotheses by gathering data to test them (Bryman & Bell, 2003). The present study seeks to investigate lecturers' perceptions of the utilisation of social media in teaching and learning processes at a selected higher education institution in Saudi Arabia. It takes an inductive approach to analysing qualitative data. The adopted research approach and design are detailed in the subsequent section.

### **6.5.1 Structure and sequence**

This section details the structure and sequence adopted for conducting the primary research in the literature review. The three data collection phases (initial group discussion, observations, and interviews) were followed by two data analysis phases, explained later in section 6.10. Finally, all stages were arranged to conduct exploratory research to explore ideas and insights. This structure was devised as shown in Figure 3 below.



**Figure 3: Outline of the research design**

Table 11 below summarises the key descriptions of the data collection phases, detailed further below. It describes the three adopted methods of observations, focus groups and interviews. The final row shows the research questions considered when selecting the methods.

**Table 11: Key descriptions of the three data collection phases**

Method >	Initial Discussion	Observations	Focus Groups	Interviews
Phase	1a	2	3a	3b
Paradigm	Interpretivist	Interpretivist	Interpretivist	Interpretivist
Process	Inductive	Inductive	Inductive	Inductive
Data (in the case of this study)	Designed to be mostly subjective	Designed to be mostly subjective	Designed to be mostly subjective	Designed to be mostly subjective
Participants	Whole class(es)	Whole class(es) selected to be observed	Selected students at the university	Selected faculty staff at the university
Questions	Closed-ended	n/a	Open-ended	Open-ended
Format	Structured/Planned	Non-participant	Semi-structured	Semi-structured
Target sample size (minimum)	Whole classes	2 classes	2 focus groups	10 individuals
Sampling	Purposive	(Whole class)	Purposive	Purposive
Obtained sample	1 class of 30 students	4 classes of 20-25 students in each	6 groups (total 30 students, 5 in each)	12 individuals
Data analysis	Thematic analysis	Thematic analysis	Thematic analysis	Thematic analysis
RQm/RQs addressed	RQs1, RQs2	RQs1, RQs2, RQs4	RQs1, RQs2, RQs3, RQs4	RQs1, RQs2, RQs3, RQs4

### 6.5.2 Achievement of objectives

Each objective was mainly addressed concerning the study's objectives, as indicated in Table 12 below. The first objective was expected to be achieved by carrying out observations (2) and interviews (2) with faculty staff, and the focus group sessions with students (1b); the second also by the focus group sessions with students (1b); and the third and fourth are mostly discussed after completing the analyses in the discussion chapter.

**Table 12: Mapping of objectives and research design phases**

Objective		Research Phase
1	Factors that assist and facilitate CL among students	1a, 2, 3a-b
2	Factors that may obstruct or hinder CL among students	1a, 2, 3a-b
3	Perceptions towards CL, its deployment and practices, and use of its tools	1b, 3a-b, 4
4	Experiences of CL and use of CL tools	2, 3a-b
M	Perceptions, experiences, and usage	5

### 6.5.3 Arrangement of the observations

The researcher observed four classes, two of which worked collaboratively using computers and two without using a computer. For both CSCL and TCL/non-CSCL (or traditional) settings, one group was selected from a department teaching a technical subject (medicine), and the other a non-technical subject (Learning, Thinking and Research Skills). The research design was applied to observe how the course was delivered and the collaboration that occurred. These observations were recorded as field notes and were produced non-participatively, without interacting or participating with the teacher and students (see 6.10 Data Analysis and Table 13 below).

The observations were planned to be conducted systematically by noting relevant details of the setting, routines, the student participants, their behaviours or mannerisms while collaborating, and notable events and milestones that led to reaching a consensus. In line with Morrison's (1993) identification of different settings, the observations were made in the following areas:

- Physical setting – The physical environment within the class and university.
- Human setting – Organisation of students, characteristics, and make-up of the class and students such as gender and grade.
- Interactional setting – Interactions that took place, whether formal, informal, planned, unplanned, verbal, or non-verbal.
- Programme setting – Organisational resources, curricula, and pedagogic styles.

Quantifiable aspects, such as how many discussion points were started or how long each student spent collaborating, were not noted during the observations, as this was not a quantitative study. However, the qualitative data gathered were according to the checklist presented in Appendix A, and some qualitative comparisons were made with data from non-CSCL classes. In addition, based on information gained from the literature review (see section 3.5.1), the following observable behaviours were also noted during the collaboration:

- Rimor et al. (2010): Initiative (a question is posed), externalisation (an original contribution is made), and rapid consensus (an opinion is accepted).
- Dillenbourg (1999/2009): Collaborative learning is “a situation in which particular forms of interaction among people are expected to occur, which would trigger learning mechanisms”.
- Siddiqui (2009): CL is distinguished from other similar forms of learning, such as cooperative learning, by (1) intentional design – learners are given purposeful learning activities; (2) co-labouring – participants engage together actively towards achieving their objectives; and (3) meaningful learning takes place – the knowledge deepens learners’ understanding.

**Table 13: Observation checklist**

Fixed Observations (pre-session)	Non-Fixed/Dynamic Observations (while collaborating)
<p><b>Physical setting</b> – descriptions of each of the two settings (technical class and non-technical class)</p> <ul style="list-style-type: none"> <li>● Physical/Visible features of the classroom environment</li> <li>● Whether natural or arranged/laboratory</li> <li>● How the students normally use the setting.</li> </ul> <p><b>Participants</b> – descriptions of the two groups of participants</p> <ul style="list-style-type: none"> <li>● Physical characteristics of the students, such as age, gender (all male), ethnicity and clothing</li> <li>● Other relevant features, such as education, personality, attitude, temperament, and familiarity</li> </ul> <p><b>Programme</b> – details of the tasks given to each group of participants.</p> <ul style="list-style-type: none"> <li>● Given task – What the students have been tasked to do</li> <li>● Goals – What the participants are trying to achieve</li> </ul> <p><b>Objects</b> – artefacts and other physical elements present in the environment.</p> <ul style="list-style-type: none"> <li>● The presence of those objects that impact the behaviour of the collaborating students</li> <li>● The placement and arrangement of those objects</li> <li>● Cultural artefacts used by the students that might affect their ideas, values, and attitudes</li> </ul> <p><b>Tools</b> – descriptions of the learning tools used by the groups and how they are used.</p> <ul style="list-style-type: none"> <li>● The tools to be used by the students</li> <li>● The way the tools are designed to be used</li> </ul>	<p><b>Activities</b> – notable collaborative activities the students engage in to help them learn</p> <ul style="list-style-type: none"> <li>● The set of acts taking place during the observations</li> <li>● Sequence of activities</li> </ul> <p><b>Events</b> – important milestones and other notable events during the collaboration</p> <ul style="list-style-type: none"> <li>● Notable happenings and incidents during the collaboration</li> <li>● Important milestones achieved by the students.</li> </ul> <p><b>Behaviour</b> – what the participants do during the learning</p> <ul style="list-style-type: none"> <li>● How the students felt and expressed themselves</li> <li>● Any notable unexpected behaviours</li> </ul> <p><b>Interactions</b> – the manner of the students’ interactions with each other</p> <ul style="list-style-type: none"> <li>● How the students interact with each other</li> <li>● What the students do in learning collaboratively</li> </ul>

### 6.5.4 Format of the interviews

Semi-structured qualitative interviews involve having a given agenda and asking open-ended questions. These are used to gather data on intangible aspects of culture, such as beliefs, values, and assumptions (Cohen et al., 2018). The agenda in this current study was to investigate facilitating and hindering factors and to explore perceptions and experiences concerning collaborative learning

generally and the use of CSCL tools in particular. Open-ended questions were formed for the interviews. As mentioned before, the focus was on intangible aspects that could not be observed during the observations (see Appendix B). More details are provided under the observational behaviours that were looked for under ‘indicators’ in subsection 6.7.2. The interviews were arranged to:

- Understand, evaluate and assess the participants, the collaborative learning situation and the collaborative learning itself.
- Explore students’ opinions on collaborative learning.
- Explore students’ experiences of collaborative learning.
- Examine students’ and teachers’ perceptions of computer-supported collaborative learning and their use of CSCL tools at the selected university.

## **6.6 Collaborative Learning**

### **6.6.1 Collaborative learning tool**

The review of the literature helped identify important characteristics of CL in general that apply to both CSCL and non-CSCL, especially the building of a community (Armstrong, 2011), interaction (Rimor et al., 2010), and knowledge sharing (Tesavrita et al., 2017). These characteristics of community building, interaction, and knowledge sharing were looked for to ensure the group undergoing collaborative learning adequately created a CL environment. The research was conducted in a collectivist cultural environment. The literature has shown this to be characterised by competitiveness but in which power distance is typically high (Zhu, 2011), and there is little interaction between students. Biasutti (2017) suggested wikis are particularly useful for sharing and discussing ideas to address the lack of equality and interaction. The researcher did not prescribe any tools in the present study. The students used what was provided to them by the university, and it so happened that the CSCL classes used a forum during this research. As such, this study follows the example of the studies by Hewage and Perera (2013), Yusop and Abdul Basar (2016), and Caballe et al. (2011), in which a forum was used. Some classes used CL tools in working collaboratively, whereas others did so without using any CL tool. Besides observations and interviews, the researcher also noted differences between the two different learning arrangements. In addition to discussion forums, the literature review revealed other researchers also investigated collaborative learning among students in which wikis and social media were used.

### 6.6.2 Indicators of collaboration and enhancement

Based on the review of the literature, observable behaviours noted in section 6.6.3 above were deemed as showing evidence of collaborative learning, which were looked for in this study as signs that collaborative learning was taking place and of its enhancement. The indicators of enhancement that were examined during interviews to judge whether there was enhancement in the way students collaborated and their learning outcomes are summarised in Table 14 below. This information could help determine whether there was any enhancement in a CSCL group compared to the group undergoing CL without using a CSCL tool. However, this was not a central objective of this study. This analysis could help to highlight notable differences between the two sets of learning arrangements (CSCL and non-CSCL).

**Table 14: Possible indicators of enhanced learning**

Collaboration	Learning Outcomes
<ul style="list-style-type: none"> <li>- Extent of active involvement in collaboration</li> <li>- Behaviours indicative of collaboration</li> <li>- Extent of meaningful interactions</li> </ul>	<ul style="list-style-type: none"> <li>- Awareness of learning objectives</li> <li>- Understanding of the content</li> <li>- Quality of learning information gathered</li> </ul>

As further indications of collaboration (for sub-research questions RQs1-3 in particular), especially during the observation stage, some use was made of Muuro et al.'s (2014) categorisation (see Table 15), except for those characteristics that required gathering quantitative data. The three collaboration characteristics they identified are detailed in Table 15 below, concerning how they may be indicated and measured. This table was formed from the descriptions of these characteristics in Muuro et al.'s (2014) study. Furthermore, only qualitative data were gathered in the present study, so their measurements regarding collaboration characteristic were not undertaken in the present study.

**Table 15: Collaboration characteristics and their indication and measurement**

<b>Collaboration Characteristic</b>	<b>Requirement /Indication</b>	<b>Measurement</b>
Interdependence	Active participation by each member	Counting the number of statements and messages submitted by each group to other participants
Independence	Posting new ideas instead of merely replying (in the case of CSCL)	Extent of influence by the instructor or other participants in an individual's interactions
Synthesis	Interaction pattern of discussion	- Making of statements by participants, which are then extended to yield new ideas by other participants - Analysing the relationship between the original comments and the final product

This study examined the outcomes of collaboration in the form of qualitative data and in light of the original comments made by the participants. This method appeared to have the advantage of being simpler to conduct than attempting to measure the extent of the synthesis by analysing the pattern of interaction of the whole discussion.

## **6.7 Ethical Considerations and Positionality**

### **6.7.1 Ethical considerations**

It is important to consider ethical considerations concerning the rights of research participants and others that may be affected. Ethical guidelines ensure that no participants in the research are harmed in any way and that the data gathered are authentic and trustworthy. Ethical approval to conduct the study was obtained from the researcher's Faculty Ethics Committee. Once approval was gained, a risk assessment was carried out to identify potential issues. This was necessary as the research involved working with two groups of people: lecturers as university faculty staff and university students from the selected university in Saudi Arabia. Other than this risk assessment, general ethical guidelines were followed, as laid out by the researcher's own university and the UK Data Protection Act 1998, especially considering the General Data Protection Regulation (GDPR). The collected data were used exclusively for research purposes following the methodology detailed in this chapter. The data were kept in a password-protected directory to which only the researcher had access.

In addition, general ethical principles for conducting research were followed based on the British Educational Research Association (BERA) guidelines. For example, all participants must be provided with all necessary information about the nature and purpose of the research so that any concerns may be alleviated before commencing. It is also important to collect data as accurately as possible

(Saunders et al., 2012) and to assure participants of the confidentiality of their responses and, if they so wish, the anonymity of their identity. Therefore, some general guidelines for conducting research interviews were adopted after gaining each participant's consent. The researcher explained the purpose and format of the interview, indicated how long the interview might take, chose a setting with little distraction, addressed any confidentiality concerns, asked for permission to record the interview, asked the participants if they had any questions, and told them how to get in touch later if they wanted to. In addition, in recognising the potential for certain problems to arise during the interview, the researcher ensured the following (Cohen et al., 2018: 520):

- Avoiding distractions and interruptions.
- Avoiding asking awkward questions, sensitive matters, and being superficial.
- Avoiding giving signs of approval.
- Not summarising too early and not closing off the interview too soon.
- Giving the interviewees time to answer and being prepared to repeat questions at their request.
- Interviewees were also informed of their rights to withdraw at any time.

### **6.7.2 Positionality**

The researcher's positionality is another important consideration in academic research. It clarifies the adopted position of the researcher concerning the participants and context, and anticipates the possible influence of this position on the research process. Such insight comes through reflection (Holmes, 2020). The cultural context of the research was Saudi Arabia, of which the researcher is a native and, therefore, an Arabic speaker, well acquainted with Saudi culture, local customs, and religion, and, importantly, able to conduct interviews in Arabic. All the research participants were male teachers with whom the researcher had worked personally. Therefore, no race or gender issues arose in this research, such as difficulties accessing the institution and arranging to interview female staff. However, working with staff as a colleague meant I shared a similar background, which made me both an insider and an outsider. I was an insider in being acquainted with some of the staff and the university (but not current students), and an outsider by relating with some of the staff involved in this research as an independent researcher. The same was not an issue with the students because preparatory year students are new to the university, and they were neither taught by the researcher nor acquainted with him.

The challenge as an insider was to avoid participating in the research and introducing bias and remaining detached as an independent observer (Pannocci & Wilkins, 2010). The observations were

not participant observations either, but direct field observations. As such, neutrality, impartiality, and remaining non-judgemental were of critical importance, and these were ensured by observing passively and not being seen to be on anybody's 'side' (Cohen et al., 2018). When conducting the research, the aim was also to be as objective as possible, but, as pointed out by Bourke (2014: 3), "to achieve pure objectivism is a naive quest, and we can never truly divorce ourselves of subjectivity". For example, I am an advocate for CSCL among students. Still, my own thoughts, observations, and interpretations were not allowed to influence the participants, so that an accurate reflection of the views and experiences of the participants themselves could be ascertained. This was achieved by remaining neutral, impartial, and objective as far as possible during gathering the primary data by, for example, not suggesting in any way that CSCL tools should be used or that they are beneficial.

### **6.7.3 Data quality considerations**

In qualitative studies, qualitative researchers do not use instruments with established metrics in respect of validity and reliability. It is important to address how qualitative researchers establish that their research study findings are credible, transferable, confirmable, and dependable. Trustworthiness is concerned with establishing the four aspects described in more detail below. Thus, when designing a research instrument, it is vital to take data quality into consideration, especially in terms of credibility, dependability, transferability, and confirmability (Lincoln & Guba, 1985, qtd in Cohen et al., 2018: 249).

The first three (credibility, dependability, and transferability) are analogous to internal validity, reliability, and external validity, respectively, which are terms typically mentioned in quantitative research. Of these, credibility is ensured by persistent observation, peer debriefing, member checking, and triangulation, and dependability by providing respondent validation, reflexive journals, and independent audits.

One potential threat to credibility that may have been relevant to this study changed with events. Since this study examined the collaborative potential of CSCL tools that are continuously evolving, it was essential to use the latest versions as far as possible. Secondly, it was important to be aware of the latest developments that may affect their collaborative potential in the near future. Furthermore, the adoption of multiple qualitative methods in this study could also help to ensure credibility. One of the advantages of this approach is that it improves the credibility of the research findings. It increases the strengths and weaknesses of single methods, enables complex issues to be analysed, and allows for triangulation. In addition, the content validity of the interview questions was ensured, which means that they were checked for sufficient coverage of the topic so that they could be

considered representative. This type of validity describes “the representativeness of the content of a measuring instrument” (Krishnaswamy et al., 2009: 265). The small pilot study mentioned earlier was thus also conducted to help refine the items in these instruments.

A threat to transferability may have occurred in selecting participants, especially for the small interview sample of faculty staff that was derived from the survey sample of faculty staff. Therefore, the procedure for choosing interview participants was made carefully to increase the chances for high-quality insight. As a result, all the samples were adequate, although the findings are not generalisable and cannot, therefore, be taken as representative of the kingdom as a whole.

## **6.8 Pilot Study**

### **6.8.1 Pilot study arrangement and purpose**

A pilot study was arranged before carrying out the main study because some important decisions relating to the research design are often made before gathering the data (Drew et al., 2008), such as clarifying the issues to be researched and planning for the data collection to ensure high-quality data are obtained. In this case, the pilot study was arranged to refine the instruments used in conducting the main study, explore its context, and introduce the study. This was carried out for four weeks in June 2019. In particular, the preliminary inquiry focused on gathering views on what characterises collaborative learning and how CL was currently being promoted at the educational institution under study. In addition, the pilot study was arranged to assess the trustworthiness of the focus group and interview questions before finalising them. Cypress (2017: 254) defined trustworthiness in qualitative research as follows: “trustworthiness refers to quality, authenticity, and truthfulness of findings of qualitative research. It relates to the degree of trust, or confidence, readers have in results”. Trustworthiness is a crucial aspect of qualitative research and refers to the credibility, transferability, dependability, and confirmability of the research findings (Lincoln & Guba, 1985). Ensuring trustworthiness is important because it enhances the quality and rigour of the research and helps to establish the credibility of the findings. Thus, trustworthiness is a critical aspect of qualitative research that requires researchers to use a range of strategies to enhance the credibility, transferability, dependability, and confirmability of their findings.

**Credibility:** This refers to the degree to which the findings of a qualitative study are believable and accurate. To enhance credibility, researchers can use techniques such as triangulation, member checking, and prolonged engagement. Triangulation involves using multiple sources of data to confirm the findings; member checking consists of sharing the findings with participants to confirm

their accuracy; and prolonged engagement is concerned with spending a significant amount of time in the field to develop a deep understanding of the research topic.

**Transferability:** This refers to the degree to which the findings of a qualitative study can be transferred to other contexts or settings. To enhance transferability, researchers can provide a detailed description of the research context, sample selection criteria, and data collection methods.

**Dependability:** This refers to the consistency and stability of the research findings over time. To enhance dependability, researchers can use techniques such as peer debriefing, audit trails, and reflexivity. Peer debriefing involves seeking feedback from other researchers to confirm the findings; audit trails require documenting the research process in detail to enable others to replicate it; and reflexivity means reflecting on the researcher's own biases and assumptions and how they may have influenced the research findings.

**Confirmability:** This refers to the degree to which the research findings are objective and unbiased. To enhance confirmability, researchers can use techniques such as triangulation, member checking, and reflexivity. Triangulation involves using multiple sources of data to confirm the findings; member checking consists of sharing the findings with participants to confirm their accuracy; and reflexivity is a reflection on the researcher's own biases and assumptions and how they may have influenced the research findings.

Overall, the notion of trustworthiness is critical to the validity and reliability of qualitative research. Researchers need to use appropriate strategies to enhance the trustworthiness of their research findings and ensure that they are credible, transferable, dependable, and confirmable. Trustworthiness was achieved by checking whether the questions could provide the data required in this study. For example, the pilot study was used to minimise errors caused by poor sampling, inadequate wording and design, and the possibility of incorrect, biased, low, and non-responses (Cohen et al., 2018).

Moreover, the interrogations developed were first written in English and then translated into Arabic to make the participants feel relaxed while answering. Maxwell (1996) recognised four kinds of translation, one of which is back translation. This incorporates the translation of the target language, a grammar check, back-translation into the source language and a grammar check, then a pre-test to ensure proficiency. Afterwards, the questions were then converted into Arabic, checked for grammar, and then translated into English and tested to guarantee proficiency before presenting them to respondents in Arabic. The sample participants responded to the questions in Arabic, their answers were then translated into English, and then translated back into Arabic. The translated versions were

sent to the participants to double-check if the copy they received seemed correct. In addition, two samples of interview transcripts were double-checked by the researcher with another translator to confirm accuracy. Finally, the translations were checked for grammar to certify they were correct, and the replies were examined accordingly.

### **6.8.2 Pre-sampling**

The selection of interview participants for the main study was purposive. The rationale for this pre-sampling during the pilot phase was to ensure greater control over the sample to obtain participants most able to provide the required data and ensure that they served to help address the specific research questions. This involved deciding on the following four aspects: (1) the setting in which the research was to take place; (2) who was to be interviewed; (3) what the participants were to be interviewed about or did; and (4) the process (Miles & Huberman, 1994). In this case, the setting for the interviews had been previously decided to be a particular university (Hail University) based on convenience and familiarity. The other aspects were determined by the need to address the research questions and the outcome of the pilot study. For example, RQs1-2 (Factors that facilitate or hinder collaboration) could best be addressed by someone involved in arranging for collaborative learning. It so happened that the selected participants were those with demonstrated knowledge and experience of collaborative learning, so they were interviewed about this phenomenon and the process evolved, leading to identifiable outcomes, such as what the students gained from their experience of learning collaboratively.

## **6.9 Data Collection**

### **6.9.1 Sampling procedures and initial discussion**

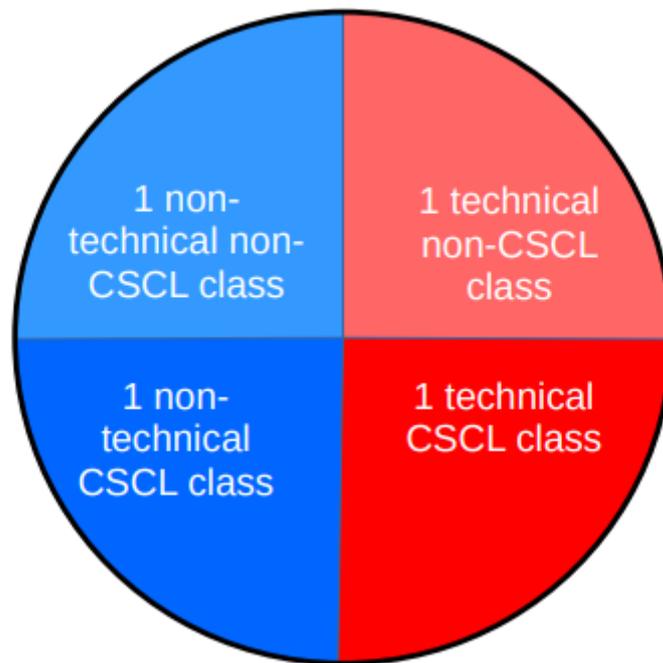
A purposive (non-probability) sampling strategy was applied for obtaining willing participants and arranging for the observation, focus group, and interview samples. This strategy enabled obtaining samples “based on their judgement of their typicality or possession of the particular characteristic(s) being sought” (Cohen et al., 2018: 218), which, in the case of this study, is the utilisation of collaborative learning. Selectivity was thus necessary from the population of preparatory-year students at the university to target only those classes that have adopted collaborative learning, both in traditional form and CSCL. Classes that do not learn collaboratively were not considered because they would not have provided data on collaborative learning. These exclusion criteria were not restrictive because the practice was common at the university. The samples were, therefore, obtained easily.

All the interviews were conducted at Hail University among preparatory-year students and teachers. The sample comprised many university faculty members in the KSA who arranged for their preparatory-year students to learn collaboratively. Four classes were selected to enable comparisons to be drawn, as follows: two classes using CSCL while being observed, one studying a technical subject from the Department of Medicine (Medical Science) and the other a non-technical subject from the Department of Humanities (Learning, Thinking and Research Skills); and likewise two classes in which collaboration took place without using a computer during the observations, one each from the same departments.

The initial group discussion was held for the convenience of all the student participants to make them feel comfortable and informed about the research. After completing the literature review, this was carried out to gain a clearer idea of an appropriate and suitable introduction and discussion. The initial target was to make two class observations, conduct two focus group sessions with students, and conduct 10 individual interviews with teachers; however, four classes were observed, and six focus groups and 12 teacher interviews were held (see Table 16). The initial group discussion in phase 1 was also arranged to ensure the representativeness of the student participants in the focus groups to minimise potential bias, such as differences in ability and experience. Their teachers made this division because they knew their own students well. This took place before the observations and the interviews of the whole class, and the information from this helped form the two groups, which assisted in balancing the factors mentioned above as far as possible.

**Table 16: Target and obtained samples**

Sample	Initial Discussion	Observations	Focus Groups	Interviews
Phase	1a	2	3a	3b
Target → Obtained	1 → 1	2 → 4	2 → 6	10 → 12
Participants	A total of 30 students from the 4 classes	Classes (whole, 20-25 students in each)	From the 4 observed classes (5 students in each focus group)	Lecturers (individually)



**Figure 4: Subsamples of the sample of four observed classes**

Table 16 and Figure 4 above show the four sample sets mentioned above and the subsets, as well as the three data collection phases: the observations of whole classes of students, the subsequent phase involving interviews with their teachers individually, and the focus group interviews, which makes six focus group interviews in total (comprising CSCL and non-CSCL groups). Since some of the samples are subsamples or super-samples of others, a relationship chart can be drawn to clarify this relationship. This is shown in Figure 4 above. It was expected that each class would have around 30 students, but they had between 20 and 25 in each. One of the two CSCL classes was a summer school class. Concerning the students, the superset is the sample of four observed classes comprising approximately 20-25 students in each, from which six smaller focus group interviews were arranged with 30 students (five in each group). Two of the observed classes used CSCL tools while learning collaboratively.

In contrast, two did not do so, and one in each pair was interviewed in smaller focus groups, as represented by each quadrant in the above figure. Of the four observed classes numbered 1-4, the first and third used CSCL tools, and the second and fourth did not. Also, the first two (1 and 2) comprised students from the technical medicine department, whereas the last two (3 and 4) comprised students from the non-technical humanities department. [The following are descriptions of each phase in more detail:](#)

1. Phase 1 (Initial discussion and briefing): The initial group discussion with students and briefing of faculty staff were arranged to introduce the research to the participants, and, in the

case of the group discussion, to obtain some background information on preparatory-year students and to make them feel comfortable in participating and familiar with the topic of the research. The briefing was on the nature of the research and the interviews arranged for them.

2. Phase 2 (Observational data collection): Observations of four classes of students while they collaborated, comprising two that used a CSCL tool and two that did not use any CSCL tool, and based on whether they are of technical or non-technical subjects. These observations were of the students' present experiences with collaborative learning at the university using (in the case of CSCL tools) the university-provided computers.
3. Phase 3 (Focus group and interview data): Purposive focus group interview sessions were held with several classes and interviews with the class teachers or lecturers. Most of the data in this study were collected during this phase.

### **6.9.2 The selected institution: Hail University**

The case study was conducted at Hail University, situated in Saudi Arabia and founded in 2005. Some of the stated goals of the university are to: “Enhance interaction and collaboration between the university and community”, “Develop information technology systems and practices at the university”, and “Develop self-resources to achieve independence and autonomy” (UOH, 2021). Furthermore, its mission is to “apply the highest quality standards and utilize the university’s human and technical resources to reach the society of knowledge”, and its vision includes knowledge dissemination and research excellence.

The students and their teachers for the cases were selected from the preparatory year in two departments: Medicine and the Humanities. Foundation-year students at Hail University learn collaboratively, both with and without computers. All students throughout the university are also provided access to the university’s Blackboard LMS. The students are mostly Saudi and a small proportion of international students from other countries.

### **6.9.3 Observational data collection**

Observational data were collected from four classes, two of which used CSCL and two collaborating without using computers. In these non-CSCL classes, the students were grouped by the teacher and given activities and handouts in which the student had to collaborate to complete the activities. Each class lasted for one hour. The following general procedure was applied for conducting the observations in the four classes:

1. During the first 10 minutes, the teacher explained to the students the aim of the lecture and what they were expected to learn in terms of learning objectives. Then, in one of the non-CSCL classes, the teacher informed his students of this research and the reason for the researcher being there. Finally, in one of the CSCL classes, it became obvious that the researcher observed them with an eye on their collaborative behaviour.
2. For the next 10 minutes, the teacher focused on what the students would do using computers in the two CSCL classes and without computers in the two other classes and how they were expected to do it.
3. In the third stage, the class was divided into four groups. Each group worked together using an online forum in the CSCL classes, and they discussed all points and shared their responses later with the other groups using the interactive whiteboard.
4. Notes were made as arranged beforehand, both before and while the collaboration took place.

#### **6.9.4 Interview data collection**

The sample for the interviews, both focus group sessions with students and individual interviews with teachers, was arranged to obtain more in-depth insight into the role and potential of collaboration and was accepted as a smaller subsample of the participants observed while teaching or learning at the selected university. The interview sample was also obtained purposively to ensure high-quality data. The justification for purposive sampling for collecting interview data was the need to ensure that “excellent participants” are interviewed to increase the chances of obtaining “excellent data” (Bryant & Charmaz, 2010: 231). The excellence, in this case, was in terms of collaborative behaviour noted during the observations, not academic achievement or performance in exams. As per Bryant and Charmaz’s (2010) description, this meant those participants who were “reflective, willing, and able to speak articulately about the experience” (p.231) so that the data from their interview responses would be relevant and useful in this study.

The observations helped choose which students to include in the focus groups in selecting the interview participants. This selection of focus group participants was based on how active the students were during the observations regarding their collaborative behaviour, as suggested by their teachers. In addition, all the participants expressed their willingness to contribute further and be interviewed. The focus groups were arranged as subsets of two of the observed classes because the classes were too large to interview all the students simultaneously. Each focus group comprised a smaller group of 4 to 6 students, and each focus group was interviewed separately. All the faculty members for the individual interviews were from the preparatory year, as planned. The interviews were terminated when a ‘point of saturation’ had been reached. Another, thirteenth, interview was conducted, but the data were not considered rich enough to include. A smartphone was used to record the audio of the

interviews. No video recordings were made. Each interview lasted between one hour and ninety minutes. The interview phase focused on the following:

- Confirmation of permission to participate.
- Background of students in terms of ability and previous experience of CL and with using CSCL.
- The extent to which students tended to collaborate through using the CSCL tools in practice provided by their university.
- Whether the use of the CSCL tools collaboratively was productive concerning learning.
- Perceptions and experiences of the students and teachers at the selected university.
- Possible characteristics of the CSCL tools used concerning enhancing collaborative learning.

Some other areas that were investigated through the interviews included whether the provision of CSCL tools support student collaboration or not, in what ways, and how well they support it and, if they do, whether this is adequate or inadequate for enhancing student learning, the potential for further enhancement through collaboration, and so on. It is important to investigate a range of aspects at the outset because each can affect students' experiences and the effectiveness of the facilities provided for using CSCL (Masrom & Hussein, 2008).

## **6.10 Data Analysis**

The process of data analysis involves several stages of coding to extract insights and meanings from the collected data. The initial or open coding stage involves carefully reading the raw data and generating as many ideas and insights as possible by breaking down the transcripts into pieces of raw data and labelling them (Charmaz, 2006). In the focused or selective coding stage, the researcher groups these initial codes into themes and sub-themes based on their prevalence and importance in the analysis. Finally, in the theoretical or axial coding stage, the researcher polishes the final categories in the theory and specifies relationships between these themes along the lines of their sub-themes, properties, and dimensions.

It is worth noting that the researcher used a manual approach to analysing the data, as it allowed for a deeper understanding of the data and familiarity with the similarities and differences among the narratives of the interviewees. Although software programs such as NVivo can assist in organising and storing data, they do not analyse the data themselves, and high-quality analysis can be achieved through manual analysis alone.

Theoretical sensitivity is an important concept in the data analysis process, as it reflects the researcher's ability to use personal and professional experiences as well as methodological knowledge to present data in new ways and think about the data in the theory development process. The researcher was aware that the themes and sub-themes and their qualities must be generated by the questions and preconceptions.

Memos were written throughout the study period to stimulate and record the analyst's developing thinking. These notes were about events, cases, themes, or relationships between sub-themes and contained the interviewer's impressions of the participants' experiences and reactions. They were also used in systematically questioning some of the pre-existing ideas regarding what was said in the interview (Sbaraini et al., 2011). The researcher also made comparisons between data and codes to find similarities and differences and raised questions to be answered in ongoing interviews.

The data were collected from June 2019 to October 2019 exclusively from the selected higher education institution and on the university premises during the five months. Only the audio of the interviews was recorded using a mobile smartphone. The observation notes were made by hand and subsequently analysed by thematic analysis using a bottom-up approach to allow the themes to emerge from the data.

The inquiry conducted during the second and third phases was based on thematic analysis, which permits a lot of flexibility in interpreting the data and allows researchers to approach large data sets more easily by sorting them into broad themes. Both analyses made during these phases were then triangulated in phase 4 and synthesised in phase 5, keeping in view the research questions and any other new information that arose.

The study was conducted at Hail University, where the researcher teaches, for the convenience of familiarity and arranging the primary research. Initially, learning analytics manager software was considered for monitoring the collaboration, as utilised in Echeverria et al. (2016).

### **6.10.1 Thematic analysis**

Thematic analysis is the practice of identifying patterns or themes within qualitative data. Braun and Clarke (2006: 78) proposed that thematic analysis be the first qualitative method to be learned, on the basis that "it provides core skills that will be useful for conducting many other kinds of analysis". Hence, the data collected in this study were entirely qualitative, the few exceptions being data about specific descriptions of the participants, the classroom environment, and the university. These qualitative data were gathered mostly from observations, focus groups and interviews, and the initial

group discussion and was subjected to thematic analysis to identify commonalities in the responses and help summarise key points. Briefly, this was done in conjunction with Braun and Clarke's (2006) six-phase framework for doing thematic analysis: Step 1: Become familiar with the data; Step 2: Generate initial codes; Step 3: Search for themes; Step 4: Review themes; Step 5: Define themes; and finally, Step 6: Write-up. NVivo software was initially used to analyse the qualitative data to identify and refine the themes because it gave the researcher ways to gain a broad feel for what themes emerged from the data and enabled the researcher to drill down into the material for deeper analysis.

The procedure followed to analyse the data and to identify, refine, and catalogue themes to make sense of the data was followed in accordance with advice in Creswell and Creswell (2018), who state that the thematic analysis of qualitative (observational and interview) data involves "building patterns, categories, and themes from the bottom up by organizing the data into increasingly more abstract units of information" (p.299). Cataloguing involves representing useful data elements in segments that make them meaningful, using a catalogue for each component. This compartmentalisation is done based on classes, patterns, and other distinguishing features, such as the sequence or type of process involved. Eventually, this can lead to themes emerging, which are broad classes of information classified based on similarity or common ideas. This classification is designed to help make sense of the data, and, if possible, to draw comparisons and facilitate further analysis. The categories identified in the current study necessarily included methods, tools, features, and functions that support collaboration. The followings are the phases respected for thematic analysis.

Phase 4 (Thematic analyses): Thematic analysis of both data sets took place, followed by comparison and triangulation of the whole data.

Phase 5 (Synthesised analysis): Synthesised analysis was made of the entire data to address the research questions.

### **6.10.2 Triangulation**

Triangulation of the data is important because it adds to the trustworthiness of the findings. It involves the use of multiple sources of data or multiple methods of data collection to verify and validate the findings (Denzin, 1978). Other strategies include member checking, peer debriefing, and maintaining an audit trail. Member checking involves sharing the research findings with the participants to confirm that the interpretations are accurate and valid (Lincoln & Guba, 1985). Peer debriefing involves seeking feedback from other researchers or experts in the field to ensure that the interpretations and conclusions are reliable and valid (Lincoln & Guba, 1985). Maintaining an audit

trail requires keeping a detailed record of the research process, including the data collection, analysis, and interpretation, to ensure that the findings are traceable and replicable (Miles & Huberman, 1994). This supports the validity of the data, which inspires “confidence in the outcome of the study so that others will believe what is reported” (Creswell, 2012: 133). This ability of triangulation to improve validity has been substantiated by, for example, Bekhet and Zauszniewski (2012). Effective triangulation, however, requires a very focused, concise, and relevant research question reflecting the purpose of the research (Casey & Murphy, 2009), hence the precisely defined research questions in this current study. Moreover, triangulation is particularly suited to a case study, such as the present study on collaborative learning (Adelman et al., 1980). Finally, the phenomenon under study is complex, which is also true for investigating collaborative learning practices (Xu & Xu, 2004).

In the case of this study, triangulation of the data was made possible using the two sets of observational and interview data. By researching in the order it was done – observations first, followed by focus group interviews and faculty interviews – the researcher was able to validate the observational data by asking the students and teachers and students in turn about them. This research design also made it possible to validate what students said during the focus group sessions when talking to the teachers.

A notable difference between the two data sets is that observational data are more subject to interpretation by the researcher due to greater freedom and autonomy in choosing what to observe and filtering and analysing the information. Although interviews may also be conducted with some freedom in questioning, the interviewees’ influence and responses affect the interview course, unlike in observations. Interviews are also richer in giving insight into the thinking and feeling of the interviewees, whereas observations are richer in capturing the whole social setting, making the two approaches complementary.

## **6.11 Methodology Summary**

This study was designed to investigate the perceptions and experiences of students and teachers at Hail University in Saudi Arabia of collaborative learning and their usage of CSCL tools to support their learning and teaching. With this in view, four objectives were formed: (1) to identify and examine factors that assist and facilitate collaborative learning among preparatory year students; (2) and which may obstruct or hinder it; (3) to explore the perceptions of students and teachers; and (4) to investigate the experiences of students and teachers at Hail University of collaborative learning and their use of CSCL tools.

The case study was conducted using a qualitative research design under the interpretivist paradigm, emphasising gaining insight into the factors, hindrances, perceptions, and experiences in an exploratory way. The adopted research methods were, in order, an initial group discussion, non-participant observations of four classes, six focus group sessions with students, and 12 semi-structured interviews with individual teachers. The observations involved noting the physical, human and programme settings in addition to the collaborative interaction of the students and their use of CSCL tools. Collaborative learning indicators looked for included the extent of active involvement, notable collaborative behaviour, and the importance of meaningful interactions. Students in two of the observed classes worked collaboratively using a computer and two without using a computer, and one each was studying a technical and a non-technical subject. The interview questions focused on the collaboration experiences, collaborative tools, perceptions, and so on and were open-ended. The data were then analysed inductively through thematic analysis, using a bottom-up approach for coding. Ethical precautions were also taken during both the collection and analysis phases. The data collection and analysis took place during 2019. The next chapter presents the study's findings from all the data collected by applying the methodology detailed in this chapter.

## CHAPTER 7 - PRESENTATION AND INITIAL ANALYSIS OF FINDINGS

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### 7.1 Introduction

The findings chapter presents a thematic analysis of the qualitative data obtained from the observations of students engaging in collaborative learning, interviews with faculty members who are either academic doctors or professors in academia appointed as lecturers, and focus groups with students. The lecturers are also referred to as teachers or Dr X, and the focus groups are referred to as FGX, whereby X is a designation applied in presenting this research to retain students' anonymity. This chapter is organised to facilitate analysis and discussion in the subsequent chapter, so it does not follow the order in which the data were collected.

The method used for extracting these findings was detailed in the previous, methodology chapter. In total, and in order of data collection: one initial group discussion was held with students to introduce the study; four class observations were made, of which three were of lecturers who were later interviewed; six focus group sessions were held with students; and 12 lecturers were then interviewed. The four observed classes comprised two doing a technical subject and the other two a non-technical subject. The subject being studied by the two technical classes was medicine, and the two classes of non-technical students were undertaking a course on Learning, Thinking and Research Skills. One class in each pair collaborated using CSCL and the other by non-CSCL. Each class session lasted around 45 minutes to one hour.

The interview findings have been divided into the categories that combine similar themes for ease of comparison and analysis. They deal with definitions of collaborative learning; potential benefits according to teachers; potential benefits according to students; facilitation of CL; provision, support, and receptiveness; and barriers, obstacles, and hindrances. Further data were collected on previous experiences, present experiences under observation, and future outlook according to the participants. These categories reflect the original main themes identified while coding the data. The aforementioned present experiences were undergone while using the university's computers for CSCL, some of it while under observation during the primary research. The findings emerge from the keywords relating to the themes and sub-themes identified in the data. The original lists of keywords describing them are available in Appendix D. The mind maps of these keywords are presented in the analysis chapter, some of which are reorganised as they emerged from the thematic analysis of the main qualitative data gathered in this study.

As indicated in Table 12 in Chapter 6, the information from the overall findings could help to directly address this study's first and last sub-objectives, which are to ascertain how collaborative learning is deployed and practised in the preparatory year (ObjS1) and to identify and examine factors that may assist or hinder collaborative learning (ObjS4). With further analysis, they could provide useful information for the other two objectives as well, which are to explore the perceptions of students and teachers at the selected university of collaborative learning with and without the use of CSCL tools (ObjS2) and to investigate their experiences of collaborative learning (ObjS3) (see sections 1.4 and 6.2). To reiterate, the focus of this study is on collaborative learning, and the overall or main objective of this study (ObjM) is: To investigate how collaborative learning is deployed, perceived, and experienced by a sample of students and their teachers in support of their learning and teaching in the preparatory year at Hail University. The findings presented below are based on all the data, most of which were obtained from the interviews (individual interviews with teachers and focus groups with students). Furthermore, the findings based on the CL experiences of the teachers and students were divided into past and present experiences. These findings were obtained from the observations of classes, focus groups with students, and interviews with teachers. The past experiences were related mostly to TCL, and some students reported they had worked collaboratively since elementary school and in high school science lessons. Most of the students' responses emphasised the opportunities of CL in terms of what it enables. In contrast, teachers also talked about the opportunities they experienced. Some restrictions they faced when using CL under test conditions and using it as a national requirement in the past. Other data collected on past experiences described the overall experiences of the students and teachers. The main themes and sub-themes that emerged from the data on past experiences of CL among the participants are presented in the mind map in Figure 6 in Appendix F.

For ease of understanding, the themes and their sub-themes are all compiled in Table 20. The themes were all based on the questions and content, or issues found while conducting the research. Table 20 shows the main themes and sub-themes that were originally identified from the data. Examples are given of quotations or rephrased excerpts for each of them that led to their identification as such. Nevertheless, each theme will be adjoined by its specific table for an informal comprehension.

## **7.2 Analysis of the Qualitative Data**

The data were analysed for word frequency, word count, complexity, and overall sentiment, and to identify themes using online tools.

### 7.2.1 Word frequency analysis (top 10)

Word frequency analysis was conducted and identified the top 10 words used by each participant in the data set they provided. Words such as learning, collaborative, and student(s) were the most common, confirming that the responses were focused on the topic of students' collaborative learning. This information is presented in Table 17.

**Table 17: Word frequency analysis of the data**

Dr J	Dr S [1]	Dr A	Dr S [2]	Dr K	Dr O
learning	learning	learning	learning	learning	learning
answer	you	collaborative	collaborative	students	collaborative
you	collaborative	students	you	you	you
collaborative	students	you	students	collaborative	osama
students	use	information	question	answer	should
think	yes	student	may	process	them
what	view	lesson	what	through	students
student	student	what	faculty	view	tools
tools	lecture	question	wiki	student	what
educational	what	get	computer	computer	make

### 7.2.2 Word count, readability, and complexity analysis

Word count, readability, and complexity analyses were also conducted, identified the length of each data set, and indicated the readability and complexity of their wordings. Dr O's responses were the lengthiest and most detailed overall, whereas Dr S's [1] were the shortest and briefest. Dr J's data set was the next shortest, but also the least readable, whereas Dr S's [2] was the most complex due to having the highest lexical density. This information is presented in Table 18.

**Table 18: Word count, readability, and complexity analysis of the data**

Name:	Dr J	Dr S [1]	Dr A	Dr S [2]	Dr K	Dr O
Word count	1192	932	1341	1309	1403	2155
Readability (6-easy, 20-hard)	9.6	7.7	7	9	9.6	7
Complexity (lexical density in %)	39.5	40.8	35.2	33.1	0.35	34.4

### 7.2.3 Sentiment analysis

Sentiment analysis was conducted and revealed that the overall tone of the four participants was relatively neutral, whereas Dr S [2] focused more on negative aspects and Dr K on positive aspects, reflecting greater enthusiasm for collaborative learning. This information is presented in Table 19.

**Table 19: Sentiment analysis of the data**

<b>Name:</b>	<b>Dr J</b>	<b>Dr S [1]</b>	<b>Dr A</b>	<b>Dr S [2]</b>	<b>Dr K</b>	<b>Dr O</b>
Score	9.4	-23.2	-6.9	9.3	12	-8.4
Meaning	neutral	negative/ serious	neutral	neutral	positive/ enthusiastic	neutral

### 7.2.4 Thematic analysis

The main analysis in this research was the thematic analysis. The following is an example of how a definition was coded from Dr A's data set:

{definition} collaborative learning differs according to the studied subject; I mean that it succeeds in some subjects and not in others. The teacher can perform the lecture and collaborative learning could be performed as an activity at the lecture's end. At first, basics should be provided to students, then students could be grouped. In my opinion, collaboration wouldn't be effective with scientific curricula (e.g., mathematics and physics) as it doesn't include perspectives, it is just standing information {/definition}

Themes – Based on the questions and content or issues discussed: Table 20 below shows the main themes and sub-themes that were originally identified from the data. Examples are given of quotations or rephrased excerpts for each of them that led to their identification as such. The last column gives the frequencies with which each excerpt in this findings chapter was initially found to be present in the data. They reflect the prominence of those themes and sub-themes.

**Table 20: Frequency analysis of the emergent themes in the data**

<b>Theme</b>	<b>Sub-Theme</b>	<b>Example</b>	<b>Frequency</b>
Definition of CL	General	Likened to brainstorming.	17
	Emphasis on purpose	For problem solving.	10
	Emphasis on involvement	Discussion between groups of students.	13
Experiences	In teaching	Takes time compared to other methods.	4
	In previous schools	It was used only for testing.	4
	CL type	TCL, computer based (non-CSCL), and CSCL.	4
	Enrichment/What it enables	An exciting experience.	7
	Benefits	Provided clear outcomes.	9
	Restrictions	Students have to complete the curriculum.	4
	Of students	A paradigm shift.	5
	Effective tools	Tools increased students' learning spirit.	9
	Effective methods	The results were very interesting.	5
	Positive experiences	It created an amazing system that improved learning outputs for weak students.	6
	Challenging experiences	Some students get distracted.	1
Benefits Realised by Teachers	Methodological	It leads to intellectual construct among students and sharing experiences.	5
	CL tools	Forums allow discussing and submitting ideas.	10
	Learning/Knowledge	It helps acquire much knowledge and experience.	6
	Skills/Experience	Improved achievement among pupils.	8
	Interaction	Students learn better from other students.	18
	Students' attitudes	Makes the students concentrate.	2
	Convenience	Overcomes time and space constraints.	4
	Personal benefits	It breaks the routine.	1
Benefits for Students	Methodological	It's an easy and flexible method.	6
	Interaction	Reaching the professor is easier via the computer.	3
	Learning/Knowledge	CL helps to remember information better.	4
	Personal effects	The learner acquires a personality, productivity, and positivity.	6
	Other benefits	Even the shy can participate.	7

Challenges	Institutional/Training	No support or motivation to use technology.	2
	Curricula	Curriculum doesn't require CL.	3
	Teacher related	Professor leaves without providing any participation.	4
	Resources	Not enough electronic equipment.	2
	Tools/Devices	Technical problems.	4
	Student related	Miscommunication between students.	1
	Knowledge/Skills	Difficulty using the computer.	4
Provision	Strengths	The software is sufficient.	3
	Shortcomings	Computers/internet not available on Fridays and Saturdays.	3
Facilitators	University	Incentives for students.	6
	Teacher training	Holding training courses.	10
	Teachers' skills/attributes	Need for provide simulation models and seminars.	3
	Equipment/Furniture	Cabinets for students.	1
	Devices/Tools	Forums are best when there are discussions.	8
	Resources/Support	A supportive environment is important.	7
	Tasks/Roles	Balanced group.	3
	Information/Planning	Information imparted to students.	4
	Encouragement/Motivation	Encouragement to participate.	15
	Guidance/Supervision	Supervisors for students.	3
	Learning	Involving students in the method.	3
	Reporting/Feedback	Performance evaluation.	2
Future Outlook	Prospects at university	CL can help low-achieving students.	5
	Outlook in KSA	A new generation with high communication skills.	4
	Change drivers	Saudi Vision 2030.	13

While going through the data, it was observed that certain keywords and phrases were the focal points and occurred frequently. These were identified as the themes and sub-themes. The themes were selected as those that were judged to be relevant and which addressed the research questions to provide the required data. Mind maps were then constructed to present the connections or branches visually, and these were then discussed by comparing what other participants said on the same themes. The categories thus emerged from the data instead of being predefined. Nonetheless, this is a strategic process that considers “the primary questions, goals, conceptual framework, and literature review”

(Saldana, 2013: 177). The initial themes identified were then “woven together during later cycles to detect processes, tensions, explanations, causes, consequences, and/or conclusions” (Rubin & Rubin, 2012: 206).

### 7.3 Definitions of CL

Definitions of CL from the literature were given earlier in section 3.3. This subsection presents further definitions given by participants in the collected data.

#### 7.3.1 General definitions

Many interviewees defined CL in a general way and vaguely. Thus, CL was mentioned (n=17). For instance, one described it simply as “one of many methods of teaching or modern teaching strategies and training strategies as well”. Similarly, it was recognised as “self-education” and a “type of education” without elaboration, but another clarified it as “an integrative role-based education”, and by this, he meant:

There must be a teacher aware of the idea of collaborative learning to be aware of the roles and role of students and be able to distribute those roles well, which ultimately leads to the achievement of the goal of the educational session. [Dr J]

One teacher likened CL “to brainstorming”, whereby every student becomes “part of the educational process, not only a receiver of the information”, suggesting their role becomes more active. Another participant reported that this form of student participation is “to get information in a way making him/her full concentrated in the lecture”. One purpose of CL mentioned was that “collaborative learning is a process that supports learning”, especially, as another said, by acquiring ideas from colleagues and obtaining new information. According to one student, obtaining “further and different information” is easier through collaboration, especially due to the grouping. Moreover, it provides the opportunity to correct information and make it “more accurate”. A few lecturers described this information as “answers” and highlighted this as a benefit to others.

It was also defined from the perspective of learning as “A learning style where students are grouped into groups with different knowledge levels”. This definition emphasises the grouping of students where each group “act[s] as one group or one teamwork”. Many definitions specifically mentioned this grouping aspect. For example, one described the procedure of grouping in detail:

In collaborative learning, students are distributed to specific groups. These groups are distributed on O-rings or Y-shapes, discussing a certain topic. After that, groups discuss with each other. Some answers are taken from each group. Then these answers are shown on the board. After that, groups are being scored to motivate them. Some tasks are given to them to motivate them to solve a certain task. [Dr F]

### 7.3.2 Definitions that emphasise purpose

Definitions of CL as an emphasis on purpose were mentioned (n=10). For instance, One CL definition stated that the direction of the group's effort is in "*a new environment based on a group of students to solve a certain problem, adopt an idea, or learn a new thing assigned by the teacher*". One mentioned that "the lecture or the division is distributed among working groups", which suggests each group is given different tasks. Another teacher made this clearer, by stating: "*In collaborative learning, students are distributed to groups, and learning tasks are distributed to each group*".

One teacher admitted the purpose is also "*to arouse the enthusiasm of students so that the student in collaboration with his colleagues in the presentation of a set of ideas and discussion and develop solutions to some problems that may arise during the collaborative process*". Another emphasis found in the responses was on the creation of learning materials. For instance, it was mentioned that "*learners create the educational material together, to reach to the concept it seeks for*". A related constructive purpose mentioned by a student is that it helps to gather ideas, "*both the right and wrong ones*", and this teacher stressed the need for "*a corrector... who understands the answer on this topic*".

### 7.3.3 Definitions that emphasise involvement

Definitions of CL emphasised involvement. For example, CL as a form of involvement was mentioned (n=13). One student stated that CL is an involving "*discussion between a group of students, under the teacher or the faculty member*". Another also described the opportunity to "*discuss a certain idea or topic, write their ideas about the topic, and then meet together to produce a product or certain idea*". Notably, CL makes it possible for the content of all this discussion to be "*submitted*".

Only one teacher defined CL as involving interaction. He described it as "*learning in which students are interacting with each other more than traditional education, and this type of learning allows students to benefit from each other*". One of the benefits is that "*you collaborate with your friends to find the answer*", and in a focus group one student said:

The positive about this is that students who didn't get the information from the same professor can take benefit from their colleagues. The negative thing is that one or two persons cannot understand. [FG5]

Those who emphasised it as a process stated: *“It is a collaborative process between more than one student to achieve a definite objective to learn it”*. Another described is as follows: *“There is a posed question, and you can find an answer with your group and your colleagues, where each one provides his answer, then the correct one is chosen, and the wrong one is excluded”*. This can be described as a process with pedagogical implications from a question to an answer.

## **7.4 Findings from the Initial Group Discussion**

The initial group discussion was arranged to introduce the research to the students and make them feel comfortable participating and familiar with the topic before conducting the observations and focus group sessions. However, some useful data emerged in this first research phase as well. The brief discussion after the introduction revolved around the following areas related to CSCL: definitions of CL (see also Table 21 below), opinions on CL, previous experiences of CL, elements that facilitate CL or make it effective, factors that hold up CL or act as barriers, and the potential of CL to support learning and reasons why. The disciplinary background of the students was mixed. They were from the departments of medicine and humanities.

The students arrived at four definitions, all of which emphasise CL for obtaining or correcting information. The fourth stated: *“It is learning, as you can get further information from others, or you may correct your information from others”*. Their opinions acknowledge CL as *“a modern method”*, *“easy and flexible”* for passing information, *“better”* than *“old learning”*, able to *“provide more accurate information, and... remember information faster”*, making learning easier since *“the student writes the information by himself, so he has to pay attention to it”*, enabling *“thinking and to understand faster... so you will remember the information faster...”*, and so on. Again, this is another point of pedagogical importance. A commonality in these responses is that they all relate to information.

Some students did not have previous experience with CSCL. They had, however, experienced CL *“in a traditional form”* without using a computer, which *“greatly benefited”* them in tests. The students identified factors that facilitate CL as being able to remember information, repeat answers, *“deduce new ideas”* that give *“different thinking than traditional learning”*, that can *“widen your thinking”*, and so on. On elements that hold up CL, it is not so much *“shyness... but the limited time and malfunctions in some computers”* among those who have had experience of CSCL, and also those *“who aren’t cooperative”*. In addition, *“fast internet”* access is essential, and the method would have to be *“easily accessible”*, it should allow for writing *“information and [to] send it easily without barriers”*, the *“computers should be modern”*, and so on. This means the computer and the internet

must not be slow, and there must be no “*technical failures on the internet and the computer*”. All these things lead to “*time and effort saving*”.

As for the potential of CL in supporting learning, the students agreed, given that it can “*make students interact with each other ... to better get information and to form a new concept*”. CL benefits through “*high interaction between students*”. It is also convenient, as participants reported being able to “*write his information and wait for a response*”, unlike the traditional method. Overall, the students found CL to be “*very effective*”. One pointed out its ability to help students overcome their reluctance in communicating information:

I can get a piece of new information, unfamiliar for me, from qualified students. Many students have a sea of information, but they are ashamed to provide it or may be reluctant to feel that they have a wrong answer. In this way, this kind of student can provide all information they have. [Students in the initial group discussion]

**Table 21: Frequency analysis of the emergent theme of a definition of CL**

Theme	Sub-Theme	Example	Frequency
Definition of CL	General	Likened to brainstorming.	17
	Emphasis on purpose	For problem solving.	10
	Emphasis on involvement	Discussion between groups of students.	13

## 7.5 Experiences of Collaborative Learning

Data regarding two kinds of collaborative learning experiences were gathered: present or ongoing experiences and previous experiences. Data on the former were collected through observations, and data on both were gathered during the focus group sessions with students and interviews with lecturers.

### 7.5.1 Findings from the observations

These findings were obtained while observing the classes during their computer-supported collaborative learning. They are divided into fixed and non-fixed or dynamic observations. Four classes were observed: two technical and two non-technical, and one of each type was CSCL-based and non-CSCL (TCL). The procedure followed and aspects looked for to obtain these observations are detailed in section 7.9.3.

### 7.5.1.1 Fixed observations

The fixed observations were made in six areas: physical setting and features, participants, programme tasks and goals, learning tools, objects (artefacts), and other observations (see Table 22). Observations related to the first five areas are similar, except that Dr A2’s class was arranged in a hall rather than a regular classroom. In addition, Dr S2’s class used laptops instead of desktop computers. More differences were noted for the sixth area of ‘other observations’. Dr A2’s class, arranged in a hall, was described as having an “*excellent general environment*”, and Dr J’s class did not elicit any positive or negative description. However, the other two classes (of Dr F and Dr S2) have issues: Dr F’s class was noted for having an “*annoyingly loud*” air conditioner and unclear projector lens; Dr S2’s class produced an echo that affected the clarity of the teacher’s voice.

**Table 22: Fixed observations during the primary research**

Area	Dr A2 (Technical/ CSCL)	Dr F (Technical/ non-CSCL)	Dr J (non-technical/ CSCL)	Dr S2 (non-technical/ non-CSCL)
Physical setting and features	-Hall	-Traditional classroom -Circular arrangement	-Regular classroom -Arrangement: in the form of working groups	-Regular classroom
Participants	-All aged 19 -All male students -All wore the official Saudi dress	-Aged approx. 19 -All male students -Mixed clothing	-All aged 19 -All male students -All wore the official Saudi dress	-Aged approx. 19 -All male students -Mixed clothing
Programme (tasks and goals)	-Task: Teachers assign students to answer questions and do activities in groups -Goal: Avoiding mistakes and getting the right information	-Task: Teachers assign students to solve the related question in groups -Goal: Achieving their learning goals	-Workshop: Student assignment -Group work: Group leader displays what has been reached -Goal: Anticipate goals and present information	-Split into mixed groups to form smaller teams
Learning tools and resources	-Smart whiteboard -Laptop computer -Desktop computer	-Stationery: pens, paper, etc. -Smart whiteboard -projector -Desktop computers (not used) -Internet (not used) -Books -Articles	-Stationery: pens, papers, colouring pens, posters -Computer -Internet -Projector -Whiteboard	-Stationery: pens, paper, etc. -Laptop computers (not used) -Projector

Area	Dr A2 (Technical/ CSCL)	Dr F (Technical/ non-CSCL)	Dr J (non-technical/ CSCL)	Dr S2 (non-technical/ non-CSCL)
Objects (artefacts)	-	-Round arrangement of tables -Separate chairs	-	-Desks are not supportive, i.e., not facing each other as in Dr F's class
Other observations	-Excellent general environment	-Air conditioner is annoyingly loud -Unclear projector lens -Side discussions	-Stricter reinforcement of lesson requirements and objectives -Good student interaction	-Easy and clear tools -Echo in class due to lack of clarity of teacher's voice

### 7.5.1.2 Non-fixed observations

The non-fixed observations were made in four areas: activities, events, behaviour, and interactions (see Table 23). They pertain to both teachers and their students. The researcher also had access to the discussion forum, which was rechecked afterwards for confirmation. Some screenshots from this forum are attached in Appendix E. This enabled further closer observations to be made later without disrupting the observations while the classes were in progress.

Dr J's non-technical class activity was simply to search for certain information while the students worked in groups. This contrasts most with Dr A2's technical class, whose environment and course were planned more for a collaborative learning session. The other two classes (of Dr F and Dr S2) had issues of students not understanding elements, not being fully attentive, and not participating, despite, in Dr F's class, the teacher giving extra encouragement and making his students brainstorm for ideas. The events, behaviours and interactions observed by the researcher reflect these differences.

In Dr A2's class, there was greater ease of participation, communication, and opportunities to express ideas openly, thus sharing ideas and overcoming barriers to shyness. Consequently, although some student responses were inappropriate for the ideas raised, it was noted that the collaboration led to many students extending their understanding of the presented ideas. The atmosphere in Dr J's class was more competitive between groups. Although the collaboration was clearly noticeable and interactive, smiling, and confident among the students, some did not interact or participate. Side-talking was also noticed on topics unrelated to the study. The issues were greater in the other two classes (of Dr F and Dr S2). The researcher noted unease with sharing; lack of confidence, listening and interaction; hesitation; non-participation by some students; and side-talking. More seriously, distrust was noticed among some students in Dr F's class. In Dr S2's class, there was carelessness,

mocking and scornfulness, and unauthorised use of mobile phones despite some instances of confidence in serious and active interaction.

**Table 23: Non-fixed observations during the primary research**

Area	Dr A2 (Technical/ CSCL)	Dr F (Technical/ non-CSCL)	Dr J (non-technical/ CSCL)	Dr S2 (non-technical/ non-CSCL)
Activities (collaborative and sequencing)	-A workshop discussion was held on Blackboard, and some ideas were discussed with students. -Students entered the system and saw the ideas presented for discussion.	-Frequent questioning -Some students don't understand the question, or listen to the teacher, or concentrate, or give attention -Encouragement by the teacher -Thinking about the topic -Brainstorming -Need for attention	-Searching for information	-Participation of students -Consultation with each other -Trying to find the right answer -Some students think to express their knowledge, but participation is not from everyone in the group
Events	-Sharing ideas among students -Extending students' understanding of ideas presented through a collaboration -Breaking the barrier of shyness for some students - Detail most aspects of the idea	-Some students hesitate -Non-participation of some students -Lack of listening by some students -Taking answers from some groups -Students lack confidence in themselves	-Competition between groups	-Refer to a professor and ask him to explain more -Some students laughed and scorned the responses of some of their colleagues
Behaviour (of students)	-Ease of participation in responding to ideas raised -Ability to express opinions easily and conveniently -Some responses were inappropriate for the idea raised	-Uneasiness of sharing -Distrust of some students -Side-talking -Not interacting with some	-Confidence -Activity -Interaction -Rest -Smiling and expression of acceptance of teaching method -Non-participation by some -Non-initiation -Sometimes, not interacting	-Some students did not hear the responses because they were busy with other groups (carelessness) -Some students attempt to reach the 'correct information' -Busy with mobile

Area	Dr A2 (Technical/ CSCL)	Dr F (Technical/ non-CSCL)	Dr J (non-technical/ CSCL)	Dr S2 (non-technical/ non-CSCL)
			-Side-talks nothing to do with the study	-Talk outside the lesson objectives with each other
Interactions (among students)	<ul style="list-style-type: none"> <li>-Ability of students to see each other's responses, giving them opportunities to understand the idea in greater depth</li> <li>-Students work collaboratively to obtain an outcome</li> <li>-Ease and ability of students in communicating with each other</li> </ul>	<ul style="list-style-type: none"> <li>-Students feel collaboration</li> <li>-Work in homogeneous groups</li> <li>-Cooperation among them</li> </ul>	<ul style="list-style-type: none"> <li>-Strong collaboration with each other</li> <li>-Work in homogeneous groups</li> <li>-Collaboration with each other interactively</li> <li>-Strong focus of groups</li> </ul>	<ul style="list-style-type: none"> <li>-Confidence</li> <li>-Serious interaction actively and with vitality</li> <li>-Try to reach knowledge and information in one way or another</li> </ul>

### 7.5.1.3 Personal reflections on the observations

Personal reflections have been made by previous educational researchers to document observations, such as Gouzouasis (2012: 75), on creative instructional strategies, and Keengwe (2015: 122), who reflected on students' online interactions under technology-enhanced pedagogy. Thus, this subsection details the researcher's personal reflections on the observations of the two classes in which collaborative learning took place without using a computer and the two computer-based classes. In the classes in which a computer was not used for collaboration, i.e., the two non-CSCL groups, the collaboration was done in a very positive environment compared to the computer-based classes. No computers were used while working collaboratively, but the place was still conducive to collaboration in other ways. For example, the seating arrangement was circular (oval), so the students faced each other, and the atmosphere was social and interactive.

Hail University provides students the computer-based classes using an online discussion board to collaborate by means of the Blackboard software. The students tried to use a wiki, with the teacher's permission, which involved feature learning and used some blocks. In Blackboard, there is a discussion board the students use to collaborate. The Blackboard sessions were formal, and the boards were used *within the allotted time limits in classes*. Although the non-CSCL classes did not use

Blackboard or any other CSCL tool during their observed classes, they have access to Blackboard at different times.

The observations were done as neutrally as possible. There was no involvement or interaction with the students, at least not while the observations were being conducted. The researcher deliberately chose this non-participant approach to avoid influencing the students' collaborative behaviour. **Most aspects noted during the research were as expected due to the literature reviews conducted in advance**, but a few were a little surprising or unexpected. One of the expected features was noting that some students do not talk much with the teacher. They are not responsive or forthright, or they do not respond when asked about something. However, some of them did become more open and interactive while collaborating. That is, there was greater peer-to-peer interaction between the groups rather than between students and teachers. Even those students who did not seem to know anything or have any information in front of the teacher appeared to be more knowledgeable while interacting and collaborating with their fellow students.

An unexpected observation was that all the students were generally on what may be considered as good behaviour, which is not normal from what the researcher remembers and experienced while teaching there. This could be because the students were aware of being observed, whether they were told about it or not, as the researcher's presence was obvious. However, it was noted that some students did not pay full attention to the teacher and what was being taught to them. A few students seemed unmotivated, distracted, or engaged in some frivolous activity, and one student was using a mobile phone during class time by hiding it from the teacher. In all these cases, the teachers seemed to be unaware or ignored what was going on. The only teacher who commented positively on mobile phones in classes was Dr S2 (see under section 7.4.3).

## **7.5.2 Findings from the focus groups on previous experiences**

This subsection presents the findings from the six focus group sessions held with students. The subheadings indicate the overall or key information that emerged from each.

### ***7.5.2.1 Student focus group 1 – only TCL***

No student in the first focus group had previous experience of using CSCL to describe. However, there was a prior experience in CL but without using a computer. This is discussed in the next discussion chapter.

### **7.5.2.2 Student focus group 2 – only in elementary school**

The students in this focus group experienced CL during their years at elementary school, which is equivalent to the primary schooling years in the UK, by being grouped into three or four groups. The head of each group collected the views together. As the result from this group led to various interpretations, this was coded as “*CL different views*”. Thus, the understanding of CL among students centred on “*the good thing is that the student shares his view*”. Furthermore, it was also stated that although it was difficult at first, “*over time, one started to learn, and there wouldn’t be a thing difficult in it*”. It encourages students to discuss, and the “*communication between students is fast*”.

### **7.5.2.3 Student focus group 3 – in high school science lessons**

The previous experience was in the biology laboratories while studying in a secondary school, before attending a university as in the second focus group. The students highlighted that they could ask the teacher a question and then discuss it further “*through a group discussion with other students*”.

### **7.5.2.4 Student focus group 4 – CSCL experience**

One previous experience was using Excel on middle- and high-school computers, followed by an oral discussion on “*how to organise things*” after the students were grouped. However, it was not the same “*like computer-assisted collaborative learning*”. Another student had an experience before secondary level when the teacher grouped them. A lecture was delivered via the internet, and the students discussed it afterwards for “*seeing views*” and matching ideas. Then they did homework using a Blackboard-like application that provided a forum with a YouTube link with additional explanations by their teacher.

### **7.5.2.5 Student focus group 5 – emphasis on benefits**

One student said: “*There were experiments that were nice, but we couldn’t make self-development to reach the level you are now*”. Others also had previous experiences. One related that when he was grouped he benefited from “*sharing*”. Another reported that “*the student responsiveness would be more, and thinking would be more*”, and another highlighted the benefit of being able to “*ask our questions in the group*” and mentioned that in case the information was not gained, “*the professor will provide it to you*”.

#### **7.5.2.6 Student focus group 6 – benefits and results**

The previous experience was “*in the form of groups*” for sharing “*answers and ideas*”. They collaborated using Microsoft Access, and “*the benefit was that everyone gives a result*”. An advantage experienced was that “*If you had the wrong information, the group may correct it and provide you with extra information*”. Also, “*we can get the answer within a shorter time, and there would be more sharing*”. Another student participated in a WhatsApp experiment in which there were groups and the answer was shared. Another used Microsoft Access to design a database and distribute the work, for which “*the results were excellent*”. Relevant themes for this are discussed in the next discussion chapter.

### **7.5.3 Findings from the interviews on previous experiences**

These findings on previous experiences with collaborative learning are based on responses from the lecturers during interviews with them. Some noteworthy descriptions of previous experiences: “*A paradigm shift*”, “*Amazing for students*”, “*It was a wonderful period... [and] a rich experience*”, and “*An exciting experience*”. These remarks are contained within the responses presented below of each of the interviewees.

#### **7.5.3.1 Teachers with some experience**

Three teachers had had limited previous experience of CL: A, K, and M. All the faculty members interviewed responded affirmatively when asked whether they had any previous experience of collaborative learning. However, it was, under a traditional arrangement rather than computer-based for Dr A, “*an excellent experience*” nonetheless. He said: “*It benefited students directly, but it takes time compared to other learning methods... However, collaborative learning [CSCL] provides more positive results for students, and you will be sure that students have the correct information*”. The tools he used were online “*educational forums*”, which he found to be “*a paradigm shift for students*” because the students “*liked this idea*”.

Professor K had previous experience in both Saudi Arabia and Egypt. His students were divided into homogeneous groups and given “*some initial ideas through brainstorming*” and the opportunity “*to express themselves*” using the Blackboard software. Using the tools was helped by reading about the collaborative learning process beforehand.

When managing seminars, Dr M’s experience focused on facilitating “*knowledge sharing*” to help participants develop skills. The students were grouped and used chat, video calling and forum tools.

### **7.5.3.2 Only tested previously**

The previous experiences of two further teachers were limited to testing CL. Dr Sh experimented previously with CL by grouping students during lectures and giving activities to each group. One experiment involved scientific research using a computer for content management. The collaboration took place remotely using both synchronous and asynchronous audio and video communication tools, forums, and emails for sharing information, discussing, and interacting, in order to find solutions to problems. The discussions finally led to submitting answers, and the supervisor selected the right answer. The teacher found that “*the audio and video debate and the virtual classroom were the most effective tools*”.

The previous experience for Dr J was in the same university in which collaborative learning was used during training workshops “*rather than education*” and as a “*method of self-learning*”. Additionally, he pointed out that Blackboard is used for “*the duties of students and some short quizzes*”, especially for course descriptions and scientific material. In Egypt, a professor’s programme “*was used for testing only*” as an instructional method for “*project management and computer-needed matters*”.

### **7.5.3.3 Richer previous experiences**

Two teachers had a more extensive or richer experience of CL. Dr O had had “*several experiences*” with CL in both schools and universities. Many of his learning designs have been based on this approach. For example, during his master’s thesis, he experimented on ‘discovery learning’, in which learners were grouped to perform certain tasks and everyone was given a handbook and different roles. There was a competition between the groups to complete the task first. He gave an example of grouping students in England who were then given an assignment to measure the thickness of a sheet of paper. In short, it was only after interacting and a learning process took place that the students devised a method whereby they could successfully accomplish the task – by stacking several sheets before measuring. The point is that it was a process of interaction, collaboration, and discovery.

Dr Y had also had “*many experiences where collaborative learning was used with students*”. It was “*an exciting experience*” that helped motivate the students in small groups, “*search on the internet, discuss with each other, and then provide answers*”. The tools used were Blackboard and chatting. Since it was a “*very excited experiment*”, the discussion extended during the lecture, and the students expressed themselves through typing more than verbally. It was found that students “*can also discover new skills... hear from all students*”.

#### **7.5.3.4 Previously experienced benefits**

Two teachers disclosed the benefits they experienced previously in using CL. For Dr S3, during the previous experience in the preparatory year, “*Most of the learning depended on collaborative learning and group discussion*”, “*It was a wonderful period*”, and “*a rich experience*”. The teacher used Twitter. He gave an example of asking a question that depended on critical thinking: “*there was no direct collaborative learning, but responses were within times close to each other. It may be considered a part of collaborative learning*”. Overall, the benefit was effective.

Dr F had been applying CL at Hail for the previous five years and finds it “*amazing for students*”, particularly scientific material. In the first two years, it took a traditional form and there were high dropouts but, since 2017, they have moved to CSCL with “*clear outcomes*” and have rooms “*fully designed for collaborative learning*”, such as having circular tables and the dropouts decreased in 2018. One exception where there is no CL arrangement is for English language learning. Where CL is used, it is used for teaching “*skills of searching, learning, and thinking, entrepreneurship, communication skills, and self-development which all depend on collaborative learning*”.

#### **7.5.3.5 Restrictions experienced**

One teacher highlighted a restriction experienced previously in using CL. The previous experiences for Dr S1 were while applying the computer curriculum. The teacher admitted that “*some students get more benefit from their colleagues than the teacher*”. This is because:

When the teacher is explaining the lesson, the student may be busy with other things, but when the student is included in the educational process with his colleagues, he would be more harmonised and better receive the information. [Dr S1]

However, Dr S1 is restricted by having “*to complete the curriculum*”, so CL was only used a few times, for which Blackboard was employed, and Google for searching. Irrespectively, the teacher is in favour of CSCL as well as other related benefits of using computers:

Collaborative learning using modern technologies is better than the traditional collaborative learning, as sources needed by the student are available to him. He can use the internet to get any information. [Dr S1]

#### **7.5.3.6 A national requirement**

Dr S2 pointed out that as per the Saudi National Quality Authority (NQA) and foreign standards (ACSB, EECSB), it is required that around 10-20% of the curriculum be taught using internet-based applications. The teacher used wikis and Blackboard. He also compared these with WhatsApp as an

example of another similar “*excellent*” forum that gives students opportunities to ask and have their questions answered.

#### **7.5.4 Findings from the interviews on present experiences**

This subsection of the findings reports on the responses given to describe the interviewees’ experience while being observed using CSCL, which some participants themselves referred to as the ‘trial’ or ‘experiment’. The data for these findings on present experiences of using CSCL were, as during the observations, collected from the lecturers and students during interviews with them (see also Tables 24 and 25 below).

##### **7.5.4.1 Effective CSCL tools**

Three of the teachers identified specific tools they found effective for CSCL. Dr A found the forum to be most effective. The CL tools provided at the university were “*enough*”. He found that “*the learning spirit of students increase[s], and there was good competition between students*”, all of whom were “*interested to learn and to take benefit*”. He compared this with traditional learning in which “*you note some inactivity*”.

Similarly, in Dr N’s class, the students were grouped and each group was given “*certain tasks*”. They then held discussions through a Blackboard forum and video conferencing and completed the tasks collectively. However, Google Docs was also used “*to do a collective search*” and upload their “*numerical order*” research. Overall, “*the last one was very helpful, but it was difficult at the beginning*” before “*the vision and problems cleared up*”, so he feels “*good*”.

Dr S2 applied brainstorming, peer learning, and “*created learning through role-playing*”, which he found “*very useful*”. However, he, too, found the forum to be most useful and effective as a tool. He believes, “*Collaborative learning has the advantage of ensuring that students focus on the topic of the lecture*” and therefore considers it “*useful for them*”. Still, he takes care that “*they don’t get distracted*”.

##### **7.5.4.2 Effective methods**

Some teachers elaborated on which methods they found effective in supporting collaborative learning. For example, Dr F uploaded “*topics for collective discussions with students*”, which they discussed before uploading it. The “*results were very interesting, [as] there were incentives and encouragement*”. He described their efforts as “*amazing with outputs that achieved our aimed objectives*” and the overall experience as “*very interesting and beneficial*”. It helped “*through*

*encouragement and competition, and to give the student enough time to view his opinion, and through groups and when students hear from groups”.*

When Professor K raises a subject or problem, he *“leave[s] it to students to express themselves but within the framework of university values and norms”*. His role is to *“also ensure that the dialogue and the presentation of problems do not depart from the issue at hand... [and that] students listen to some very important guidance”*. He allows them *“to express their different points of view”* and is careful to ensure *“these ideas can be implemented... [by] avoid[ing] clashes between students in the presentation of their problems which may be overlapping with each other”*. Overall, he found it to be *“a worthwhile experience, but it needs the support and guidance of the faculty and educational institutions”*. As far as learning is concerned, the experience helped the students *“to some extent”*.

Dr S1 found that CL *“succeeds in some subjects and not others”*. Regardless, it enables the teacher to give a lecture and to use engagement *“as an activity”* afterwards. As a result of the experience, he recommends providing students first with *“basics”* before grouping them, and, since it is *“just standing information”*, stated that CL *“wouldn’t be effective with scientific curricula”*. The aspect that makes CL effective is the internet, *“as it opens education sources needed by students”*. The teacher gives guidance but does not provide *“information directly, so the internet was the best solution to this problem”*, including forums for which the teacher can provide advice. This is in addition to the Blackboard system available at the university. During the experiment, *“lesson ideas were distributed... and each group was able to study this idea and get a result together... [and] they reached the required objectives”*. The students were *“in a good manner... so the lecture went smoothly, students got the benefit, and they enjoyed it”*. He found that students had *“more capacity to understand the lesson”*. Overall, *“It was a worthwhile experience, but there was a negative point which is the time factor”*. They managed to *“complete the curriculum... but collaborative learning makes providing the student with information and completing the required curriculum slow”*. This was *“the only negative”* thing experienced.

#### **7.5.4.3 Positive experiences**

During this study, several teachers expressed their contentment or satisfaction with their present collaborative learning experience. Dr M considered it *“worthwhile”*, as it was *“an organised session”* that contributed *“to achieving curriculum objectives through technical and collaborative learning”*.

Dr O divided his class into groups of mixed ability and gave his students a design task. They presented their work both individually and then together. Notably, the *“cooperation within groups created an*

*amazing system that improved learning outputs for weak students*". For him, *"The most important thing in these experiments is that there was a success and happiness in students' eyes"*, and this makes education *"an interesting thing"* and *"a pleasure"*.

Dr S3's experience, which involved using a wiki for one semester during an English language course, *"was an interesting experience"*, particularly the *"significant interaction between students"*. Overall, *"It was a rich experience"* and *"a very exciting experiment"*. The teacher's role was *"to supervise the educational process, [and] he was only responsible for managing discussions"* with the aim *"to increase the critical thinking of students"*. He achieved this *"by putting particular questions, taking students' impressions, making students discuss it, and finally measuring the objective to identify whether it had been achieved through the brainstorming or not"*. He also found it *"useful for the faculty member"* as well as for the students. Notably, *"Students preferred to go with collaborative learning rather than the traditional lecture, as they didn't feel of the time while collaborative learning and while interacting with others"*. As a result of their experience, he found that their *"self-confidence increase[d], and communication skills increased with the discussion and communication"*.

In Dr Y's experience, there was *"preparation... [and] behavioural and procedural objectives"* before the lesson, and *"many tools"* were used. Faculty members and students made *"great contributions"*. He was involved in supervision, *"deleting some stuff, printing the verbal discussion, students' skills, the main knowledge, and the subheadings"*. Overall, it was a *"worthwhile experiment, and it was good for all faculty members to use collaborative learning"*, especially as it *"provides students with new information, and they get new experiences"*. He also found it useful for building personality and for students to *"learn constructive theory"*. The discussions enabled students to *"build new ideas that could lead to an authentic education"*. Specifically, it was the *"organisation and interaction between students"* that helped them get *"new ideas, new experiences, and new information"*, and the dialogues and discussions *"were significant... that helped students to gain experience"*.

For Dr J, the present CL experience began by first *"practising the use of Blackboard by learning how to upload the material on the Blackboard and dispense with paper books"* before proceeding with university seminars, questions and answering students' queries. The overall impression was *"certainly it was more effective"*, satisfying and *"a pleasant experience"*, as there was *"more interaction on the part of the students in the sessions"*. For the teacher himself, the experience showed that CL *"has a very important role in the educational process to increase student interaction"*. There was also no disruption, *"so the experience was very positive and added more information, making the student interaction more positive"*.

#### 7.5.4.4 Realised benefits of CL

]“each tool has the advantage in time”, alluding to the time-saving potential of computer technology and claimed for CL. It remains, however, that there are “*appropriate subjects... so there is no tool better than the other*”. During the present CL experience, a chain plan was made to show the required objectives to the students first before assigning the tasks for them to achieve. Then feedback was given finally. He found that CL “*saved a lot of time*”. Moreover, he stated:

It makes me a mentor and... [enabled me to] follow up with students and let them discuss and interact... allowed me to provide the feedback, guide students, distribute activities among them, give them their roles, receive problems and solutions, and organise the work. [Dr Sh]

His contribution was grouping the students and then “*organising roles, guiding dialogues... [providing ]feedback to groups, and providing the final solution to all groups*”. As a result, he found “*all students remain attentive and very attracted, as their brains are stimulated*” and attributes this to the “*competition to get the highest learning degree*”.

**Table 24: Findings of key features of the four observed classes**

Area	Dr A2 (CSCL/ technical)	Dr F (TCL/ technical)	Dr J (CSCL/ non-technical)	Dr S2 (TCL/ non-technical)
<b>Setting and features</b>	Hall (not a classroom)	Class in a circular arrangement	Grouped in a classroom	Mixed groups in a classroom
<b>Participants</b>	19-year-old males in official Saudi dress	19-year-old males in mixed clothing	19-year-old males in official Saudi dress	19-year-old males in mixed clothing
<b>Task/Goal</b>	Questions and activities to get the “right information” correctly	A question to achieve their learning goals	An assignment and group work to display	Split into smaller teams, finding the right answer
<b>Tools and resources</b>	Whiteboard and computers	Stationery, books, whiteboard, projector, articles	Stationery, computers, whiteboard, projector	Stationery, projector
<b>Objects/ Environment</b>	“Excellent” environment	Tables in a circle, loud AC, unclear projector	Strict lesson reinforcement, good interaction	Unsupportive desks
<b>Activities</b>	Discussion and presentations on Blackboard	Questioning, encouragement, brainstorming, inattentive students	Searching for information	Participation (not all), consultation
<b>Events</b>	Idea sharing, more understanding, overcoming shyness	Some hesitation, non-participation, lack of listening, lack of confidence	Competition between groups	Some students are not seriously asking for explanations

Area	Dr A2 (CSCL/ technical)	Dr F (TCL/ technical)	Dr J (CSCL/ non-technical)	Dr S2 (TCL/ non-technical)
<b>Behaviour</b>	Easy participation, expressed opinions, some inappropriate responses	Unease in sharing, some distrust, side-talking, some not active	Confidence, activity, interaction, some don't participate, side-talking, smiles	Some responses not heard, some attempts to get the right info, mobile phone use
<b>Interactions</b>	Able to see others' responses for ideas, ease of communication	Homogeneous groups, good cooperation	Strong focus, interaction, and collaboration, homogeneous groups	Active interaction, confidence, attempts to gain knowledge

**Table 25: Frequency analysis of the emergent theme of Experiences**

Theme	Sub-Theme	Example	Frequency
Experiences	In teaching	Takes time compared to other methods.	4
	In previous schools	It was used only for testing.	4
	CL type	TCL, computer-based (non-CSCL), and CSCL.	4
	Enrichment/What it enables	An exciting experience.	7
	Benefits	Provided clear outcomes.	9
	Restrictions	Students have to complete the curriculum.	4
	Of students	A paradigm shift.	5
	Effective tools	Tools increased students' learning spirit.	9
	Effective methods	The results were very interesting.	5
	Positive experiences	It created an amazing system that improved learning outputs for weak students.	6
Challenging experiences	Some students get distracted.	1	

## 7.6 Potential Benefits of Collaborative Learning

It should be noted here that CL refers to collaborative learning in general, whether traditional non-CSCL (TCL) or CSCL; CSCL refers to CL supported by using a computer; and non-CSCL to TCL without the use of a computer. However, the context in which a lecturer said something about CL, whether in a CSCL or TCL/non-CSCL class, is noted for the long quotations.

### **7.6.1 Potential benefits according to the lecturers**

The data for the following findings on potential benefits of CL were obtained during the interviews with the lecturers.

#### **7.6.1.1 Teaching methodology and tools**

As a method, “*The most significant one is that in any educational material, you can practically apply collaborative learning*”, which, this interviewee claimed, can lead to achieving the objectives. Others likened it to “*brainstorming between students*”, which, one reported, “*occurs through the group discussion so that an idea may generate many ideas*”. In this way:

It serves the classroom and the constructivist theory. This theory is based on learners’ previous experiences and adopting an idea or new information by learners themselves, to build new knowledge through studying it together, and sharing the previous or new experiences among them. [Dr Y]

Similarly, another interviewee described this as an “*intellectual construct among students, sharing experiences... to get new skills and knowledge*”. The purpose of the collaborative learning method is represented by one as “*to convey the information to the student so that he/she can remain concentrated for as long as possible in the lecture, as some students are sitting distracted*”. Given this, the interviewee mentioned the benefit that it “*makes the student concentrate in the subject of the lecture*”.

Two collaborative tools were identified when discussing the benefits of CSCL specifically: blogs and forums. The blog was liked by one interviewee for having shared information “*appear to other students*”, and the forum “*for discussion and submitting ideas*”. The blog, in this case, is used as a collaboratively written platform rather than merely as a repository for information.

#### **7.6.1.2 In comparison with traditional methods**

Two key contrasts with traditional learning are that CSCL “*overcomes time and space constraints and qualifies students to study and learn in a synchronised manner*”. The absence of time and space constraints means that students can continue their learning outside the classroom at another place of their choosing, including their own home, and they can do so at any time convenient to them. One professor said collaborative learning “*is easier than other traditional methods*”. He also added that he considers it effective because its “*outputs are high and quick*”.

One teacher drew a comparison with traditional methods to highlight the benefits of CL. Under a conventional view, in his opinion, students’ concentration is less, it takes “*much time*”, you cannot be sure the desired objectives have been achieved, “*some students may be ashamed to ask*” questions,

the opportunity for speaking is less, and students “*would miss the opportunity to ask a question, as sometimes you find yourself moved to the next point without understanding the first one*”. However, due to the benefit of increasing enthusiasm, one teacher views collaborative learning as “*one of the best teaching and learning strategies*”.

### **7.6.1.3 Knowledge and learning benefits**

According to one interviewee, “*Acquiring knowledge in any part of knowledge or skills is very important*”, and “*collaborative learning is always useful in acquiring skills*”. It also develops communication and teamwork skills and supports knowledge-sharing between students. This, in turn, supports learning, which is attributed to the previous experiences, providing new information, building knowledge and skills, and holding discussions.

Importantly, at the university stage, students “*must learn... how to learn*”, for which collaborative learning is “*one of the most effective methods*”. Another fundamental benefit is that CL leads to students understanding the ideas well, which another interviewee described as helping students to “*remember the information better*”, thereby reinforcing the acquisition of information.

Collaborative learning helps cover “*some learning gaps... especially when they are in a group, and the student asks his colleague*”. In this way, a “*student can read his colleague’s idea, and then he can improve it*”. Another claimed, “*If collaborative learning is applied properly, it will be an amazing learning, means it will provide students with many things and knowledge*”.

By supporting self-learning, collaborative learning

is active learning... It gives the learner a greater opportunity. It allows the teacher to guide the education process to be more a facilitator and discover the learners’ weaknesses. [Dr O]

In this way, the student’s “*learning increases much more than learning by watching or negative learning*”. Another who compared collaborative learning to individual or ‘self-learning’ claimed: “*collaborative learning is more wonderful, as it has a great advantage, the learner works in a teamwork environment, so the learner learns while working with others*”.

### **7.6.1.4 Skills and experience**

In the experience of one teacher, the implementation of CL led to an:

Improvement in the level of students’ achievement in addition to increasing their acquisition of skills, so that the student who is looking for information and helps to deliver it, and this helps him acquire skills... [Dr J from an observed CSCL class]

Three key benefits are mentioned in the above response: the professor noticed improved achievement, increased skills, and students' access to the information they wanted.

#### **7.6.1.5 Interaction, communication and teamwork**

One interviewee highlighted the importance “*for students to be interactive in the classroom*”, and CL additionally “*supports self-learning and the search for information*”. Interaction and cooperation support teamwork, which leads to “*build[ing] the concept together*”, and the latter support independent learning as additional benefits. Notably, as one interviewee stated, this form of learning enables “*students [to] learn from... [other] students better than learning from a teacher*” [Dr Sh].

Ultimately, as one put it, “*Learners feel that they succeed together*”. Through teamwork, the students can see and talk with their colleagues, solve problems together, “*or make analysis, so this would generate a type of encouragement and competition*”. Another linked discussion with skills:

I think that dialogue between students and giving the student the opportunity in the discussion, decision making, and explaining a certain meaning, make the student gain a lot of skills and knowledge. As discussion and dialogue make the student gain new skills and knowledge. [Dr Y]

One teacher highlighted the fulfilment of objectives: “*Collaborative learning supports education, as it helps to achieve objectives easily through groups, participation, and dialogue, so it supports learning*”. On the other hand, this may contradict the benefit of collaborative learning, allowing students to compete and instilling a “*spirit of competition*”. One teacher said it is this allowing to compete that makes “*collaborative learning... one of the best learning means*”, but also added:

Peer learning methods are useful for students, i.e., they discuss and interact regarding homework, tasks, and solutions, then each group reports to the other group with its results and experiments, so this maximises benefits. [Dr Sh]

#### **7.6.1.6 Other personal benefits to students**

One interviewee who described CL as “*an amazing thing*” highlighted benefits to students in that it can help “*with some problems like shy[ness, and to] acquire much knowledge and experiences*”, and another said CL “*eliminates shyness and inattention*” and provides “*motivation [and] encouragement*”. Yet another mentioned enthusiasm and self-confidence and the opportunity for each to express themselves. Finally, another expressed a benefit of CL in that it “*discharges students' energies*”, to describe the success in engaging the students.

This motivation is achieved because, according to another interviewee, CL “*breaks the routine*”. Another similar benefit is that collaborative learning “*makes the lecture full and informative, and*

*away from the boredom of the student... and attracts the attention of the student*". The collaboration here is during follow-up learning after the lecture, which is online. The one who mentioned self-confidence said this is because "*the presence of the student within a group of peers enables him to express these ideas well*".

In short, as one teacher said, "*the learner acquires a personality, productivity, and positivity*". Another interviewee also said it builds personality due to the learning support. In addition, students also learn from each other. Therefore, if the group is "*well-distributed... [students] take benefit from each other*". Given these additional benefits to students, one professor expressed his wish in these words:

I encourage collaborative learning and make it more prevalent at all universities and even at all high schools. Collaborative learning makes the student like the curriculum and university, instills the spirit of competition, and is proactive. Collaborative learning paves the way for the student to get rid of shyness. Students [are] ashamed to comment in front of another student[s]. Here we get rid of this negativity, as when the student colleague motivates him to answer, this will instill the spirit of diligence. [Dr F from an observed TCL class]

In addition to the above, collaboration gives all students "*a chance to exist*" through teamwork. This response is discussed further under 'interesting remarks' (section 7.11)

## **7.6.2 Potential benefits according to students**

The data on potential benefits were obtained from the students themselves during the focus group sessions with them.

### **7.6.2.1 Benefits as a method**

The method of collaborative learning was described in one focus group as: "*A modern method [that] helps in finding collaboration between students. It is an easy and flexible method to pass information to students*" [FG1].

In another group, this modernity was described instead for CSCL specifically as "*the era of technology*" by which "*you can reduce time rather than participation one by one*". The student referred to the ability to multi-task using technology rather than CL per se. Others also mentioned that CL gives "*time and effort savings*". One student put figures to this time saving: "*it would be 5 or 10 minutes rather than 20 or 40 minutes*", which would give savings of between 10 and 35 minutes. It is not clear how CL saves time, and the student was again referring to computer technology in general and thus to CSCL. Another description of CL as a method was that "*It is a meaningful method.*

*It would be less complex and more positivity for everyone, as all would participate and express his opinions, like other learning methods”.*

### **7.6.2.2 In comparison with traditional methods**

The students also drew comparisons with traditional forms of learning. For example, under traditional, or “*the old learning*” as one group described it:

The teacher just explains the lesson... sometimes the students pay attention to the teachers and sometimes not, as the teacher provides information. In collaborative learning, the student writes the information by himself, so he must pay attention to it... it helps in thinking and to understand faster than the method where the teacher only explains and delivers the information. [FG1]

When the student wrote “*writes the information by himself*”, he meant that the teacher is not present to tell the student what to write, as in traditional teaching. Although there is collaboration between the students, each participating student writes independently. On the other hand, one student said, “*it is harder to get things [done] in a collaborative manner*”, but turned this into a benefit by adding, “*so it would be hard[er] to forget it*”. The point about only the teacher providing information in a traditional method was made clearer in the following in referring to CL and the benefits of learning together:

It is useful for our generation and the next generation, as all previous education was just listening from the same professor... but here, all students share and solve the problem together. This is a good and nice thing. [FG5]

Notably, another reason for collaborative learning being “*better than the traditional one*” is that in the case of CSCL:

The student may be ashamed to respond or discuss with the professor, but through the computer, he can get the information and respond without discussion... If I cannot gather information or write anything, it will be easier to depend on another one [student]... so the traditional method would be more annoying. [FG1]

One aspect highlighted here is that although CL usually involves greater discussion, it also provides the opportunity for students to contribute to the case of CSCL by typing or otherwise giving information without making any audio or vocal contributions. In a non-CL F2F situation, a teacher would expect the student to say something, whereas CL allows for communication and information sharing without necessarily saying anything. One student described the traditional system as “*boring*” compared to CL, which he described as “*excellent*”. What differentiates the two in the case of CSCL is technology and “*the opportunity to participate, but in the traditional method, it is difficult that all students participate*”. For another, collaborative learning “*is much more effective than traditional education, as it depends on discussions with others*”, and one main factor in this is that you can have

*“better education... without needing to have books by owning a better course”*, or, as another said, *“searching in libraries for the answer”*.

### **7.6.2.3 Interactions**

A key feature that makes collaborative learning advantageous is the interaction between students and teachers and the interaction among students. Regarding teacher-student interaction, as one student pointed out, to obtain information in the case of CSCL, *“Sometimes, reaching the professor is difficult, but it is easy with the computer... [or] perhaps you don't have email, [but] you can discuss on the website”*.

For interaction among students, as one student said, CL *“makes students interact with each other, which helps you to get new additional information... helps you to remember information”*. In another group, it was mentioned that it *“helps the student to think about the information”*. Furthermore, *“it helps students to discuss their ideas... so we can have the best answer”*, or, as another put it, *“You can get ideas quickly, and you can develop the information properly”*. Similarly, in another group, it was mentioned that *“it improves cooperation between students and helps them get to the right answers”*.

This ability to discuss and cooperate makes *“the atmosphere... more effective”* under collaborative learning, as it *“causes no distraction among students”* and allows interaction and the making of friends. One likened this to *“brainstorming”*. Further benefits were mentioned and attributed to teamwork and sharing of ideas:

The teamwork breaks barriers... there may be barriers between them as they don't know each other. It makes them identify each other, and each one provides his ideas. Then these ideas are gathered as a piece of information... rather than having a little idea, you share your ideas with the same group, and this broadens one's horizons... as it adds to you and your colleagues' different points of view, so you can look at the topic from different sides. [FG2]

As one student pointed out, the number of views increases by sharing ideas. Using words expressed in another group, the benefit is that CL allows all students to participate. By looking at a topic from different sides, the advantage is that *“we can deduce various views”*. Another said that *“We can understand together and get the answer”* by this means. Moreover, by sharing information with other individuals, *“It would be more interesting, and there would be a spirit of cooperation”*.

### **7.6.2.4 Impact on learning and knowledge**

According to students in one focus group, the learning between students and the teacher *“acts as a guide for students... provide[s] more accurate information, and students would remember*

*information faster. Learning would be easier for the student and the teacher himself*". One reason for remembering information easily mentioned in another focus group was that *"Answers may be repeated... you will deduce new ideas and answers, as it will not be limited to one thing... and it facilitates the learning process"*.

Students *"can know information from colleagues with ease"*. Even if there are differences of opinion, collaborative learning helps *"develop persons... where there is interaction, and the information is rooted"*. As mentioned in another group, *"Just getting information from one source... isn't enough... it is useful as there are various opinions so you can correct your answer"*. This points to the benefit of having 'multiple sources' in CL, although this term was not used.

Another benefit is that if a student makes a mistake, CL allows for something to be done about it. As one said, *"The mistake and the practice will be modified, and with time all will take benefit of the group"*. This process is how *"accurate information"* is achieved through CL.

#### **7.6.2.5 Additional benefits for students**

Several additional benefits for students were mentioned. For example, one student said that CL *"is useful more for self-development, as the one wouldn't continue on one idea, his colleagues may correct or change his idea... it also broadens the horizon"* [FG4].

Another benefit is that *"even the shy person can participate... it breaks the shyness barrier so that the person would have more self-confidence"*. It thus helps overcome shyness and allows students to express their opinions:

[CL] limits the shyness of people who cannot face others. It is easy, as everyone can express his opinion and participate, even the shy one can express his opinion and participate. All can provide their opinions. All can provide and get a benefit. [FG4]

In addition to the opportunity for self-development and helping to overcome shyness, it was also mentioned that collaborative learning gives students self-confidence.

**Table 26: Frequency analysis of the emergent theme of Benefits Realised by Teachers**

Theme	Sub-Theme	Example	Frequency
Benefits Realised by Teachers	Methodological	It leads to intellectual constructs among students and sharing experiences.	5
	CL tools	Forums allow discussion and submission of ideas.	10
	Learning/Knowledge	It helps acquire much knowledge and experience.	6
	Skills/Experience	Improved achievement among pupils.	8
	Interaction	Students learn better from other students.	18
	Students' attitudes	Makes the students concentrate.	2
	Convenience	Overcomes time and space constraints.	4
Benefits for Students	Personal benefits	It breaks the routine.	1
	Methodological	It's an easy and flexible method.	6
	Interaction	Reaching the professor is easier via the computer.	3
	Learning/Knowledge	CL helps to remember information better.	4
	Personal effects	The learner acquires a personality, productivity, and positivity.	6
	Other benefits	Even the shy can participate.	7
	Change drivers	Saudi Vision 2030.	13

## 7.7 Barriers, Obstacles, and Hindrances

The data for these findings on barriers, obstacles, and hindrances to computer-supported collaborative learning were obtained from the lecturers during the interviews with them.

### 7.7.1 As identified by faculty members

#### 7.7.1.1 Faculty members and training

Faculty members mentioned some weaknesses that impede students' collaboration ability. For instance, it was admitted that *"some faculty members don't have enough skills, so they need training and intensive training courses, especially old[er] faculty members, as they don't quickly accept using technology"*. Another stated: *"You find that the old[er] generations of faculty members don't desire to use the technology; they don't like change, and they see that changes aren't important"* [Dr S3].

The above is a form of resistance because a teacher accustomed to traditional teaching *"wants to instruct the same way he learned"*. These teachers probably also need *"incentives"* to make them adopt new technology-based teaching methods for CSCL; such incentives are *"meaningful"*. In other

words, as another interviewee said: *“There may be no support or motivation to use the technology”*. Another faculty member highlighted the same issue, calling it *“the most significant barriers”*. In addition to leading to resistance, it also results in a *“lack of possibilities”*, and he attributed this to lack of qualifications and of CSCL training in using technology.

This highlights that the main underlying problem is related to training. The reason for inadequate experience in using CL tools or applying teaching methods for CL is the *“training factor”*. One member said: *“There are no training activities for faculty members on how to start collaborative learning or the group discussion, so we should pay great[er] attention to the training provided for faculty members and students”*.

The above may also explain why, for instance, faculty members are unable to devise suitable lessons that are *“valid for collaborative learning”*. The same faculty member mentioned that some teachers consider grouping students sufficient for them to collaborate, whereas *“the teacher should also supervise these groups and guide the student to the correct information”*. This suggests the teacher should not limit himself to simply arranging the CL session, but should also guide the students during the collaboration to ensure they are on *“the correct path”*. This evokes the traditional thinking on ways of teaching in which there is a ‘right’ or ‘correct’ approach and solution instead of making the outcome open to different possibilities according to the students’ research and collaborative learning experiences. It suggests that teachers are still clinging to traditional ideas on teaching and do not fully embrace constructivist approaches.

One solution pointed out was to have teachers *“trained by experienced trainers”* so that they become *“well-trained in [the] skills of collaborative learning”*. Furthermore, it was suggested that this training should include *“good observation”* skills to enable them to observe multiple groups simultaneously. In addition, in the case of CSCL, there is a need for specialised training, as *“nobody is specialised in education designing; nobody can make audio nor animation”*. The faculty member who pointed this out said that the university focuses instead *“on establishing the infrastructure”*, which he admits *“is very good”*, but for this lack of attention to giving much-needed specialised training.

Another solution could be following the example of others, but as one faculty member stated, *“We don’t have a learning model we can follow”*. Not only that but *“no one knows about the learning model that can work”*. Some teachers do not even allow students to form groups, as one pointed out, and *“additionally, the curriculum itself or the content doesn’t require collaborative learning”*, which he described as *“the greatest impediment to collaborative learning”*. This corroborates the earlier comment on some teachers not understanding or fully embracing CL. However, it is contradicted in

another response by the same teacher when he admitted that for CSCL “*there is some educational content that can be supported using these tools*”.

Time constraints are another common obstacle faced by teachers in the case of CSCL. As one interviewee said, even if the university provided training for the technology that it has already made available, “*it would be at the times and hours of faculty members teaching*”. He thus hinted at the lack of time available for undergoing training. One teacher also pointed out “*there is an overload*” on them. Although teachers have been given some technology provisions and the flexibility to use them for CSCL, not all are equipped with the skills to utilise them to support their teaching.

#### **7.7.1.2 Previous experience**

The lack of previous experience is apparent when some students do not participate. As one faculty staff member pointed out, “*You note that only one student speaks and others listen*”, and he, therefore, recommended that teachers get more involved in these cases and for those other students to be encouraged more.

#### **7.7.1.3 Tools**

In the case of CSCL, device availability or the lack of or having inappropriate tools are some of the greatest obstacles faced by students. Since not all students can use their own computer equipment at home, many of them rely on the devices provided by the university. According to one faculty member: “*The tools are one of the biggest obstacles in this regard... there will be a difficulty if the electronic equipment is not enough or lack [of] training for the instructor is what causes difficulty*”. Some rooms “*are unequipped for collaborative learning*”, or, as another said, “*it isn't enough*”, or there is an “*absence of equipped laboratories to use this technology*”. However, there was no lack of equipment for another, who said “*Of course, the university makes it available*”, and then turned to the issue of lack of specialised training.

There are also technical issues that can have an impact on teaching in the case of CSCL. Among the deficiencies of tools mentioned was lack of customisation and reports of “*technical problems*”, such as the “*failure of devices*”. Two teachers said the projector failed to work, and one mentioned the hall, which made him “*change the hall*”. These are large rooms or areas where computers are made available for use by students. This also includes problems such as slow or poor connection, which can “*impair the lesson*”, and disconnections from the internet altogether. There are, therefore, “*problems of computer maintenance*”. The type of tools provided for CSCL is also a factor. Blogs were an inappropriate tool for some. One was afraid “*that students may log into untrusted blogs*”,

despite being taught by the university how to assess and evaluate internet content for accuracy and reliability.

However, for CSCL, most mentioned “*social networking sites in general*” as an obstacle, which students cannot access while learning. They cause “*a distraction of ideas with overlaps with others*”. Above all, they cause “*confusion away from the page's goal*”. “*University-approved software*”, such as Blackboard, is recognised as “*more effective than social networking sites*”. This environment is “*more controlled for the instruction process*”, since the software is provided by the university specifically for learning management. It does not have any distractions on social media platforms.

On the other hand, another faculty member mentioned he experienced problems with “*technical editions of the Blackboard*”, so specialised tools do not necessarily guarantee greater reliability. Therefore, it is not so much about a device being unsuitable, but that “*there is unsuitable use*” of those tools, i.e., they are used inappropriately. The same faculty member added that “*right uses, and other incorrect uses – this depends on the teacher or the educational designer*”. By this, he meant having appropriate subjects, provision of training programmes, a “*learning model*” to follow, “*meaningful incentives*” given to students, and educational designers capable of making audio and animation in the case of CSCL. He did not elaborate further on right and wrong uses except for emphasising tools over suitability.

#### **7.7.1.4 Student-related reasons**

One faculty member pointed out the problems of “*shyness, carelessness, learning difficulties, getting bored, and lack of enthusiasm*” among students, leading to “*individual differences*”. Boredom and lack of enthusiasm, for instance, set in due to “*repetition*” and “*inappropriate subjects*”. In addition, some students just “*do not like to integrate with the group; they do not have much interest in the subject of the lecture*”. Another highlighted:

...shyness may be one of the main reasons facing Arab societies in general, and thus through collaborative learning we provide the opportunity for students to overcome this barrier, and overcome this matter, and therefore maybe among the main obstacles is that the process of students not adapting since they were young to [avoid] confrontation with others. [Dr K]

Based on the original response in Arabic, the interviewee meant that shyness is ingrained in Arab culture. Since they were young, the students have had this tendency, and they are especially reluctant to engage in any interaction that could lead to confrontation. This is a real fear. As another interviewee experienced:

We had very many problems in motivating the student to talk even. The students did not have the desire or the courage to speak and present his ideas for fear that his information would be wrong, so his colleagues could make fun of him. This is the main problem of motivating the student about how to speak and express himself. [Dr K]

Notably, these issues would be more common in synchronous CL arrangements in CSCL rather than asynchronous CL arrangements, which could lessen the pressure and, therefore, be less problematic for shyer students. Teachers also face “*resistance by students, as they want to finish [the session] quickly*”. Such students “*aren’t serious regarding learning... aren’t interested in, or [are] afraid of collaborative learning*”. Even students who engage actively in CL may lack experience in using the tools, which indicates that training is equally valuable and needed for students as it is for teachers. There may also be a problem with “*communication with others*” or “*miscommunication between students*”, although this can be avoided “*through good grouping*”. Related to tools is the issue of some students being “*poor*” at using them.

### **7.7.2 Barriers for students**

The data for the following findings on barriers for students to computer-supported collaborative learning were obtained from the students themselves during the focus group sessions with them.

#### **7.7.2.1 Feelings and attitudes of students**

With regard to the responses of students to explain the issue of shyness highlighted by teachers, one group member remarked:

Shyness isn’t the thing that hinders collaborative learning, as you interact with your friends, but the limited time and malfunctions in some computers may make students unable to respond. Also, some persons aren’t cooperative, as you can discuss with them, but they don’t accept your opinion. [FG1]

The blame is thus put on the equipment and other prohibitive physical and social arrangements as causes of students being “*unable to respond*”. However, another student within the same focus group admitted that despite students having “*a sea of information... they are ashamed to provide it, or they may be reluctant to feel that they have a wrong answer*”, which corroborates what one of the teachers reported. Another student who agreed that shyness is a problem explained that “*fear and shyness make the student afraid to provide a wrong answer and then [have the others] make fun of him*”. He also added stress and carelessness given that “*Some students say that they don’t want to participate and only record my name to get the score*”.

Fear was also mentioned in another focus group and again linked to being wrong and friends making “*fun of you*”. However, students’ shyness is also attributed to students not being “*open to each other,*

*or if they were new or from another region*". In the same group, another student mentioned an *"absence of self-confidence"*, which makes a student unable to *"depend on himself or deduce any idea"*. Other personal reasons mentioned are a distraction from thinking about external things and playing, but the causes are personal. As mentioned earlier, it is also due to poor cooperation. For this, the student recommended making groups so that *"students will be more developed"*; that is, in terms of experience, learning, and knowledge.

As highlighted earlier for older faculty members, some students *"see that the traditional method is better"*. There are thus *"inconsistent views"* among students towards collaborative learning. One student claimed there is also an issue of *"pride and ethics"*, for which some students are reluctant to participate or are simply absent. The pride is in not answering wrongly, and thus being seen as a weak student in front of others, and he used 'ethics' to describe the situation of potential disagreements, being mocked, and being *"outperform[ed]"*.

#### **7.7.2.2 Knowledge, skills, and experience**

Some students reported having difficulty using the computer in the case of CSCL. For instance, one student said: *"He may have information more than us, but he cannot use the computer"*. Another related response was, *"When the student uses it only outside the university, he may forget the method of using it inside the university"*. He meant that they are accustomed to using social media tools outside their learning routine but are unable to utilise the same for learning purposes. There are further issues for students who can use a computer, which is likely to be most of them, such as trusting the source of information, and *"He doesn't try to seek the truth"*. Some students have experienced *"adverse health effects"* due to *"prolonged sitting at the computer"* in the case of CSCL.

#### **7.7.2.3 Teachers, environment, and tools**

Some students felt there is insufficient guidance from the teachers during the collaboration, which corroborates what one of the teachers said. It was revealed that *"The professor explains and leaves without participating"*. One student in another focus group described receiving *"no assistance at the educational environment"*. He referred to the physical spaces at the university where learning takes place. One student mentioned that the environment itself is *"unsuitable... for cooperative learning"*, and, in the same focus group, *"some halls don't allow for that"*. For those students who rely on the computers provided at their university for CSCL, they pointed out lacking these provisions as far as using them for CL is concerned.

Similar problems were identified regarding CSCL tools as were identified by the teachers. These problems include slow internet, which makes “*you get the information late*”, and “*malfunctions in computers*”. These are all classified as “*technical failures*”. This is when computers and the internet are available because their “*unavailability*” is also an issue, as there are “*no computers in some halls*” and “*some students can’t get a new device*”. In addition, some of the computer rooms and areas are poorly equipped to support CSCL, but the students who rely on them are mostly not in a financial position to purchase their own.

Summaries of the findings presented in this subsection are shown in Tables 27 and 28.

**Table 27: Summary of findings on data gathered on challenges of CL**

<b>Finding</b>	<b>Applies to CL, TCL, or CSCL?</b>
<b>Institutional and General Support</b>	
Deficient/inadequate support	CSCL
Unsuitable curricula/lessons/guidance	CL
Unsuitable environment	CL
Lack of resources	CSCL
<b>Tools and Devices</b>	
Lack/unavailability of tools/equipment/computers	CSCL
Network issues (poor/slow)	CSCL
Unsuitable/deficient tools/not customisable /malfunctioning/damaged	CSCL
Distractions	CL
<b>Teacher Related</b>	
Lack of teacher training/skills	CSCL
Too much workload/lack of time	CL
Lack of experience	CSCL
Lack of interest/incentives	CL
<b>Student Related</b>	
Learning deficiencies/difficulties	CSCL
Lack of computer proficiency	CSCL
Lack of interest/demotivation/unwilling/inactive	CL
Personal psychological issues (lack of confidence, shyness, fear, health, etc.)	CL
Miscommunication among students	CL
Resistance to change/trying new methods	CSCL
Lack of attention	CL
Personal moral issues (credibility, pride, ethics, etc.)	CL
Not convinced/prefer non-CL methods	CL

**Table 28: Frequency analysis of the emergent theme of Challenges**

Theme	Sub-Theme	Example	Frequency
Challenges	Institutional/Training	No support or motivation to use technology.	2
	Curricula	Curriculum doesn't require CL.	3
	Teacher related	Professor leaves without providing any participation.	4
	Resources	Not enough electronic equipment.	2
	Tools/Devices	Technical problems.	4
	Student related	Miscommunication between students.	1
	Knowledge/Skills	Difficulty using the computer.	4

## 7.8 Provision, Support, and Receptiveness

The data for these findings on provision, support, and receptiveness were obtained from the lecturers during the interviews.

### 7.8.1 Strengths in provision and support

One interviewee stated confidently that the university “*provides everything 100%*”, and others replied affirmatively by saying “*Yes*” when asked about it or “*Yes, the university provides us everything we need*”. Others specified what was available to them for CSCL specifically: “*Educational resources and means are available*” [Dr S1].

From my point of view, I find it available to some extent. The software is sufficient, the internal internet is sufficient, with computer laboratories through which the system can be activated in the discussion sessions or others. So, I think the tools are available. But... [see institutional support under shortcomings below].  
[Dr K]

A few suggested how the provisions should be made. For instance, one said, “*The computer-supported one and the traditional one would be better inside the study rooms. But the computer-supported one could support outside the study rooms*”.

### 7.8.2 Shortcomings in provision and support

Shortcomings or deficiencies in the university’s provision and support for collaborative learning are detailed below.

Computers and internet for CSCL:

- Desktops/internet not available on Fridays and Saturdays due to maintenance
- No university-provided laptops

**Training and other institutional support for CSCL:**

It completely makes it available, but it lacks training and qualification. [Dr Sh]

It remains to provide training for faculty members and qualify them to deal with this tool professionally. [Dr Sh]

But lacking is the idea of implementation controls and mechanisms of implementation as well as the implementation of these methods and evaluation of them, and when all this will be a 100% activation. [Dr K]

**On the part of teachers:**

Some teachers... present the lecture and leave... don't care about the students' understanding. But if he was instructed and the academic staff at universities were kept aware, we can reach an advanced level in using collaborative learning. [Dr S1]

Given the above shortcomings, one interviewee also pointed out that *“if there are unavailable things, we can ask for it and get it available”*. Another recommended implementing the team arrangement *“in entrepreneurship... where they feel that they are the managers themselves, and feel these... are owned by them, and that they are a team in a company”*. A third mentioned having *“a strategy of modern strategies”*, by which he meant *“modern methods of education”*.

**Table 29: Frequency analysis of the emergent theme of Provision**

Theme	Sub-Theme	Example	Frequency
Provision	Strengths	The software is sufficient.	3
	Shortcomings	Computers/internet not available on Fridays and Saturdays.	3

**7.9 Facilitation of Collaborative Learning**

The data for these findings on the facilitation of collaborative learning were obtained from the lecturers during the interviews with them.

**7.9.1 On the part of the university**

Several teachers emphasised the provision of training. In the view of one teacher, *“good training for the teacher”* is *“the first thing”*, which for CSCL other teachers specified as *“knowledge about the technology”*, *“how to deal with computers and collaboration with forums”*, and how to *“motivate students to participate with them”*. Another said, *“The training role also has an important role”* and this should be *“provided by the university as a training course”*, as it could help *“make using educational forums easier”*. Others recommended *“the trainer should have many training courses, as*

*not every faculty member can provide collaborative learning*"; another, in the case of CSCL, for it to be *"summarised"* by which he meant short videos *"of 5 minutes at the most or just a quick video"*. Finally, another recommended *"workshops on electronic platforms that provide simulation models and seminars that allow direct communication with the teacher"*.

The availability of devices is another important factor in the case of CSCL, which *"means a lot"* and includes the availability of the network and internet, which *"significantly helps"*. The same teacher also mentioned the need for *"encouragement by the university"* besides *"holding training courses... for using computer-supported items"*. Another referred to computers specifically for CSCL and noted that the university *"provide[s] modern laptops with high-speed internet for faculty members"*, and another also mentioned *"data show projector, [and] smart hardware"* to be made available. Importantly, the faculty members should not have *"to buy any device and enter it to the university"*. Additionally, *"inspiring stories in success to help teachers"* could also serve the same purpose of encouraging teachers.

As well as devices, the tools provided on them are also important, which *"should be clear and available for the teacher not to be a burden on him"*. Hence, as another said, the most effective tool supports interaction and discussion. According to one interviewee, *"Educational forums are the best where there is discussion supporting CSCL"*. Another described the ideal tool in general terms: *"The most effective tools are those used inside the classroom because... the environment is disciplined"*, whereas this is difficult to control outside.

As for a specific type of tool in the case of CSCL, it was reported to be the forum that is *"one of the most effective asynchronous tool[s] in collaborative learning"*, which involves discussions and can do away with the *"need [for] face-to-face interaction"*. This view was shared by another, who identified the same and audio/video dialogue as *"the most effective synchronous tool"* for CSCL, but, as another stated, *"Learning does not necessarily have to be synchronised"*. One who mentioned videoconferencing said, *"It is considered distinctive, as the teacher would be present with his students at the same time where students are in their places"*. Other than the forum, the *"wiki is better, as it is specialised for the educational field"*, in the view of a few interviewees who also contrasted it with social media tools that *"are specialised for social contact"* despite the greater interest of students in them.

However, one of the interviewees admitted that for CSCL, *"concerning interaction, social media is more significant"*, and another recommended only Facebook *"for learning, as it has many options"*. Thus, *"a package of tools"* was also recommended by another that can be used *"every time in [a]*

*different way*". Notably, one said, *"one of the best programmes is [a] virtual learning environment"*, specifically Second Life, *"as it makes direct communication available... in a collaborative manner"*.

In short, *"The method should be easy... where it is easily accessible, and they can write information and send it easily without barriers"*, and the devices *"should be modern... easily accessible... easy"*, such that they lead to *"time and effort saving"*. As one interviewee stated, the objective is, therefore, *"to save time and effort"* by ensuring the devices in the case of CSCL are simple and effective. Also, the website *"should motivate you to write"*. Along with the devices and tools, it is necessary to also provide *"full technical support on standby"*.

Also important is a *"supportive environment"*. This was emphasised by another teacher, who described it as having *"a great role"* and to which he added *"tables and chairs... well-designed... lights, air conditioners and student numbers... [as other] important factors"*. He also recommended cabinets for students, limiting the groups to no more than 3-4, and the students to no more than 15, allowing students to have breaks for drinks *"to motivate them, especially for lectures of 2 hours and more... [and] keeping the study room clean"*. Finally, another combined several related factors in stating:

The learning environment must be adapted in terms of the number of students, in terms of equipment in the classroom and terms of access to knowledge or information. It is an integrated process. [Dr J from an observed CSCL class]

Another interviewee recommended that the environment be adaptive but did not use this term and described being able to *"change it at any time to be an excellent environment for collaborative learning"*. As another said, this means that in order *"to provide the learning environment, the teacher must be familiar with the matter to deal with the group of students"*. Another aspect desired by another teacher was to have the room and lab set up in the case of CSCL *"to use on the internet in real time"*.

## **7.9.2 On the part of the teacher**

### **7.9.2.1 Before collaboration**

First and foremost, what *"makes collaborative learning easier... is the teacher's belief in collaborative learning"*. Another interesting reply was *"the professor's personality who presents the lesson at first"*. Also, to begin with, teachers *"should have a skill and experience to view previous literature and research constraints"* and should also be counselled, especially on *"the barriers to its use"* or the obstacles to be overcome, which are *"prevalent in previous studies on the same wiki"*. One claimed that *"previous experience in managing discussions"* can specifically lead to *"more interaction"* among students, which would then *"achieve the objective of collaborative learning"*.

Another who justified the need for improved skills pointed out that “*Skills play an important role, especially as there are some faculty members without skills, and their skills are improved through training courses and intensive training*” [Dr F from an observed TCL class].

As one teacher commented about students, sometimes “*they don't understand the topic*”, so another important requirement is the “*clarity of the teaching method*” because if this is clear, then “*the image will be clear*”. This means having tasks clarified, such as “*what they are required to achieve within the group at the end of the lesson*”, that is:

To have a specific goal before the start of the educational process, and before the start of the lesson through the preparation of the scientific material; how to communicate the information, the distribution of roles within the groups themselves, receiving students' answers, guiding students – all of these are very important during the collaborative learning process, and it is important to identify the key steps in this. [Dr K]

Moreover, as another put it, “*identifying activities and roles... helps prevent any kind of chaos*”. For this purpose, another teacher recommended having “*small objectives*” by dividing the main objective. According to another, students should be given “*multi-tasks with an identified period*”. As well as tasks, the “*roles of students in the educational activity*” also need clarifying.

As for grouping, this was described by one interviewee as the ability to “*break the routine... and... get new experiences*”, particularly to find “*answers*”, as the group “*would be faster in getting information*”. According to another teacher, grouping should be arranged so that “*every team member has a role to perform*”. Furthermore, “*groups [should] be balanced, not randomly assembled*”. Another interviewee also mentioned the need “*to avoid random grouping*” and suggested that grouping should instead be on the basis “*of the academic level of students... with a good level with other low levels to benefit from each other*”. In other words, he advocated for mixed-ability grouping. Another interviewee explained that “*If groups are **heterogeneous**, this would facilitate collaborative learning. This means that these groups include excellent students and lower-level students*” [Dr Y].

To achieve this, one of the teachers recommended changing the students so that “*they will take benefit*”, which he believed would not be possible with a fixed group. However, the advice of mixed grouping is contradicted by one teacher who advised having homogeneous groups instead, hence the highlighting in bold to emphasise this contrast in the responses. In addition to providing “*a suitable learning environment*”, he stressed: “*Students must be at the same level, and there is no disparity in scientific capabilities between students to be fairly close and **homogeneous** and must be the guidance of the teacher or professor who [is] supervising them*” [Dr K].

The above findings indicate the need for organisation in the case of CSCL because, in one teacher's experience, *"The more the computer-supported performance is arranged, the more excellent it will be in collaborative learning"*, especially to *"decrease the distraction of students"*. As part of this arrangement, one recommended having small groups, which another justified based on being *"more wonderful, and would help more... the strongest thing"*. According to one, the size should be restricted to a small group of *"five or six individuals"*, but for another, it *"shouldn't be more than 12 students"*. Another stated 15 but added similarly important aspects of the arrangement, namely room size, *"including its utilities"*, and colours that *"attract the attention of the student"*, for instance through having *"posters on walls throughout the semester"*. To these, he mentioned equipment, such as clocks and projectors, *"that the faculty member should have... [as] all of this has a significant role"*. He also suggested that *"the trainer should have positive attributes"* in the way he dresses.

According to another teacher, the teacher's focus as a trainer should also be on enabling students to *"make a full discussion with groups, motivate them, and clarify some matters when asking about something they didn't know"*. This could also come about by the teacher himself setting *"learning standards... [for] use in education"*. In short, *"It should be planned for... outputs, activities, time, and tools before starting to learn"*. Another interviewee described this *"as a strategy... [to] save the teacher's time"*, in which the CL is arranged in *"an organised and planned manner"*.

In terms of materials, the teacher facilitates CL among students by giving *"them some materials and questions that make them work as a team"*. According to another teacher, the use of Blackboard in CSCL with *"approved materials within the course of the information network... shows a lot in delivering scientific material to students"*. That is, he considers it to be especially suitable for scientific materials. Importantly, this raises the suitability of materials or subjects appropriate for collaborative learning.

The method of instruction or learning is also important for some interviewees. One emphasised *"the diversification of learning methods and paying attention to the diversification of learning methods"*. This links with identifying and clarifying objectives, which is part of the *"pre-preparation for the lesson"*. In the case of a video conference, this means *"coordination before the video"*. One student advised that students *"be included in the educational method: to be a part of it"*.

### **7.9.2.2 While collaborating**

While the students collaborate, lecturer intervention is necessary because *"they will learn only through your guidance"*. Another described the same as *"indirect interference of the teacher, leader"*

*or instructor*” in case “*some students need to inquire about something*”. As another put it, instead of giving students information directly, the teacher “*should give them the chance to search or deal with each other to get the information*”. Therefore, in terms of supervision during collaboration, it may be necessary “*to guide students, clarify ideas and objectives, encourage students, and help any students [who] require more effort than others*”. As another described it, this monitoring is necessary “*to detect where they would reach*”. One teacher emphasised this need in the following words: “*If I cannot control and guide my students, there is no need to use the method of collaborative learning, as this method will show the ability of the teacher to guide students, distribute their ideas and direct their ideas*” [Dr K].

This above lecturer’s view suggests he considers the teacher’s ability to guide his students as essential for making CL successful while also providing an opportunity for the teacher to demonstrate his ability to teach and convey his ideas. One teacher said, “*Encouraging students is a very important thing*”, for which another added, referring to CSCL, “*to use the computer and try the audio-discussion or the chatting that is usable on time*”; “*The teacher has an important role in the educational process [to] motivate students and encourage them to participate actively*”. The students need the teacher “*to develop incentives for them*”, in the words of another interviewee. One way to “*motivate them [is] by asking explanatory questions*”.

One interviewee affirmed he also has competition between the students and that this “*would be the trainer’s responsibility*”. In the opinion of another, a competitive atmosphere is required “*without which the quality would reduce*”, and to ensure an “*exchange of view[s]*” takes place, which another said should be made “*freely... [without being] afraid of accountability when making mistakes*”. The same added that since learning is now recorded in the case of CSCL, teachers give students “*the opportunity to make a mistake and to fix it*”, or, as another put it, to modify information.

### **7.9.2.3 After collaboration**

It is not only during and after collaboration that the teacher has an important role. As one teacher said, “*The trainer plays the full role inside the room starting from the theoretical aspect of the distribution of roles to implement feedback to evaluate the educational outputs*”. Another suggested “*feedback by audio and video*”, which is possible under CSCL, and giving an “*evaluation form for groups’ performance*”. Finally, one interviewee recommended “*open discussion sessions, and submit[ting] assessments or reports on these sessions... and follow-up by the evaluators*”.

### **7.9.3 On the part of the students**

#### **7.9.3.1 Before collaboration**

Students need to have “*enough information*” to become “*more familiar with the website, educational forum, wiki*” in the case of CSCL. This better described what another said about students needing “*clarity of the image*”. One stressed the “*need of students... using these tools in a good way*”, such that they can learn to use them quickly. Another teacher said that for CSCL “*Students should be provided with a training course or a lecture showing them the method of using collaborative learning through forums*”, based on finding that “*students were not having a clear image of using collaborative learning*”. Only “*after providing the lecture, we got a significant and clear positivity from students*”. Another explained that the trainer needs “*to understand some topics and motivate them*”.

This motivation, according to one, requires “*instilling the spirit of collaboration between students and developing students’ skills*”. Then, according to another, teachers “*should allow them to select their leader first*”. Finally, one interviewee identified several ‘steps’ worth noting, which are to teach typing, encourage students, and give them self-confidence:

the first step is... [to] teach typing to students. It is very important and necessary, especially in advanced stages... The second step would be encouraging students to use the computer... The third step is to provide the student with self-confidence via the computer when asking or at discussion... I think these are the most important things that [the] teacher should provide to enhance the learning process. [Dr Y]

#### **7.9.3.2 While collaborating**

During the collaboration itself, “*The role of supervisors and teachers... is very important for a student who is of course in need of guidance*”. It is necessary, for example, to ensure responses are clear and that there is sufficient interaction between the students. In this, interest and communication are essential, as one pointed out “*The most significant element is effective communication [because] the more the students can communicate and interact, the easier the process. Being interested is also a significant element. If the student is interested in the educational subject, he will share and interact with others*”. [Dr S3]

One teacher highlighted that in the case of CSCL audio discussions “*would be embarrassing for female students, so typing is important*”; otherwise, “*the rest of the forums are important*”.

Summaries of the findings presented in this subsection are shown in Tables 30 and 31.

**Table 30: Summary of findings on data gathered on facilitators of CL**

<b>Finding</b>	<b>Applies to CL, TCL or CSCL?</b>
<b>Teacher Related</b>	
Teachers' skills and experiences in managing discussions	CL
Teachers' personal attributes (beliefs, personality, and dress)	CL
Teachers' knowledge of the technology and topic	CSCL
<b>Training and Counselling</b>	
Provision of trainers/training	CL
Teacher training to motivate students	CL
Teacher training on using computers	CSCL
Teacher training on making students collaborate and engage in discussions	CL
Training students to be motivated	CL
Training students in using devices and tools	CL
Typing skills for students	CSCL
Arrangement of workshops	CL
Student counselling to deal with challenges/teacher mentoring	CL
<b>Equipment, Tools, and Resources</b>	
Provision of other devices (projector, smartboards)	CL
Suitable learning materials and resources	CL
Short videos	CL
Provision of tools to support CL (computer hardware, software, web-based tools, in class)	CSCL
Adequacy of CL tools (new, easy to use, effective, supportive of interaction/discussion)	CL, esp. CSCL
Availability of computer labs	CSCL
Internet access (sufficient speed, reliable)	CSCL
Technical support	CL, esp. CSCL
Well-designed classroom furniture	CL
Provision of cabinets for students	CL
<b>Environment, Grouping, and Tasks</b>	
Supportive environment (clean, air conditioned)	CL
Supportive classrooms (right size, equipped)	CL
Arranging students in groups with individual roles	CL
Organising small/few groups	CL
Task assignment (individual roles, clear/specific goals, multi-tasks)	CL
Organisation (objectives, coordination)	CL
Arranging balanced groups	CL
Teaching methods (clarity)	CL
Competitive atmosphere	CL
Appropriate displays (coloured, lighting, posters)	CL
<b>Encouragement, Guidance, and Information</b>	
Encouragement/motivation/incentives by the teacher	CL
Monitoring/supervising students/ensuring interaction	CL
Control and guidance	CL
Strategic planning	CL
Lecturer intervention	CL

<b>Finding</b>	<b>Applies to CL, TCL or CSCL?</b>
The information imparted to students (clear, comprehensible)	CL
Ability to modify/adapt the information	CL
Encouragement/incentives from the university	CL
Inspirational stories for motivating students	CL
Instilling a spirit of collaboration	CL
Opportunities for students to ask/fix things	CL
<b>Learning, Reporting, and Feedback</b>	
Giving students feedback	CL
Evaluation (follow-up, performance)	CL
Adopting learning standards	CL
Learning methods (including students, diversity)	CL
Doing homework through peer learning	CL
Report-making	CL

**Table 31: Frequency analysis of the emergent theme of Facilitators**

<b>Theme</b>	<b>Sub-Theme</b>	<b>Example</b>	<b>Frequency</b>
Facilitators	University	Incentives for students	6
	Teacher training	Holding training courses	10
	Teachers' skills/attributes	Need to provide simulation models and seminars	3
	Equipment/furniture	Cabinets for students	1
	Devices/tools	Forums are best when there are discussions	8
	Resources/support	A supportive environment is important	7
	Tasks/roles	Balanced group	3
	Information/planning	Information imparted to students	4
	Encouragement/motivation	Encouragement to participate	15
	Guidance/supervision	Supervisors for students	3
	Learning	Involving students in the method	3
	Reporting/feedback	Performance evaluation	2

## 7.10 Future Outlook

This subsection of the findings reports on comments indicating a future outlook for collaborative learning at Hail University and in Saudi Arabia in general, in the view of the interviewees.

### 7.10.1 Prospects for collaborative learning at the university

This subsection presents the prospects for collaborative learning at the university in which this study took place. One interviewee expressed the *“hope that there will be a continuation”*. Another predicted: *“I expect the Deanship of Quality or Information Technology”*. Another was optimistic in saying: *“At the University of Hail, I think there is a tendency to implement it in the future, but there is a need for some time”*. Teachers are also willing to make this a reality because, as one said: *“I wish to apply this method to provide information faster and easier than the traditional method”*.

One teacher commented on students, in that *“Some students may be interested in learning through technology more than [in] traditional ways that may motivate students to learn”*. Another highlighted the situation of the low academic level of students at Hail in which collaborative learning could play a role in improving matters by allowing mixed-ability groups to interact:

Students coming from schools have a very low level. This is applied in the Hail region... Students came to us at a very low level. In that case, we can't blame the student due to the problems of public education that we all know. However, some of the good students came to us. If we included these good students with others at a low level, we could improve the level of our students. [Dr S1]

Similarly, another interviewee recommended adopting collaborative learning as *“a strategy”*, which he said would *“save the teacher's time, and you will help in students' integration”*. The following response is reproduced in full because it highlights several needs for collaborative learning (to motivate, express abilities, overcome shyness) and justifies why it should be encouraged:

From my point of view, I think it is a very important requirement in the educational process now because we, through our experiences with the students of the preparatory year, face a very big problem in the process of urging the student to motivate him to bring out his information and abilities. Thus, when you ask students to express their ideas, they are very shy about confrontation. Here comes the role of the collaborative learning process where it allows the student to express himself through interaction with a group of peers close to his ideas and age. This will certainly greatly support him in the learning process, and I see that it is a basic or very important requirement during the coming period. We should encourage the application of collaborative learning at all levels of education in general. [Dr K]

## **7.10.2 Outlook for collaborative learning in Saudi Arabia**

### **7.10.2.1 Generally positive outlooks**

Four responses were noted by those who projected a generally positive or optimistic outlook for collaborative learning in Saudi Arabia. One expected that *“It will expand”*, and another agreed *“that collaborative learning will be applied in the future”*. A third interviewee projected it would lead to social cohesion, the breaking of introversion and psychological barriers, and to the acquisition of skills by students. A fourth foresees a new generation with *“high”* communication skills that will make building knowledge easier and thereby provide good learning opportunities: *“It will help spread the principle of social [cohesion], as some people here are not social. Some students will acquire skills to build relationships and social networks by breaking introversion barriers and the psychological barrier”* [Dr S2]. Another felt that *“our youth are dynamic. It is a new generation with high communication skills. So, it becomes easy for them to build knowledge together, and so forth. This gives a good opportunity in learning”*. [Dr O]

None of the interviewees projected a negative outlook for collaborative learning in Saudi Arabia. However, one was adamant in expressing this certainty and described the technology as *“an extension of your body”*:

The phrase decrease doesn't exist. It is a digital generation. Technology has become an extension of your body... so don't say that it will decrease. No, it will be used more. It will not be subject to teacher opinion, like many things that you are forced to use, not by the country or by the subject but the learner community will force you to use these methods or tools. [Dr O]

### **7.10.2.2 Significantly positive outlooks**

Three responses were noted by those who projected a significantly positive or optimistic outlook for collaborative learning in Saudi Arabia. Therefore, it is believed that collaborative learning will expand ‘significantly’. One simply said, *“I expect that it will achieve a significant success to achieve collaborative learning objectives”*, while the other two elaborated further:

Given the significant interest paid to the technology, I expect that there would be a future vision by the Ministry of Education or universities, which will significantly depend on collaborative learning. Faculty members will be trained on new programs and tools to activate collaborative learning significantly. [Dr S3]

I think it will significantly expand; especially the future of education is the future of collaborative learning and e-learning using these tools. When the student is left alone with the computer, this will open many fields for him on the internet. He will establish new knowledge, skills, and information provided through the forum. The student will also feel confident and positive. He will get new information and experiences from other students. I think that it should expand at all Saudi universities. Also, to achieve Saudi Vision 2030, there should be e-transformation, especially within the education field. [Dr Y]

The second response above foresees significant interest in educational technology and a vision of greater reliance on collaborative learning. The third response considers collaborative learning as “*the future of education*”. The interviewee who gave the latter answer believes it would establish new knowledge and skills, greater confidence and positivity, and is necessary as part of an overall e-transformation to achieve Saudi Vision 2030.

### 7.10.2.3 Main drivers of change

Several responses projected an optimistic outlook for collaborative learning in Saudi Arabia and identified the main drivers of change as “*digital transformation*” or the kingdom’s Vision 2030. One respondent acknowledged the “*necessary*” role of computers in this transformation:

Now, the computer has become a necessary technology. The Ministry of Education is currently interested in using technology in digital transformation programmes. Now, universities force faculty members to use the Blackboard effectively... This means that the technology will surely come, supported by Vision 2030. [Dr S3]

Importantly, this digital transformation not only incorporates “*e-learning and e-transformation*”, as one interviewee put it, but has a much wider scope for Saudi Arabia’s economic development: “*The kingdom’s Vision 2030 was a significant driver in the kingdom. It saved tools and provided support, opportunities, and [is] a big umbrella for development.*” [Dr O]

Again, importantly, universities can play a key role in bringing about the Vision:

Due to technology development, the university should tend to it through Vision 2030 that promotes the development and keeps pace with new technologies... so Vision 2030 supports this and serves them to update technologies and use all e-devices. Thankfully, the Vision 2030 has a significant role. Since 2016, Vision 2030 is being applied and updated. [Dr F]

This includes the students in those universities: “*As it allows the student to be included and view his opinion. The kingdom’s Vision 2030 also helps achieve these objectives (i.e., digital transformation, etc.)*” [Dr N].

Two respondents specifically mentioned collaborative learning. It shows that Vision 2030 is playing a key role in supporting collaborative learning: “*The society is social in the KSA, so I think that collaborative learning would spread further. Also, the KSA trend to digital transformation and supporting technology would make it more prevalent*” [Dr A].

It is clear that by looking at the kingdom’s novel 2030 and through the programmes we have heard through forums and meetings with university and education leaders, there is a clear trend to expand collaborative learning using electronic tools, distance learning, and activating activities. [Dr J]

One further respondent foresaw significantly increased use of not just collaborative learning, but specifically CSCL in the kingdom: *“Undoubtedly, it will expand, and this is the modern trend of the Vision 2030. Computer-supported collaborative learning will grow significantly. Also, digital transformation is one of the things that [would] help and achieve objectives in the future”* [Dr A].

For another professor, the outlook for collaborative learning is itself dependent on Vision 2030 due to the need for support from decision makers, financial aid, and infrastructure:

From my point of view, I think that depends on the vision of the kingdom’s Vision 2030, as well as the decision makers in this matter because they have the decision to increase financial support, to raise the efficiency of tools and equipment and the supply of infrastructure for universities and educational institutions to be able to provide this service. [Dr K]

Other regional and global drivers of change were also identified. These outlooks are more global in scope: *“Because collaborative learning is implemented in the largest universities in the world, and therefore we in the Arab countries, and we replicate and duplicate what the international universities do”* [Dr S2].

In the past, we heard about groups inside the class, but now there are groups worldwide. There are international communities in which students participate in cooperative education... So, there is a future for digital transformation. Collaborative learning is a part of this digital transformation. [Dr O]

#### **7.10.2.4 Mixed or uncertain outlooks**

The following are the responses of those who were unsure or projected a mixed or a particular outlook for collaborative learning in Saudi Arabia:

If the academic bodies at universities were motivated, collaborative learning may be deployed. This would happen if it were correctly marketed and if its advantages were disseminated properly. [Dr S1].

Saudi universities tend to keep with the technology and new developments. Some universities have these new technologies, but it doesn’t use them as a new university. However, most Saudi universities tend to expand in using it. [Dr F]

As it produces a real experiment... suppose there is an experiment between traditional education and collaborative learning, and there are measures for the impact of tests on brainstorming. In that case, we may find that collaborative learning will be a great addition to the educational process. [Dr S3]

**Table 32: Frequency analysis of the emergent theme of Future Outlook**

Theme	Sub-Theme	Example	Frequency
Future Outlook	Prospects at university	CL can help low-achieving students.	5
	Outlook in the KSA	A new generation with high communication skills.	4
	Change drivers	Saudi Vision 2030	13

### 7.11 Interesting Remarks

Several remarks were noted for being especially interesting or unusual. For example, when identifying the benefits of collaborative learning, one teacher remarked:

This provides me with something that we didn't wean on as Arab people, which is fair competition. We have one person only who becomes the first, and others are equals. So, the competition became difficult. But now, with the presence of teamwork, all are winners. This is one of the gainful things in collaborative education. It gives everybody a chance to exist. [Dr O]

A quality of Arab culture is also apparent from the following remarks about collaborative learning tools:

We have a popular saying, "A good carpenter doesn't blame his tools", let alone having a computer, I can do many things even possibilities don't exist. The teacher can, through his creative thinking, change tools. Tools are easy. I can define its uses. The pen has various uses. The paper has various uses... therefore, I can select activities suiting collaborative learning. [Dr O]

One interviewee described technology as an appendage: "*Technology has become an extension of your body*". Another assured the researcher he was speaking to a specialist: "*To some extent... there is good work, even we all have everything, and this is enough, and there would be more than this. You are speaking to one specialized in education technology. It is my specialization*" [Dr O].

Finally, the following remark may serve as a closing word of encouragement and hope for collaborative learning in the Kingdom of Saudi Arabia:

I wish you success to God Almighty and that the process of collaborative learning using computer learning strategies is applied at the level of the kingdom in particular and the level of Arab countries in general, so that we can upgrade the capabilities of our students so that they can face the challenges of the current era. [Dr K]

### 7.12 Key Findings

The key findings of this research are presented in this section. The study focused on the Saudi context and had the aim of identifying original findings that emerged from the data. The study also considered

expected findings, such as CL being perceived as easy and flexible to use. The term ‘original’ refers to findings that were not found in the literature reviewed, although this does not rule out the possibility of their being discovered through further research. A mind map of the findings is presented in Figure 19 in Appendix F, which includes the opportunities and challenges identified. Figure 20 illustrates the facilitators of CL that were identified. The following original findings are particularly noteworthy due to their potential positive impact on learning: CL enhances student attention in class, broadens their horizons and perspectives, fosters idea generation, aids in remembering information, and facilitates collaborative learning.

### **7.12.1 Attention or focus**

A few findings deserve additional explanation because they conflict with other findings in this study. One of these is that CL makes students more attentive or focused, which contradicts the finding that, during CL, students tend to be distracted or less attentive. A key difference between these findings is the source. Students themselves claimed they were more focused during CL, but the researcher observed distractions in three of the four observed classes in the form of side-talking and the hidden use of mobile phones. The exception was Dr A2’s CSCL class, in which the teacher appeared to exercise better control and created an “*excellent*” supportive environment. In 7.6.1.6, it was noted that CL, in the words of a participant, “*eliminates shyness and inattention*” and “*attracts the attention of the student*”; and in 7.5.2.2, it was mentioned that one student thinks “*he has to pay attention*” under collaborative learning.

However, some teachers shared the same perception. For example, one teacher thinks CL made all his students “*remain attentive and very attracted, as their brains are stimulated*”. He also attributed it to the competitive atmosphere and students striving to obtain “*the highest learning degree*”. It appears that the participants, both teachers and students alike, projected an optimistic perspective of what CL can potentially do instead of reflecting the reality on the ground at their university. Although one teacher successfully prevented distraction in his class, the distractions observed by the researcher are evidence that all students do not, in practice, realise greater focus or attention. It could be that something more is required beside the classroom environment to engage, motivate, and support students to remain attentive, and some lessons could also be learned from Dr A2’s class.

Unlike the other three classes, Dr A2’s class was arranged in a hall instead of a classroom. However, the conditions in the other three classrooms made the researcher describe it as an “*excellent general environment*” overall. One of the other three was affected by an “*annoyingly loud*” air conditioner and an unclear projector affected the other three. Another suffered from unsupportive desks and an

echo that reduced the clarity of the teacher's voice. The third, also a CSCL class, did not have these drawbacks, but there was still some side-talking on topics unrelated to the lesson, and a few students did not interact as much as others and did not participate. This shows the importance of the classroom environment and the learning arrangement, given that there was stricter reinforcement of the learning requirements and objectives in the other CSCL class. Knowing that most problems of distraction were in the two TCL classes might suggest that students are only more attentive in CSCL classes, but the TCL classes did not have a supportive environment; rather, the environment was disruptive and must have contributed to making students uneasy and, therefore, more inclined to waste their time. The other likely factor in explaining this situation, namely engagement/motivation and additional support, is also evident in the data. Dr A2 ensured his students could express their ideas openly and made it easier for the shy students to participate. These conditions made it easier for the students to engage, interact, and experience learning, leaving no time for distractions.

### **7.12.2 Overcoming shyness**

As mentioned in section 8.4.4, some of the findings in this study suggest the presence of cultural factors in affecting teachers' and students' perceptions of CL. These factors could be peculiar to Saudi culture, but also to similar cultures in other Arab countries. For example, CL is particularly helpful for shy students to overcome their shyness. This was also observed in Dr A2's class. This was an original finding not mentioned previously in the literature. One interviewee described CL as "*an amazing thing*" due to its ability to help with some shyness problems and enable students to acquire knowledge and experience. Another said it could eliminate shyness and inattention. One teacher also admitted: "*Collaborative learning paves the way for the student to get rid of shyness*" by removing the negativity associated with some students commenting on others in the class. Similarly, another teacher sees CL as enabling "*even the shy person*" to participate because "*it breaks the shyness barrier*" and gives students more self-confidence. FG4 expressed this as limiting shyness and CL, making it easy for students to express their opinion and participate in class (see section 7.5.2.5).

That several participants mentioned this capability several times shows that it is considered a prominent one for CL. Still, importantly, the contexts in which they were mentioned point to CSCL. This is understandable because TCL is conducted F2F, whereas CSCL can be arranged at any distance. It could be that the physical distance gives students greater confidence to interact, communicate, and discuss more openly with their fellow students.

### 7.12.3 Maintaining a power distance

The preference for teachers to maintain their power distance is indicated by several findings on what were identified as facilitators:

- Need for teachers to retain wider control over the students.
- Need for lecturer intervention.
- Teachers should modify or adapt the information students obtain through CL.
- Teachers should give students clear and understandable information before the collaboration.

All four of the above were identified as facilitators of CL and are listed in Table 22 as such. They are analysed in section 8.4.3. They share the same underlying motive of trying to control the collaboration and thereby retain control over the students by maintaining the traditional power distance between teachers and students to at least some extent. This explains, for example, wanting to ensure the ‘correct answer’ is reached, which was expressed by several participants in the data. In the focus groups, it was mentioned in focus groups 1, 3, 4 and 6 (not 2 or 5), and Dr A and Dr S1 shared this view. One student in FG4 expressed the need for “*a corrector... who understands the answer*” and who can, therefore, distinguish between “*both the right and wrong ones*”. Another described it as finding an answer with your group and colleagues where the correct one is chosen and the wrong one is excluded (see 7.2.3).

If a teacher wants to control this process from a question to an answer, “*the correct one*” has pedagogical implications. This controlled CL mode of learning reduces the power distance, which is why cultures with a high power distance are less inclined to make arrangements for CL (Zhu, 2011), or, as we see in this case, they try to adapt this model of learning to retain the power distance. Saudi students are accustomed to being dependent on the teacher, and Saudi teachers are used to exerting control over their students. One student said himself that CL enables students to depend on others. The need for a competitive environment within an overall collaborative environment supports the desire to keep the power distance high. This expresses students’ need to depend on other students, which is also a power distance based on the academic level. These recommendations made by both teachers and students are designed to reinforce these dependencies (teacher-student and student-student).

However, this position is not shared by all the participants. The data overall show strong support for CL and student-centred learning practices. See, for example, descriptions of CL such as “*exciting*” and “*amazing*” (see 8.3.1) and the positive prospects for CL expressed by teachers (see 8.4.4). The

few sentiments indicating the desire to maintain a high power distance could mean that some teachers prefer to adapt CL to fit Saudi culture or would feel more comfortable with CL if this were done. This suggests the Chinese model investigated by Zhu (2011) might be more appealing in the Saudi context where CL is more managed under a collectivist and competitive environment, instead of the Western model of student-centred teaching in which students have more self-control over their own learning. More research could be conducted in this area to see which form of CL would suit Saudi culture or have better prospects. This is taken up further under recommendations in the conclusion chapter.

#### **7.12.4 The superiority of CL over traditional learning methods**

Several participants' responses give the impression that the participants believe CL is superior to common CL or traditional learning methods. For example, CL was described variously as "*a modern method*", "*easy and flexible*" for passing information, "*better*" than "*old learning*", able to "*provide more accurate information, and... remember information faster*", making learning easier since "*the student writes the information by himself, so he has to pay attention to it*", enabling "*thinking and to understand faster... so you will remember the information faster*", and so on. This is another point of pedagogical importance because if CL is superior to non-CL, it would deserve to be adopted more widely. One possibility is that the participants were overeager to give this impression given that the research was about collaborative learning, and they recognised it as "*a modern method*". They wanted to be seen to be in line with the latest trends in education and not be seen as being opposed to them.

#### **7.12.5 CL tool**

In the sixth focus group session with students, the previous experience in using CL was "*in the form of groups*" for sharing "*answers and ideas*". They collaborated using Microsoft Access, and "*the benefit was that everyone gives a result*". An advantage experienced was that "*If you had the wrong information, the group may correct it and provide you with extra information*". Also, "*we can get the answer within a shorter time, and there would be more sharing*". Another student participated in a WhatsApp experiment in which there were groups and the answer was shared. Another used Microsoft Access to design a database and distribute the work in which "*the results were excellent*". Relevant themes for this were discussed earlier, but it may be noted that Dr S2 had used wikis and Blackboard in the past. Another also used wikis that caused him to acknowledge a "*paradigm shift*", and another uses an "*educational forum*" for which more details are needed.

## **7.12.6 Comparative analysis**

### ***7.12.6.1 Similarities in the responses of teachers and students***

There were many similarities in the responses of teachers and students, but some notable ones are highlighted here. For example, when describing their past experiences, both teachers and students used the same highly favourable adjectives, such as “*wonderful*” and “*amazing*”. Among the benefits or opportunities identified by both teachers and students in common were attitudinal changes in students. For example, some students admitted to CL making them more attentive, improving their self-confidence, and helping the shy overcome their shyness. More opportunities agreed upon or mentioned by both teachers and students are listed in Table 21.

### ***7.12.6.2 Differences in the responses of teachers and students***

An area in which teachers and students differed in terms of past experiences was that when discussing their past experiences, the students mostly emphasised the benefits of CL for what it enables. Teachers, however, highlighted the opportunities it presented and the restrictions they faced. Also, as may be expected, teachers’ emphasis was mostly on teaching opportunities and students’ learning opportunities. This shows a difference of emphasis and that teachers were more mindful of the restrictions involved. Thus, teachers had a richer experience of benefits, which included the opportunities CL provided and the challenges they faced. On the other hand, the teachers pointed out some restrictions, such as having to complete the curriculum.

In identifying the benefits of CSCL tools, the teachers mentioned additional benefits that students did not recognise. For example, teachers noted positive changes in their students’ personalities, which the students did not mention. Students perhaps did not do this because they failed to see the difference due to the incremental nature of the changes over time, as when one notices a change in someone when seeing them after a long time, but the person does not notice the same themselves. The same can be said for forums that teachers also consider beneficial for submitting or presenting ideas.

In terms of academic benefits, teachers realised some benefits that were not mentioned by their students. These include improved communication skills, team-working abilities, and acquiring other related skills. However, there is another important area of disagreement between the two parties, which is distractions in class. As discussed in section 8.4.1, the teachers perceive distraction as a problem in some classes, which was confirmed during the observations. These distractions took the form of mobile phone use by students during class time, students talking among themselves on matters unrelated to the lesson, and distractions due to classroom equipment. The first two are more easily avoidable if students can be made to be more attentive in class. However, despite confirming

these distractions in three of the four observed classes, students did not mention any such problem. More opportunities mentioned only by either teachers or students, but not both, are listed in Table 22.

### ***7.12.6.3 Comparisons between TCL and CSCL***

By the nature of CSCL, due to its dependence on computer technology, the internet and CSCL tools, all those findings that mention benefits and challenges related to these refer to CSCL rather than TCL. On the other hand, connotations with non-computer-based or traditional methods, benefits, and limitations refer to TCL. In some cases, this is apparent. For example, users found CSCL very effective when arranging audio or video debates and searching quickly for information through documents, which are not possible under TCL. Similarly, concerning limitations, technical issues do not affect TCL, as they do CSCL. However, it is not so apparent in other cases. For example, more and open sharing of ideas was true for CSCL while engaging in forums.

Based on past experiences, teachers pointed out that CSCL saves them more time than TCL. In describing opportunities, teachers and students agreed that CSCL is also easier and more flexible. It is widely recognised that CSCL can overcome spatial and temporal constraints to allow teaching and learning to occur at any distance through the internet and at any convenient time. At the same time, its technical nature requires more specialised training and support for teachers and students compared to TCL. As shown in Table 22, there were no special facilitators exclusive to TCL, whereas CSCL did have some and they were all of a technical nature. Despite these opportunities presented by CSCL, TCL was more favourable in other ways. For example, the users experienced it as providing benefits more directly than CSCL, despite being more time-consuming. Regardless, when asking for teachers' opinions on the future outlook for CL in Saudi Arabia, it is pertinent to note that the entire focus was specifically on CSCL. This shows they perceived CSCL, not TCL, as playing a leading role in the ongoing development of the kingdom. This may be expected given the importance of digital transformation in the changes at a national level.

The observations provided more opportunities for comparing TCL and CSCL because two classes each adopted one of these two methods. The working conditions were different due to the use of computers in the two CSCL classes for collaborating. Another feature noticed was, as mentioned earlier, participation, attention, focus, and distraction. The problem of distraction was most evident in the two TCL classes. It could be due to more opportunities for students to be idle or to find other non-relevant activities to waste time on, whereas computers keep students more engaged or occupied. In one of the two CSCL classes, some students were not participating actively, but, overall, there was still a strong focus on interaction and collaboration. While this observation suggests distraction is

more prevalent in TCL classes, it is not entirely the fault of the students, given that it was also observed that both TCL classes suffered from a poor environment. The loud air conditioning in one of them and unsupportive desks in the other could have contributed to the lack of focus and students taking advantage of this situation. For example, no student in the first focus group had previous experience of using CSCL to describe. There had been previous experience of CL, but without using a computer. This shows the trend from TCL to CSCL in Saudi Arabia.

## CHAPTER 8 - FURTHER ANALYSIS AND DISCUSSION OF FINDINGS

### 8.1 Introduction

Having presented the study's findings in the previous chapter, the themes and sub-themes that emerged are analysed and discussed in the present chapter, through mind maps (attached in Appendix F) and in a cross-comparison of the responses and the literature review. The main branches are the themes in the mind maps, and its sub-branches are the sub-themes. An analysis of the collected data focusing on meaning was necessary as part of the overall qualitative design methodology applied in this study. This involved, as mentioned earlier, using Stake's (2005, cited in Cohen et al., 2018) parameters for finding patterns in data as evidence of initiatives, characteristics, processes and techniques, triangulation to compare data from different methods and groups, and drawing interpretations to form a synthesised analysis (see section 6.5.2). The subsections in the first part of this chapter correspond and relate directly to the sequence of the objectives and research questions of the study, as shown in Table 19. Key points from this analysis are then discussed further.

**Table 33: Focus of discussion and the study objectives**

Obj./RQ	Focus of discussion	Section in which the Obj./RQ is covered
1	Deployment and practice of CL in the preparatory year	8.2
2	Perceptions of students and teachers of CL*	8.4
3	Experiences of students and teachers of CL*	8.3
4	Factors that may assist or hinder CL among students*	8.5

\* With and without the use of CSCL tools

It is important to revisit the research questions to help in understanding this chapter. RQ1 sought to know how CL is deployed and practised in the preparatory year at the selected university, RQ2 was devised to determine students' and teachers' perceptions of CL, and RQ3 was intended to assess their previous and present experiences in terms of TCL and CSCL. RQ4 then sought to identify factors that either help or hinder CL among the students. While the third question is more generally concerned

with experiences, the fourth is more focused on factors reported to have either assisted or obstructed the implementation of CL.

## **8.2 Definitions, Deployment, and Practice**

### **8.2.1 Collaborative learning definitions as a theme**

The findings relating to the meanings of CL in this study revealed three main types or groups of CL definitions given by the teachers: general definitions, definitions that emphasise purpose, and those that emphasise involvement.

The general definitions include “*self-education*”, which describes CL as a process, and “*a learning style where students are grouped*”, which refers to how it is typically arranged. Some general definitions were worded imprecisely, but most participants defined CL from the perspective of learning and some analogies were given, such as likening CL to **thinking in a group**, which emphasises its functional aspect. Such a definition is compatible with the argument in Smith and Macgregor (1992) that CL is an umbrella term for a variety of educational approaches. Furthermore, it includes a collective intellectual effort by students or students and teachers together. Thus, students can work in two or more groups, jointly searching for understanding, solutions, or meanings.

**Similarly, this method actively involves** learners processing and synthesising data and perceptions instead of using rote facts and figures memorisation (Valamis, 2022). In other words, CL mainly focus on students’ course material exploration or application, not just the teacher’s presentation or explication. In this way, research on CL as a self-education technique suggests that it replaces the typical teacher-centred or lecture-centred setting in college classrooms. Smith and Macgregor (1992) explained that the lecturing/listening/note-taking process in collaborative classrooms might not dissolve completely, but resides alongside other methods grounded in students’ arguments and active work with the course material. Consequently, teachers using CL approaches think of themselves less as expert knowledge transmitters to students and more as expert intellectual experience designers for students – as coaches or as midwives of a more emergent learning process.

From a different perspective, Kuo (2015) contended that a learning style-based collaborative learning approach is important to cope with EFL students’ learning performance. CL usually utilises grouping, but few studies have examined dissimilarity in group members’ learning styles. This is also in line with the findings of Alfonseca et al. (2006) of the effects the combination of students with different learning styles in specific groups may have on the final results of the tasks accomplished by them collaboratively. Comparing students’ learning performance and interest in learning with the proposed

approach with those learning with the conventional CL approach, Kuo (2015) demonstrated that homogeneous learning style groups outperformed the heterogeneous groups. Furthermore, those students applying the online English CL approach outdid those relying on the traditional paper-based English CL approach. The findings of the present study are in line with these arguments. *The interviewees in the present study admitted that CL helps their learning abilities and breaks the psychological barriers while they collaborate.* Thus, CL strategies in Saudi Arabia seem to have an inclination towards effectiveness as they increase students' satisfaction in their learning outcomes, experiences, and achievements. CL also mitigates some of the challenges that shy Saudi learners face, as it provides them with an environment in which they can express themselves comfortably.

Definitions that emphasise purpose include support for learning as part of “*integrative role-based education*”, *which emphasises that knowledge from different domains and contexts is brought together to enhance the learners' experiences (Marcotte & Gruppen, 2022).* This reflects the process-based definition of Roschelle and Teasley (1995). As mentioned, the definitions that emphasise purpose, for example, in Cullen et al. (2013) and Bouroumi and Fajr (2014), were introduced in section 3.3. The definitions that emphasise purpose focus on the opportunities of CL provided to students. Chioran (2017) supports this argument. For instance, she claims that learners benefit when CL takes place and they work in a group setting. In addition to making students more active, as one student pointed out, CL helps obtain greater and more varied information and facilitates gathering ideas. The information is for accomplishing tasks given to students learning collaboratively, including creating educational material together either in the process or as an end goal. Therefore, CL is an approach that seems to encourage students to create groups and work together to solve a given problem.

Other definitions that emphasise involvement mention interaction and discussion towards reaching a specific solution. Such definitions are compatible with the idea that various studies have shown that utilising collaborative learning may lead to increased involvement and better knowledge retention (Valamis, 2022). Thus, the outcomes of such knowledge acquisition and retention are that the process of CL allows participants to achieve higher levels of thought, and the information is retained much longer than when learned in a non-collaborative setting. Such arguments resemble Zambrano et al.'s (2019) finding that students who learn in groups with high interactivity-level tasks require relevant group work schemas. Learning tasks needed to be solved with all information elements provided to group members, and information distribution is varied to test its effects on inter-individual activities. However, the findings of the present study show that a few lecturers described this as reaching an “answer”, which implies there is only one correct solution to a problem. Regarding CL as a process

in this way has pedagogical implications. The students also noticed this during the initial group discussion. The definitions that students have provided for CL (see section 7.3) showed they perceived the purpose of CL the same way as the teachers, **for collectively having accurate answers or information**. The responses, such as the ability to “*remember information faster*”, reinforce the view that many students regard learning traditionally as involving reaching proper knowledge and memorising information. The main themes (classifications, process-based definitions, and purpose/involvement-based definitions) and sub-themes that emerged from the data on definitions of CL by both groups (teachers and students) are presented in the mind map in Figure 5 in Appendix F.

Moreover, CL centres the teacher in the position of coach and places the student as a player. Thus, the definitions articulated by teachers and students at Hail University resemble the meaning of CL in the literature reviews investigated already, but, in general, CL in Saudi Arabia revolves around an approach that engages learners to work together on activities or learning tasks in a group small enough to ensure that everyone participates.

Therefore, in the case of Saudi Arabia, the definition and practice of CL may be influenced by the country’s cultural and educational context. For example, the cultural dimensions of power distance and collectivism may affect the role of teachers and students in collaborative teaching and learning. Furthermore, the emphasis on rote memorisation and traditional forms of instruction in the Saudi educational system may pose challenges for the implementation and acceptance of CL practices. Overall, while the fundamental principles of CL may be similar across different regions, the specific definitions and practices of CL may vary depending on cultural and contextual factors.

### **8.2.2 Deployment of collaborative learning at Hail University**

At the start of the research, it was observed that collaborative learning at the selected institution was deployed in two modes: one mode of deployment is referred to in this study as traditional or non-computer-based CL (TCL/non-CSCL); and the second is computer-based, known as computer-based collaborative learning (CSCL). The literature reviewed covers both modalities extensively. It was shown that the former has roots that can be traced back to ancient times (see 3.2). Briefly, Hail is one of the Saudi regions where traditional education took place. Since ancient times, it has known various types of schools. Some were concerned with teaching the Qur’an, and others with teaching the principles of reading and writing. In addition, most schools were dedicated to educating males, and there were few schools for girls’ education (Alhamood, 2020). In this regard, Askool (2011) claimed that traditional educational institutions do not prepare students with skills and abilities that enable them to benefit from such competencies in trade and entrepreneurship, especially skills related to

information technology. Nevertheless, the findings of the present study showed that CL paves its way in Saudi higher education, although it is in its commencement.

Similarly, Alharbi (2019) claimed that Saudi Arabia focuses on providing a quality of education that ensures that students are well prepared when handling future challenges, such as globalisation, economic change, and cultural change and diversity. This is compatible with Alnesyan's (2012) findings that teaching and learning improve students' ability to face complex and difficult challenges in their social context. However, educational systems in the Saudi context do not help and foster learners' thinking skills and students' motivation to invest such skills. Alkhadra (1994) also confirmed this finding by stating that traditional pedagogy does not enhance the development of students and does not live up to the changing standards of the market in Saudi. Nevertheless, the findings suggested that as CSCL came about in more recent times with the advent of computers and the internet (see 4.4), Saudi Higher Education is adapting to this new teaching style.

The universities are unable to split definitively from traditional education. Saudi Arabia needs technology experts and cooperation from the international community to advance its teaching methods. Aljaber (2018) defended this claim, stating that the challenges confronted and the approaches that all Saudi universities are applying to help and develop e-learning necessitated the support of international partners, particularly the UK and the US, in supporting e-learning financially, socially, and technologically. Thus, Aljaber (2018) continues to argue that "the Kingdom of Saudi Arabia has obtained significant support from the US and UK, with both countries contributing to the establishment of an integrated model for e-learning curriculums and information management systems in Saudi Arabia". Furthermore, since the Covid-19 pandemic, the Saudi Minister of Education announced that the traditional curricula in Saudi Arabia would be turned into digital curricula by 2022. Different studies support this argument that Saudi Arabian general education changed in the spring semester of 2020 (Abdulrahim & Mabrouk, 2020; Almaghaslah & Alsayari, 2020; Hassounah et al., 2020; Hoq, 2020; Khalil et al., 2020; Tanveer et al., 2020). Alshlowiy (2021) also argued that the speedy shift into online learning instigated by Covid-19 created many issues and new educational methods across all educational systems. Nonetheless, the present study findings are inconsistent with the findings of this study in showing that CL is still applied with traditional CL.

Finally, characteristics common to TCL/non-CSCL and CSCL were also pointed out (see 3.5). However, there are challenges facing the model, especially in implementation. One example is changing teachers' mentality about schoolwork to guarantee students collaborate effectively.

Furthermore, this model is weak in Hail University because most students lack self-motivation. This is in line with StudyCorgi's report (2021) that

The use of learner groups in the traditional education system requires an elaborate restructuring of the curriculum both in the course content and resource allocation. In most cases, the time allocated for classwork, where the teacher is giving notes and assignments is hardly enough. It is more complicated to allocate adequate time for learners to discuss and undertake group work projects. It isn't easy to have learners mastering concepts and skills and at the same time covering syllabus content in the designated timeframe.

Finally, the analysis of CL at Hail University was significantly aided by the application of various learning theories. In this section, I discuss how learning theories have helped in the analysis of CL at Hail University, with reference to relevant literature.

Cognitive theory has been particularly helpful in understanding how CL improves learners' cognitive abilities. According to cognitive theory, learning involves acquiring knowledge, understanding concepts, and problem solving, all of which are enhanced by collaboration with others. Collaborative learning allows students to interact with each other, exchange ideas, and build on each other's knowledge, leading to a deeper understanding of the subject matter. This is particularly relevant in the Saudi Arabian context, where traditional teaching methods rely heavily on rote learning and memorisation, often resulting in a shallow understanding of the material. By contrast, CL encourages active participation, critical thinking, and problem solving, enabling learners to develop more meaningful and lasting knowledge (Mehmood & Taswir, 2016).

Social constructivism theory has also been influential in understanding how CL operates at Hail University. Social constructivism emphasises the importance of social interaction in the learning process, suggesting that knowledge is constructed through shared experiences and interactions with others. In the context of CL, learners engage in group activities, work collaboratively to solve problems, and share their experiences and perspectives, all of which contribute to the construction of knowledge. This approach is particularly relevant in Saudi Arabia, where collectivist values emphasise the importance of group harmony and social cohesion (Al-Fudail & Mellar, 2008). Social constructivism theory recognises the significance of these cultural values and highlights the importance of creating a social platform before knowledge, ensuring that learners feel comfortable and supported in their learning environment.

In conclusion, learning theories have played a crucial role in the analysis of CL at Hail University. Cognitive theory has been useful in understanding how CL enhances learners' cognitive abilities, while social constructivism theory has helped to explain the importance of social interaction and

cultural context in the learning process. By considering these theories, researchers and educators in Saudi Arabia can develop more effective approaches to teaching and learning, helping to enhance the educational experiences and outcomes of students.

### **8.3 Collaborative Learning Experiences**

#### **8.3.1 Past experiences as a theme**

The students who took part in this study claimed that CL enables the sharing of views, quicker communication, encourages questioning and discussion, makes them more thoughtful and responsive, leads to gaining extra information, supports brainstorming, and encourages them to express themselves more openly. Such communication opportunities have been reported in several previous studies (see Table 6), which is discussed further under opportunities of CL. Similarly, the encouragement of discussion is also well supported (Almajed, 2015; Nooijer et al., 2021). Assuming that the expression of ideas is akin to expressing views, Biasutti (2017) also found the sharing of ideas to be promoted by CL, and Yucel and Usleul (2016) that students express themselves more openly. However, in both cases, when done in forums, their findings apply only to CSCL. Similarly, gaining extra information could be considered knowledge building, which is well supported in the literature (see Table 6). Questioning, being more thoughtful and responsive, and facilitating brainstorming are new findings not mentioned in the literature reviewed.

The teachers who participated in this study reported that they experienced six additional advantages. For instance, the teachers themselves benefited from being in contact with all their students. This is in line with the findings that working closely with colleagues in teams creates important emotional and psychological benefits. Other benefits mentioned by the teachers based on their past experiences with CL were opportunities they noticed for their students. These included CL helping students discover new skills, allowing them to search easily, giving them opportunities for questioning, and helping them in self-development. The restrictions faced by students were a lack of support for self-development (compared to the support they felt was present in their most recent or current experience of CL) and not enough opportunities from the teacher compared to their colleagues. Rogoff (2003) explained that teachers reported feeling restricted by having to complete a curriculum. These additional findings emerged in the present study, except for CL supporting students' self-development.

The descriptions of the participants' overall experiences show commonalities between teachers' and students' previous experiences of CL because the respondents from both groups shared similar views. These common descriptions were that CL was "*wonderful*", "*a rich experience*", and "*amazing*".

Another noteworthy observation is that one teacher perceived TCL as benefiting directly but taking more time than CSCL. This indicates a key difference between TCL and CSCL and may support the related finding that CSCL saves time. Teachers also found CSCL to give “*more positive results*” and that it is most effective for audio or video debates and creating virtual classrooms, which are not possible for TCL. The time-saving potential was also mentioned by Christopher (2003), and that it was due to CL having a positive impact on motivating students in large lecture classes. However, as the literature review showed, CSCL can also lead to time being wasted if, for example, there is inadequate preparation for the CL sessions (Almajed, 2015), frustration in the students or lack of coherence among them (Capdeferro & Romero, 2012). Inadequate preparation, for example, has a negative impact on time because it reduces interactions and learning. This is inconsistent with the findings that a set of practical and circumstantial factors often needs to be in place to facilitate learning in Saudi Arabia. These factors relate to overcoming some of the barriers to learning, such as noise, unaccommodating environments, and time wasting due to the inconvenience of the learning tools, mobile phone use by students as an example.

### 8.3.2 Present experiences as a theme

The present experiences of the participants (four teachers and their students) were observed in four arrangements to allow for four different possibilities: a technical/non-technical class using CSCL/TCL. This allowed the drawing of comparisons between technical and non-technical classes and between CSCL and TCL classes to show what difference using a computer makes to CL. The only commonality between the classes was that all four comprised male students aged 19.

Looking at the whole set of observations for each class, the following points may be noted:

- **Dr A2’s class** (CSCL, technical) – The arrangement was in a hall rather than a classroom, but the environment was described as “*excellent*”. However, the attempt was to obtain what they considered the “*right information*” correctly. Importantly, the experience helped students overcome shyness, besides other opportunities, such as sharing ideas and greater understanding.
- **Dr F’s class** (TCL, technical) appeared to have experienced the most problems, such as inattentive students, some students not being active enough, and side-talking. This led to some lack of participation and confidence, and some students not listening enough. There was also unease among some in sharing ideas. More seriously, an issue of distrust was apparent, the projector was unclear, and a loud air conditioning unit caused a disturbance.
- **Dr J’s class** (CSCL, non-technical) – This class appeared to have had the strongest outcome in terms of focus, interaction, and collaboration, despite having some students not participate

and a problem with side-talking. This success might be attributable to the strict lesson reinforcement, good interaction ensured by the teacher, and the competitive atmosphere created between the groups.

- **Dr S2's class** (TCL, non-technical) – This class appeared to have had the least desirable learning arrangement, with unsupportive desks, some students not being serious, and the use of mobile phones during class time. However, as in Dr A2's class, there was an attempt to reach a “*right answer*”. Despite the unsupportive environment, the interaction was active, and most students were confident. This supports the findings showing students face a wide range of barriers that influence the likelihood of their participating in learning. These have been classified within the literature as institutional barriers arising from educational institutions' unresponsiveness or a flexibility absent in the provision on offer, such as inappropriate scheduling or content of provision; and as dispositional barriers that relate to the attitudes, perceptions, and expectations of students, such as believing that they are too old to learn or lacking confidence or interest.

This entails that CSCL has the potential to provide students with enormous benefits that might not be provided by its counterpart (i.e., traditional teaching or TCL). Different research has indeed demonstrated the inadequate benefits of CL, especially in countries such as Saudi Arabia, where CL is still in its early stages and where its implementation faces difficulties inflicted by the old-fashioned systems of teaching and learning (Al-Jarf, 2013; Al-Zahrani & Salama, 2013; Alharbi & Smith, 2015; Masmali, 2016; Alqurashi, 2017). In this regard, the present experiences of both teachers and students demonstrate how Saudi HE is lagging behind in terms of CL. Thus, in this chosen example, CL did not reduce the efforts among group participants or increase the practical efficiency of obtaining the same or more benefits with less effort. Rather, it highlighted that working with a partnership approach heightens the awareness of conflicting tensions and priorities between the differing perspectives and motivations of those involved, particularly students, tutors, and course coordinators, at the individual and institutional levels. This is compatible with the arguments in Alkhannani (2021) that such challenges led to differing opinions of one another's tasks and roles in the collaboration process. It increases tensions around power differentials, participation reward and recognition, identity, and accountability for each partnership. The environment in which CL takes place also seems unproductive for this model to be effective and develop as it does not allow a great adoption of such methods of teaching and learning, leading to unbeneficial outcomes and negative experiences for both teachers and students. This concept is also found in Alkhannani (2021), who claims that teachers may centre on carving out time for collaborative work with students on top of their existing heavy workloads, as well as how students can meaningfully contribute to the development of teaching and learning materials when they may lack subject or pedagogical knowledge. Furthermore, García-

Valcárcel et al. (2014) argue that although many schools have adopted collaborative learning, there are some disadvantages, such as wasting time in the classroom, lack of control of student behaviour, and different personalities among the group members, which could lead to longer decision-making processes. There are also participants in the group that do not perceive the value of collaboration and need more guidance from the teacher to facilitate their involvement in their group. Considering that collaborative learning can be among children and adults, it requires precise control from the teacher.

Based on these observations alone, it may be concluded that the two CSCL classes were somewhat effective, as shown by Dr J's non-technical class, and the two TCL classes struggled the most, especially Dr F's class, from multiple problems. As for the present experiences of students, from the students' own perspectives, teachers also highlighted their positive experiences and the opportunities they realised from allowing their students to use CL. The main themes and sub-themes that emerged from the data on experiences of CL are presented in the mind map in Figure 7 in Appendix F. The findings revealed by this analysis contribute to this study, as they show what kinds of problems in the classroom environment disrupt the ability of students to work collaboratively in an effective manner and the impact the environment can make if well organised.

The descriptions by the participants of their present experiences revolved around effective tools and methods, learning and other positive aspects, negative aspects, requirements and restrictions, and descriptions of teachers' overall experiences. Several effective tools were identified. These included forums, brainstorming, peer learning and role playing, as well as effective methods, divided into those applied before and during a lesson. Forums are common tools to support CL (Caballe et al., 2011; Hewage & Perera, 2013; Yusop & Abdul Basar, 2016). It was noted in the literature review that Yucel and Usleul (2016) found that a forum took on the form of a knowledge-building environment that contributed directly to helping students form opinions and express themselves. Similarly, Biasutti (2017) found forums most useful for discussing and sharing ideas. The 700 students in the study by Caballe et al. (2011), for example, also found the same, forums being used as part of a learning system. It could be that their effectiveness was due to teachers monitoring tasks and evaluating the discussions easily. From the interviewees' perspectives, these tools indeed have a great impact on their learning, as they provide a platform on which their ideas and expression are articulated to build their knowledge and exchange opinions to enrich their experiences.

The effectiveness of brainstorming seems to resonate in this study as students discuss and generate ideas before the production is written. This is compatible with Alqasham and Al-Ahdal's (2022) findings that utilising mind mapping as an interactive brainstorming tool enhances students' writing

efficiency and mindset. Thus, remarkable benefits are accruing from mind mapping as a digital brainstorming technique in improving attitudes of Saudi EFL learners to writing skills. As for the use of the internet, this might imply that students find or perceive CSCL to be more effective than TCL. Giving feedback, specifically epistemic feedback, the importance of which was established by Guasch et al. (2013), and arranging rich problem-based contexts (Kirschner et al., 2009) are two methods found to be effective in supporting CL that were not mentioned in the current study under present experiences.

Furthermore, as Gu et al. (2017) recommended, taking thinking styles into account was also not mentioned. On the other hand, encouraging students to participate and interact is supported, for example, in the study by den Exter et al. (2012). Several studies also confirm the importance and role of discussions during a lesson (see Caballe et al., 2011; Law et al., 2011; Geiss & Roman, 2013; Hewage & Perera, 2013, Almajed, 2015; Nooijer et al., 2021). In addition, Jarvela and Hadwin (2013) mentioned that discussion tools have the advantage of being subjected to the monitoring and regulation of learners. However, it can be noted that discussions can become saturated up to a certain point, and more discussions do not add anything useful (Rimor et al., 2010). Furthermore, Sherblom et al. (2013) noted that the quality of a discussion is greatly affected by the students' knowledge, skills, motivation, and apprehensions. This means that adopting new technologies has instigated changes in methods of learning, particularly at the undergraduate level, with standardised courses often delivered online, permitting the different use of classroom time with more small seminars and interactive discussions, and greater time spent with students on their individual projects. Other methods found to be effective in the present study, but not noted in the previous studies examined, are briefing students before the lesson, which a teacher described in the data as giving "*basics*" before grouping, questioning them, and setting "*behavioural and procedural objectives*". These are elements that a teacher might expect when preparing students for collaborative learning. Given the importance of adequate preparation in CL sessions (Almajed, 2015) and being coherent (Capdeferro & Romero, 2012), noted earlier, briefing and setting objectives should be considered essential in arranging CL. In this way, the findings showed that lectures were useful to students once they had to link to these other components of the course through preparing students to tackle what comes next and debriefing and consolidating what they have just done.

As for creating a competitive environment endorsed by the above observations, Zhu (2011) found the same true only among Chinese teachers and not Flemish teachers. This highlights a cultural difference and shows that Arab teachers share the same view as their Chinese counterparts concerning promoting competition among students. Similarly, the important role of building opinion and expression for

students confirms the study by Yucel and Usleul (2016). However, some students fear expressing themselves and giving negative impressions (Jung et al., 2012). This issue is covered later under drawbacks.

That collaborative learning can make students more interested in learning is something explicitly supported by various studies in the literature reviewed and relates to motivation (Johnson & Johnson, 2003; Tsai, 2011; Chen et al., 2018). The study by Warsah et al. (2021) mentions an impact of CL on improving students' motivation for learning, which could mean the same as making students more interested in learning. Other potential opportunities of CL pointed out, namely enhanced focus and attention, increased capacity to understand, gains for weaker students, enhanced interaction, new experiences, and intellectual stimulation, are analysed and discussed under opportunities of CL.

Similarly, several general positive aspects were identified in the data on present experiences. Those aspects which confirm the same in previous studies are that CL makes students enjoy the learning (Mutdrivanti, 2016), they become more self-confident (Chang & Windeatt, 2016), and improve their communication skills (Mahawan & Langprayoon, 2020). In addition, it promotes competition (Zhu, 2011). Two of the remaining beneficial aspects of helping to achieve a lesson's objectives and making lectures go smoothly were not mentioned in the previous literature. Concerning time saving, the present study lends support to a similar finding by Christopher (2003). However, it contradicts Capdeferro and Romero's (2012) and Almajed's (2015) research that CL, specifically CSCL, can also cause wastage of time. As mentioned earlier, this suggests that there are underlying factors, such as sufficient preparation and the classroom environment, that determine whether time is saved or wasted.

## **8.4 Collaborative Learning Opportunities as a Theme**

The opportunities presented using CL were examined separately in respect of the perspectives of teachers and students. This is because teachers' views are mostly focused on teaching opportunities. In contrast, students' attitudes are mostly based on learning opportunities. The separation was also made so that the two perspectives can be compared to ascertain what teachers and students agree or disagree on.

### **8.4.1 CL opportunities as perceived by teachers as a theme**

The research findings on CL opportunities perceived by teachers were presented in Chapter 7, section 7.5.1. The data identified six main lecturer-perceived opportunities: teaching methodology and tools; advantages over traditional methods; knowledge- and learning-related opportunities; skills and experience; interaction; communication and teamwork; and other personal opportunities. This is in

line with the evidence from various studies that highlighted the importance of CL for teachers as a method of teaching that promotes learning, enhances the teacher-student relationship, yields educational benefits through working as groups and teamwork, and challenges students to build new skills (Laal & Ghodsi, 2011; Garbin et al., 2015; Le et al., 2016; Orlando, 2016; Ansari & Khan, 2021). In addition, the main themes and sub-themes that emerged from the data on definitions of CL are presented in the mind maps in Figure 8 and Figure 9 in Appendix F. Along parallel lines, the definitions provided by the teachers touch upon the same main benefits or opportunities which are identified for CL as a method, which are CL tools, learning, information and knowledge, experience and skills, interaction and team-working, convenience, students' attitudes and feelings, and other benefits that apply to teachers.

The mind map in two parts shows numerous opportunities, as perceived by teachers, which are classified into six categories: opportunities as a method, CL tools, learning opportunities, opportunities in terms of information and knowledge, opportunities in terms of experience and skills, interaction and team-working, convenience, students' attitudes and feelings, and opportunities specifically for teachers. The largest categories are learning opportunities and students' attitudes and feelings. Since many of the potential opportunities for students highlighted by teachers were also mentioned by students themselves, the two sets of data are discussed together in the next subsection. The opportunities identified for teachers, namely, greater opportunities to guide students, were present in the study by Guasch et al. (2013) when the teacher guided students before the lesson by giving detailed information of the steps that would facilitate their collaboration. Thus, the findings indicate that CL is highly effective for teachers in Hail University in the sense that it allows them to highlight critical details, offer interactive lessons, and encourage students to use different skills to build their knowledge and experiences. This is in accordance with the study by van Leeuwen and Janssen (2019) that examined the connection between teacher guidance strategies and the processes and outcomes of collaboration among students. Their outcomes demonstrated that various features of teacher guidance are encouragingly related to student collaboration, such as the focus of teachers on students' problem-solving approaches. During student collaboration, prospects develop so that students engage in collaborative activities that help their learning process. The way teachers take more or less control of these moments defines whether such opportunities are turned into real moments of learning for students.

#### **8.4.2 CL opportunities as perceived by students**

The findings from the research on opportunities of CL were presented in Chapter 7, section 7.5.2. Five main types of CL opportunities as perceived by students were identified from the data: the

opportunities it presents as a method; advantages over traditional methods; interactions; impact on learning and knowledge; and additional opportunities for students. The main themes and sub-themes that emerged from the data on student-perceived opportunities of CL are presented in the mind maps in Figure 10 and Figure 11 in Appendix F. The main areas in the case of students are CL as a method, personal effects of CL on students, time and effort, the environment, knowledge and information, and learning-related benefits. The sub-themes for the last, as examples, are remembrance, ease of learning, and improved understanding.

The mind map in two parts shows numerous opportunities as perceived by students, which are classified into seven categories: opportunities as a method, personal effects on students, participation and interaction, opportunities related to time or effort, environment-related opportunities, knowledge and information, and opportunities in terms of learning. The largest categories, which might indicate their significance, are participation and interaction opportunities and knowledge and information opportunities. Since some categories and sub-categories are the same as the opportunities identified for students by teachers, they are discussed together while making comparisons and contrasts between the two and still disclosing the different origins of the data items. This is done in line with the three major categories used to divide the various opportunities in Table 6: personal, social, and academic opportunities, with the addition of available opportunities. This categorisation was based on the previous literature. This study's findings revealed that CL encourages student engagement and satisfaction as well as learner interaction. Therefore, there is some evidence to suggest that student engagement increases student satisfaction, enhances student motivation to learn, reduces the sense of isolation, and improves student performance when CL is in application.

### **8.4.3 General opportunities of collaborative learning**

The general opportunities of collaborative learning discussed here cover the data gathered from both students and teachers on CL as a method, CL tools, and environment-related opportunities. Both students and teachers agree that CSCL is easier to implement than traditional non-CL methods of learning. It offers greater flexibility, for example, by allowing mistakes to be modified. This is in line with the argument that the benefits of CSCL are often at odds with lecture-style classrooms. CSCL offers students freedom to discover and learn at their own pace and level. This is more flexible than lectures, where students must learn at the same level and pace. When students are left to focus on their own mechanisms, they may find it easier to concentrate than when following a teacher's thought process during a lecture. Following a teacher during a lecture, students may not apprehend thoughts early, which can have an impact on their understanding of concepts later. With CSCL, students can review and explore concepts they did not comprehend before new ideas and learning. Finally, CSCL

affords a more expansive world to investigate than lectures. Students explore the internet and extra lessons when accomplishing regular assignments. Given this freedom, students can shape their time to find new interests in learning and the latest information about their world (CSC, 2020).

Nevertheless, CSCL is a relatively new method in Saudi Arabia. Therefore, more research is required to identify the comparative advantages and effectiveness of CSCL versus traditional teaching methods. Moreover, not all kinds of knowledge and student pools are choices for the CSCL environment. More ways in which students found CL easier are mentioned further, such as not requiring much teacher input, the lesson is structured and, therefore, easy to follow, making it easier to depend on others (see 8.4.4). Also, CSCL, specifically CSCL tools, support learning, making it easier and quicker to access information than searching in physical books (see 8.4.4) and remembering things (see Table 22).

Furthermore, the perception that CSCL is a ‘modern’ method can be seen as suitable for the current technological era. Teachers also noted that it helped students generate many ideas, made their lectures more informative, quickly led to highly effective outputs, and highlighted its similarities with brainstorming and constructive theory. Conversely, collaborative learning does not always function even if the appropriate tools are in use. On this point, to explore CL implications in the online distance learning environment, Appavoo et al. (2019) conducted research with 155 learners at the Open University of Mauritius. The study revealed that at least one third of the respondents were not participating in CL and were thus missing out on the benefits of “learning together”. The others had adopted CL to comprehend the course content, discuss assignments and gain better marks. This study also revealed that instructors’ role was fundamental in boosting learners’ motivation to explore CL. Respondents lamented the absence of suitable organisation and meeting places to hold CL meetings. They also recounted a dearth of awareness of CL benefits and difficulty in finding time due to family and professional commitments as some obstacles to CL. Saudi students at Hail University expressed the same arguments in the sense that both students and teachers acknowledged the benefits of CL learning. However, some cultural and pedagogical concerns curtail the learning effectiveness.

The teachers remarked on the opportunities for two CSCL tools, namely blogs and forums. They did not mention specific tools by name. Nonetheless, they examined the effectiveness of forums and brainstorming as tools while discussing their present experiences. Therefore, likening CL to brainstorming and attributing several opportunities of CSCL to the forum component are agreed by both parties. Although blogs have been covered in the literature review, forums have greater prominence, and a forum was also used during the primary research in the CSCL classes. Forums

have been used, for example, in studies by Caballe et al. (2011), Yucel and Usleul (2016), and Biasutti (2017). In Caballe et al.'s analysis, a forum was found to assist students in knowledge building and in teachers monitoring and evaluations. Yucel and Usleul found the tool helped students express themselves more openly.

Although Biasutti (2017) found wikis more useful for reaching a consensus, this study demonstrated that a forum has value in helping to discuss and share ideas. The identification of a forum tool is thus linked with the opportunities of CL facilitating discussions and visions or information sharing. However, teachers in the present study mentioned that it is also beneficial for submitting or presenting ideas. Brainstorming, as mentioned before, is an additional finding in this study, as it was not mentioned earlier in the literature reviewed. Sharing ideas, meanings, and conceptions is a core feature of collaborative learning (see 3.3), and Saudi students stand to benefit from managing their own group discussions (see 4.3.2). Forums could, therefore, be an ideal type of CSCL tool for Saudi students. This is also supported by Fini et al. (2005), who found that a forum is a great tool for generating knowledge in CSCL. This contrasts with the claim in Gao et al. (2013) contending threaded forums could hardly nurture productive online discussions. However, these are the types of discussion settings most used. They also noted that threaded discussions make it difficult for teachers to stimulate a focused and in-depth discussion. Accordingly, it is essential to plan alternative asynchronous discussion environments to improve online discussions quality.

The environment-related opportunities mentioned by the students were that CL creates a more effective atmosphere and helps prevent distractions. However, teachers did not share the same view about there being no distractions while students learn collaboratively. There were distractions in three of the four observed classes, the exception being Dr A2's CSCL class on a technical subject. The distractions in the other classes were in the form of side-talking, and, in one TCL class, the use of mobile phones during the lesson. Nooijer et al. (2021) acknowledged this potential of CL when creating a positive learning atmosphere but stressed the need for students to contribute towards maintaining it if CL is to be made effective. Unfortunately, no previous study was found in the literature reviewed to have examined the issue of distraction or disturbance in CL classes. The results of the present study are mixed. Therefore, it is uncertain whether this is an advantage or a problem. More research would be required on this phenomenon to determine whether CL can help prevent or cause distractions in class.

#### **8.4.4 Personal opportunities for collaborative learning**

The personal opportunities of collaborative learning discussed here cover the data from both students and teachers on personal effects, time-related opportunities, opportunities related to individual effort, the convenience factor, and opportunities in terms of students' attitudes and feelings. For example, the students pointed out that CL makes them more attentive, helps them gain new skills, supports their self-development in overcoming shyness and improving self-confidence, and makes it easier for them to depend on others. Concerning time, CL, particularly CSCL, helped the students save time and effort and eliminate books and sharing in libraries. Teachers noted the same convenience: CSCL overcomes temporal constraints and reduces the time needed to perform tasks. The convenience that it also overcomes spatial constraints allows for remote collaboration. The spatio-temporal advantages apply to CSCL specifically rather than TCL and are innate features or opportunities of this form of learning. These were noted under modes of CL deployment in section 3.6 and are not discussed further as distinct opportunities.

The capacity of CL to make students more attentive or focused on class is something that previous researchers, based on the literature reviewed, have not found, or mentioned. It could be an important finding in the present study, although an improved ability to reflect was found by Weller (2002). Similarly, Caballe et al. (2011) noticed improved skills that enhanced learning and knowledge building. Nonetheless, the present study sheds more light on a range of particular skills that CL helps develop. Other findings from the present study not mentioned previously in other studies include CL making it easier to depend on others and helping shy students to overcome their shyness. The potential for improving self-confidence confirms earlier studies by Ginns (2000), Chang and Windeatt (2016), and Shin et al. (2019), but helping to overcome shyness as another form of self-development, which teachers also mentioned under attitudinal effects, was not found mentioned in previous studies.

The time-related opportunities were confirmed in a previous study (Christopher, 2003), but, as mentioned before, other studies did not support this and claimed that time was wasted instead (Capdeferro & Romero, 2012; Almajed, 2015). This contradiction needs to be explained. It is plausible that CSCL is a type of CL that can save time if used with focus and waste time if there are distractions. The example given by students that CSCL can save time by searching through books online, which does away with the need to go to physical libraries, is also likely to be true. Further, according to Almajed (2015), time is usually wasted when there has been inadequate preparation. If the goals or objectives are unclear, there is insufficient information sharing, or some students are disinclined to learn.

In addition, the teachers pointed out several effects they noted in terms of changes in their students' attitudes and feelings, a few of which were mentioned by the students themselves. The shared perceptions are that CL makes their students more attentive and concentrated, improves their self-confidence, and helps the shy ones overcome their shyness by being more involved. All those have already been discussed above. Other attitudinal effects related to opportunities were noted by teachers but not by students. However, the greater enthusiasm was described by students as enjoyment when discussing their previous experiences, and motivation and fondness/liking as being more interested in learning, and they agreed that it promotes good competition. The remaining positive aspect is specifically and directly related to students' personalities. The students did not mention that CL builds their personality, makes them more positive overall, and immediately affects them. These positive effects were only noted by their teachers.

Improved enthusiasm, fondness and liking may be considered similar to the phenomenon of improved motivation. This has been confirmed in several previous studies (Johnson & Johnson, 2003; Chen et al., 2018; Warsah et al., 2021), but notably it is also contradicted in some others (Capdeferro & Romero, 2012; Turki et al., 2017). This shows that not all researchers agree on how CL affects students' motivation, but the present study supports those who suggest CL can improve it.

#### **8.4.5 Social opportunities of collaborative learning**

The personal opportunities of collaborative learning analysed here cover the data gathered from both students and teachers on opportunities related to participation, interaction, and team-working. Teachers noted that CL makes their students more cooperative and interactive, makes them feel included, gives all of them a chance, and encourages them to work together, leading to building concepts and solving problems together.

The students mentioned the points on student-student interaction, including team-working and teacher-student interaction. From the students' perspectives, the interaction among students during CL gives opportunities to all of them to participate and all of them do, including those who are shy, and helps them make friends. Moreover, they described the interaction as meaningful because it broadens their horizons, builds a spirit of cooperation, and improves it. It enables them to share and solve problems together, and the team-working that results helps break barriers. As with the spatio-temporal advantages of CSCL, interaction and communication are also inherent features of CL, but studies have also established the significance of improved interactive engagement (Almajed, 2015; Ghavifekr, 2020) and communication (Chang & Windeatt, 2016; Mahawan & Langprayoon, 2020) opportunities that occur because of collaborative learning. The building of "a spirit of cooperation"

is similar to what researchers such as Chang and Windeatt (2016) examined in the form of trust, mutual support and ‘community spirit’. Similarly, developing the ability to solve problems together was also found by Dignath and Büttner (2018) and team-working by Yu et al. (2013) and Retnowati et al. (2018).

However, the “broadening of horizons” as an impact of applying CL is an additional finding in this present study that was not previously examined in the literature reviewed. Various studies, however, have pinpointed that CL has countless advantages for young people in enhancing their soft skills, such as team building and communication, and in increasing self-esteem and confidence; and it is also hugely appreciated for permitting knowledge and information acquisition (Larson & Miller, 2011; Santos et al., 2019). In this regard, Atay and Karacan (2021) argued that paradigms in education had changed radically from the traditional transmission model to active learning based on experiences. As a result, learners are expected to acquire communication, collaboration, critical thinking, creativity, digital literacy skills, and knowledge in various areas as they prepare for the future workforce.

The students in this study perceived that CL enables them to reach the teacher more easily and work better with their teachers on the interaction between teachers and students. Attracting the attention of the teacher more easily is a major convenience for students, but this is attributable more to certain CSCL tools, such as the forum and social media tools, not to CL per se because CL is about learners collaborating while engaged in learning. This claim is supported by the PIE blog (2022), which states that “Edtech can also help to promote a more global outlook towards education, by removing borders as a barrier to sharing knowledge. Online learning can deliver standardised quality content at scale and enables educators to reach an almost limitless audience”.

#### **8.4.6 Academic opportunities of collaborative learning**

This section focuses on the academic opportunities of collaborative learning. It draws on the data gathered from both students and teachers on opportunities in terms of information, knowledge, learning, experience, and skills. Numerous potential opportunities were expressed by both parties, which all constitute academic or cognitive opportunities. These opportunities, according to the students, revolve around getting and developing information, obtaining and discussing ideas, information quantity and quality, sharing information quickly, remembering things more quickly or making it harder to forget, ease of learning, and positive impacts on understanding.

Teachers also acknowledged that CL supports learning, including self-learning and learner-centred learning; helps students learn together, including in the forms of team-working and peer-learning; improves certain abilities, such as concentration and understanding of ideas; and helps towards achieving learning objectives by making it easier to attain them in an improved way. In terms of knowledge, the teachers perceived that CL helps students gain knowledge, makes searching easy, facilitates sharing knowledge, and helps gain new perspectives. The students' and teachers' various knowledge and learning opportunities coincide and cover the same ground. However, the teachers also mentioned further opportunities regarding experiences and skills. CL improves students' communication skills, supports team-working, and helps acquire other skills in general.

Academic or cognitive opportunities is another domain in which several studies have been conducted previously. Most of them support specific learning opportunities, although one counter-study was noted in the literature review. A general positive effect on learning to make learning easier or more effective is corroborated in studies by Tsai (2011), Brennan (2020), and Stanley and Zhang (2020). The study by Dignath and Büttner (2018) was mentioned earlier, in which it was shown that CL could help students in problem-solving tasks. More notable and bold studies are those that claim CL can lead to higher-order thinking or the development of critical thinking (Chiong & Jovanovic, 2012; Warsah et al., 2021) and improved marks or grades (Tsai, 2011; Stanley & Zhang, 2020). No such findings were claimed in the present study, except for the opportunity presented by CL in building knowledge (Noorozi et al., 2013; Yucel & Usleul, 2016; Stanley & Zhang, 2020). More such studies were examined in section 4.2.3. The only counter-study, which was undertaken by Davies and Graff (2005), failed to find evidence for significant improvement in grades. This is understandable given possible confounding variables, such as the subject and students' abilities.

In addition, the opportunity for acquiring and sharing information provided by CL is supported by Almajed (2015), except that the present study also emphasised the potential of gaining quality information, and the same researcher (Almajed, 2015) found that CL also facilitates discussing ideas. The support for self-learning through CL may seem strange, but one of the two teachers who said this did so on the basis that teachers become facilitators to guide the education process. The same was also described as learner-centred learning. Students are learning together, or peer learning may be taken to mean the same as team-working and information sharing, both of which have already been discussed above. Similarly, the claim of improved concentration can be considered the same as improved attention or focus, which was identified above as an additional finding in this study. The impact of deepening understanding confirms the studies by Weller (2002), Siddiqui (2009), and Zhu

(2011). The potential knowledge gains, and ease of searching and sharing information or knowledge, are covered in previous studies, as already mentioned above.

The contribution of the present study on academic opportunities from the data obtained from students has been in pointing out the impact on memory whereby CL is claimed to make it easier to remember what has been learned. The remaining opportunities mentioned by the teachers are also additional findings in the present study, namely, that CL makes it easy and helps in achieving learning objectives; that it helps in gaining new perspectives, which can be considered as similar to what students described as helping to “broaden one’s horizons”; and that it helps in acquiring other (non-communication-related) skills in general.

#### **8.4.7 Summary of opportunities**

The four categories of opportunities or benefits are general, personal, social, and academic opportunities. Some very similar sub-categories are treated as the same. For example, all five sub-categories under ‘getting information’ mentioned by students are considered information acquisition. Some of the items across categories are also combined based on similarity. For example, cooperation, teamwork, sharing, and solving problems are treated together. Some ideas mentioned by both students and teachers that are similar are also treated together. For example, students noted that CL enables them to reach and work better with their teachers, and teachers described the same in terms of reaching out to their students. Many cases apply to CL generally, but to CSCL, and only to a lesser extent to TCL, such as CL allowing students to share ideas and express themselves more openly. However, these have not been distinguished and are classed as applying to CL generally.

### **8.5 Facilitators and Challenges**

#### **8.5.1 Collaborative learning challenges**

The findings from the research on challenges arising from the use of CL (barriers, obstacles, and hindrances) were presented in Chapter 7, section 7.7. Four main classes of CL challenges were identified from the data, as mentioned by faculty members: faculty members and training; previous experience; tools; and student-related reasons. A further three areas of challenges were identified as barriers for students: feelings and attitudes related to knowledge, skills, and experience; teachers; the environment; and tools. The main themes and sub-themes that emerged from the data on challenges of CL are presented in the mind maps in Figure 12 and Figure 13 in Appendix F.

For this discussion, the sub-themes were reclassified into the following four categories by combining those that were similar: institutional and general support, tools and devices, and teacher- and student-

related sub-themes. Four sub-themes are under institutional and general support: deficient or inadequate support from the institution; unsuitable curricula, lessons, or guidance; unsuitable environment; and lack of resources. Of these, issues related to instructional design and lack of technical support (Jung et al., 2012) and the classroom environment (Asino & Pulay, 2019) are acknowledged in the literature by other researchers (see Table 10), as with lack of resources and other items. An additional five sub-themes were recognised as tools and devices, lack of equipment or tools (including computers), some deficiency in them, distractions while using them, and network issues. Except for distractions, the other three pertain mostly to CSCL in which computers and other related tools are used, which are not required in TCL.

As a consequence of differences in economic environments and finances in different parts of the world, there are bound to be some institutions with a lack of equipment, tools, and computers, as found in the present study. One such case was examined by Fomsi and Njoki (2011), and the same is true for network issues. For example, slow connectivity was recognised as an issue by Muuro et al. (2014), among others, as may be expected. The same can also be said for deficiencies in equipment and tools, which participants in the present study reported. However, the literature reviewed does not mention such a case. As for the issue of potential distractions under CL, this is an area in which the present study has also made some findings. The researcher noted some distractions during the observations. The main challenges found in the present study were classroom related (see Table 21). The noises made by certain pieces of equipment and the unsupportive desks made the classroom environment unsuitable for CL. The indication was that if these distractions were not present, as in one of the classes (that of Dr A2), the students would be able to concentrate better and be more engaged in learning collaboratively.

Under the teacher-related sub-themes, an additional four items emerged: lack of teacher skills or training; lack of experience; lack of interest or incentives; and too great a workload or lack of time. Lack of skills among students has been examined, for example, by Le et al. (2018). Some teachers also had the same problem, particularly in using computer-based CL tools and incorporating them to support collaboration among their students (Orehovacki et al., 2009). Liu et al. (2010) and Muuro et al. (2014) mentioned the lack of time that teachers must also deal with. Almajed (2015) found the same issue of limited time and a heavy workload among students. However, the literature review did not uncover a lack of experience and interest in CL among teachers.

Student-related sub-themes formed the largest category, under which nine sub-themes were classified. Some of the psychological issues faced by students have been examined in previous

studies: Jung et al. (2012) examined stress among students, caused, for example, by unclear directions, technical issues and having to wait for other students to respond; Cabble (2010) and Capdeferro and Romero (2012) examined students' frustration in communicating and working in groups; and Godat (2012) discussed the problem of lack of confidence among students. The related area of moral issues is one in which the present study highlighted that some Saudi students feel concerned over their pride and sense of ethics. The older faculty member who mentioned pride among students said it made some of them reluctant to participate because they did not want to be seen as weak. For example, in case they replied wrongly in class. Those students' ethical concerns were over being mocked in front of other students. Finally, the phenomenon of resistance to CL among students was examined by Yusop and Abdul Basar (2016). They found that individual factors, such as anxiety and lack of commitment, and technical issues, such as internet connection, caused students to resist using CL.

Furthermore, in a different context, which revisits the influence of Saudi culture on Saudi students in US universities, Razek (2013) demonstrated the pressure that Saudi students face in projecting their image as Arabs and Muslims. As a result, Saudi students become anxious about their attitudes and what they say in the classroom. Razek (2013) continues this argument by stating that "aware of challenges that face international students, college administrators and academic departments often initiate support systems to help these students adjust to their new context and achieve their desired educational goals". These precautions mean that Saudi students examine carefully what the whole student body, professors, and professionals reflect upon them as collectivist individuals. They do not view it personally but as something that speaks about their group in the United States, their country, and their religion.

In addition to moral issues, the remaining are further findings of this study: lack of attention among students, related to distractions, and some students not being convinced and preferring non-CL methods because they fail to see how CL offers anything better. This finding should be interpreted in conjunction with the related finding, which contradicts the notion that some students find it easier and more convenient to adopt CL.

### **8.5.2 Collaborative learning support**

The findings from the research on the support of CL were presented in Chapter 7, section 7.8. Two main themes were identified from the data related to support: strengths and shortcomings in the provisions and support. In addition, the main themes and sub-themes that emerged from the data on definitions of CL are presented in the mind map in Figure 14 in Appendix F.

The data identified five strengths and six shortcomings of the provision, support for, and receptiveness towards CL. The strengths were educational resources, educational means, software, the internet, and computer laboratories. The shortcomings identified were related to desktops, the internet, laptops provided by the university, training, implementation controls and mechanisms, and not caring about students. It may be noted that computers or computer laboratories and the internet are mentioned under both. This reflects a situation of non-uniformity in the arrangements for CL between classes. Although the provision of computers and the internet is acceptable in some classes, it is deficient. The ‘educational means’ described in the data refer to the provision of equipment and tools, including computers, which can be considered the same as resources, and computer laboratories are educational resources and means. The internet and CL software are also essential requirements for CSCL, as a computer alone is not enough. All these factors enable CL to be possible. Beyond these, as mentioned in section 4.4.3, educational resources used during CL, or CSCL particularly, typically comprise text documents and audio/video resources, and educational videos are proving especially useful (Leijen et al., 2020).

In addition to issues with computers and the internet, which can also be shortcomings if not provided adequately or if they have some deficiencies, the other weaknesses identified were training, implementation controls, and not caring about students. Lack of or inadequate training is evident from the lack of training and skills noted under drawbacks in the previous section, which Orehovacki et al. (2009) observed as well, and which Quackenbush (2020) stressed; that is, providing training to ensure the CL is effective. By “*implementation controls*”, the teacher who pointed this out referred to mechanisms in place that support the implementation of CL in terms of institutional support, including training. In other words, the teacher stressed the importance of this support for the CL provision to be effective. Lack of institutional support for CL in Saudi Arabia was identified by Asiri et al. (2012) and Alhomod and Shafi (2013). Although these studies were conducted a decade ago, the present study suggests the need for more institutional support, which implies that such support is currently inadequate.

### **8.5.3 Collaborative learning facilitators**

The findings from the research on facilitators of CL were presented in Chapter 7, section 7.9. Three main groups of facilitators were identified from the collected data: those at the university, the teacher, and those on the part of students. They were then divided into those applied before and used during the collaboration. The main themes and sub-themes that emerged from the data on CL facilitators are presented in the mind maps in Figure 15, Figure 16, and Figure 17 in Appendix F.

Both groups of participants identified numerous facilitators of CL in the present study. These were classified into 15 main categories: university, training and counselling, teacher related, grouping, environment, furniture and equipment, devices and tools, materials and resources, other arrangements, tasks and roles, information and planning, encouragement and motivation, guidance and supervision, learning, and reporting and feedback. For this discussion, closely related categories were then combined to form the following six:

- Teacher-related – teacher-related sub-themes.
- Training and counselling – training, counselling, guidance, supervision.
- Equipment, tools and resources – furniture, equipment, devices, tools, materials, resources, technical support.
- Environment, grouping, and tasks – environment, grouping, tasks, roles.
- Encouragement, guidance, and information – university, information, planning, encouragement, motivation.
- Learning, reporting, and feedback – learning-related, reporting, feedback.

Three teacher-related facilitators were identified in the data: teachers' attributes, their knowledge of the technology and topic, and their skills and experiences in managing discussions. The present study adds evidence to support the importance of teachers' beliefs, particularly in the usefulness of ICT (Dias et al., 2014). However, the other attributes of personality and dress, which are also considered important in the data gathered, are additional findings that were not referred to by previous studies examined in the literature review chapter. This might suggest their importance is peculiar to Saudi culture and other similar cultures in which teachers' personalities are observed closely and treated as important to follow. Teachers' knowledge of the technology and topic are more findings from this study that need to be discussed. Gebre et al. (2014) established the importance of teachers' perspectives but forming a view would depend on having some knowledge and information in the first place. Irrespectively, these would be expected because the more knowledge a teacher has of CL and how to make it effective, and the lesson's topic, the more favourable the outcome of the lesson. The present study confirms other skills and experiences of teachers, but in respect of managing discussions. In contrast, several more skills were mentioned in previous studies, including 'teacher scaffolding' and maintaining an online presence.

The present study's finding regarding training and counselling supports their importance, as was expressed in the literature reviewed for both teachers (Quackenbush, 2020) and students (Dias et al., 2014). The data contributes to the field by adding areas in which training is essential. For students,

this means training them in being motivated and using certain devices and tools that support CL. For teachers, they are in using computers and on how to encourage students and help make them collaborate and engage in discussions. The details make these contributions to the present study valuable because they were not found in the literature reviewed. All these areas pertain to CL generally, but the training in using computers is specific to CSCL. In addition, there are more findings related to training and counselling that are also considered important for facilitating CL: typing skills for students, arrangement of workshops, and counselling or teacher mentoring provided for students to help them deal with the challenges associated with CL. Typing skills for both teachers and students can be considered essential. The quicker and more accurately they can type, especially during live discussions and chatting, the faster the discussions can progress. Similarly, recourse to dealing with challenges can help overcome those challenges, thereby ensuring the CL is effective.

Equipment, tools, and resources are an area in which there are mixed findings regarding whether similar results were previously examined in the literature reviewed. The present study confirms the usefulness of providing adequate tools (Jeong & Hmelo-Silver, 2016; Zanjani et al., 2016), although the teachers in the present study specified equipment such as projectors and smartboards; providing materials and resources that specifically support learning (Overdijk & van Diggelen, 2008); and showing short videos, to which Dillenbourg et al. (2009) and Leijen et al. (2020) added visual and other representational tools. These findings substantiate the studies examined, but the data in the present study shed more light by adding more details. These details include a larger variety of tools to support CSCL, including computers and other essential hardware and software, including certain web-based tools. The various hardware and software components are used together to provide the overall CSCL experience. Similarly, Jeong and Hmelo-Silver (2016) and Zanjani et al. (2016) highlighted the importance of affording adequate tools to support CL, but the data in the present study stressed certain qualities. Those tools must be new, easy to use, effective, and support student interaction and discussion.

A couple more findings were not found in the literature reviewed, but they could be expected. For example, students need internet access with sufficient speed and reliable connections and technical support to deal with situations when things go wrong and prevent them gaining access in the first place. There are two additional findings in the present study: the need for well-designed classroom furniture and the need to provide students with cabinets. Both are aspects of the classroom environment, which was shown earlier to be an important factor in the successful implementation of CL based on the observation data. Although these may not be considered essential for CL, a few

teachers mentioned these as necessary to provide an overall “*supportive environment*” for the university (see section 7.8.1).

Most of the findings classified under environment, grouping, and tasks are confirmations of those in previous studies. Asino and Pulay (2019) and Nooijer et al. (2021) also emphasised the importance of providing a positive learning environment. The participants of the present study mentioned that classes should also be equipped with air conditioners. This is understandable, due to the hot climate of Saudi Arabia. Air-conditioned classes make them comfortable working environments, without which CL would be impeded. A comfortable classroom environment can affect all kinds of learning and is not peculiar to CL. To reiterate, the observation data in this study established the importance of this environment. This makes it worth emphasising the environmental factor.

Class size is another important factor, and previous studies confirm the same. Sadeghi and Kardan (2016) recommended small classes, Qiu et al. (2012) recommended no more than 13-15 students per class, and Bruffee (1993) advised no more than five students in each group when a class is divided into groups. One teacher in the present study justified small groups because it would be “*more wonderful and help more*”. The recommendation of 5-6 students is roughly in agreement with Bruffee’s (1993) suggestion, although another teacher stated having not more than 12. Assigning multiple tasks and roles by devising clear and specific goals confirms the importance of practical tasks, and sequencing them confirms studies by Kirschner et al. (2009), Godat (2012), and Jeong and Hmelo-Silver (2016); the need for good organisation in terms of objectives and coordination confirms that of Nooijer et al. (2021), who stressed the importance of giving students a shared goal to work towards.

The evidence derived from this study highlights the importance of arranging small groups and ensuring they are balanced, teaching with clarity, and arranging for appropriate displays using posters and suitable lighting. Notably, different teachers have different ideas of the right ‘balance’. One teacher believes students should be at the same level without “*disparity in scientific capabilities*”: in other words, for groups to be homogeneous. In contrast, another justified the need for heterogeneous groups to facilitate CL by including a combination of “*excellent students and lower-level students*”. This contrast was highlighted in section 7.9.2.1. More research would be required on forming ideal groups for CL because these differences of opinion are also reflected in the literature. For example, Bruffee (1993) recommended that groups not be too homogeneous, whereas Korkmaz (2013) suggested that they be homogeneous. The idea of creating a competitive atmosphere among students might seem strange in a CL context, but this was discussed earlier under present experiences by

relating it to cultural differences. Zhu (2011) showed that Chinese teachers share the same feeling, but not Flemish teachers. As for appropriate displays, the connection with CL could be that Saudi students look around for cues to help them learn and discuss.

The category of encouragement, guidance, and information has additional findings. The data collected confirm four facilitators, of which two are partial, and contributes by identifying seven more facilitators. The two confirmed facilitators are encouraging or motivating students, or giving them incentives to participate (Liaw et al., 2008; Cowan & Astall, 2010; Zanjani et al., 2016), and monitoring or supervising the students while they collaborate (Jeong & Hmelo-Silver, 2016; Nooijer et al., 2021) and engage in discussions (Geiss & Roman, 2013). The partial confirmations were on ensuring control and guidance, which is true for discussions, and planning in general (Liaw et al., 2008; Zanjani et al., 2016; Nooijer et al., 2021). The present study adds to these by recommending wider control and guidance and planning to take on a more strategic form.

One teacher described the need for “*implementation controls and mechanisms*” combined with evaluation at an institutional level that incorporates training (see 7.7.2). Another considered it critical so that teachers can “*distribute their ideas and direct their ideas*”, otherwise “*there is no need to use the method of collaborative learning*” (see 7.9.2.2). The term ‘strategic planning’ was not used by any participant, but one teacher recommended viewing CL as “*a strategy*” that would save time for teachers (see 7.8.2.1 and 7.9.1). In other words, it was recommended for teachers to arrange CL for students in a way that helps save time for themselves. Irrespectively, as with creating a competitive atmosphere, this suggests another cultural pressure to adapt the practice of CL rather than to adopt it as a student-centred and constructionist form of learning. Too much control and formality could be counterproductive to CL, and it goes against the recognition by other Saudi teachers interviewed of facilitators. However, if Saudi culture accommodates this modern form of learning on a wider scale, some adaptations may be necessary, particularly shyness and power distance.

Three additional findings on CL facilitators suggest this could be the case: lecturer intervention, modifying or adapting the information the students obtain through their collaborative efforts, and giving students clear and understandable information before their collaboration. It was recommended that teachers intervene during the collaboration and either ensure the students obtain the right information or give them detailed information beforehand, rather than letting them reach it through their own efforts. However, the teacher who suggested the third facilitator expressed the need to ensure students understand the topic, given the lack of teachers to clarify and prevent misunderstanding. The remaining four facilitators, which may be interpreted as essential

recommendations, were not found in the reviewed literature: the university should give incentives to students and encourage them to engage in CL; teachers should give inspirational stories to their students to motivate them; instil a “*spirit of collaboration*” among them; and give them opportunities to ask questions in the group and have their own mistakes ‘fixed’.

Under the last category of facilitators, the importance of feedback is well established in previous studies (Janssen et al., 2007; Forment et al., 2010; Guasch et al., 2013; Muuro et al., 2014; Alammar, 2017; Nooijer et al., 2021), which the present study also confirms. Likewise, the value of following up on student performance through evaluation is established by Zheng et al. (2015) and Zanjani et al. (2016). However, the present study has contributed by showing the importance of adopting learning standards, embracing a diversity of learning methods that involve students further in support of their own learning, homework, and generating reports of CL sessions. The other learning methods mentioned in the data and recommended to be applied along with CL were peer learning, role-playing, and brainstorming (see 7.4.4.1). One teacher suggested that students interact and discuss their homework (see 7.5.1.5). By ‘standards’ was meant not only foreign standards, but also generally accepted norms, and teachers themselves set standards for their students (see 7.8.2.1).

#### **8.5.4 Collaborative learning prospects**

The findings from the research on the future prospects of CL are presented in Chapter 7, section 7.10. The data identified two main prospects: prospects for CL at the university and CL outlook in Saudi Arabia. The latter was divided into generally positive outlooks, significantly positive outlooks, main drivers of the changes, and mixed or uncertain outlooks. The main themes and sub-themes that emerged from the data on prospects of CL are presented in the mind map in Figure 18 in Appendix F.

The participants in this study added to the data by giving their perspectives on the future outlook for collaborative learning at the institution investigated and in Saudi Arabia generally. They also identified several main change drivers behind the developments. Some outlooks were general, some expressed a significantly positive outlook for the kingdom, and a few were mixed. When detailing the context of the present study in Chapter 3, it was noted that Saudi students have become more accustomed and receptive to CL over the years (Alammar, 2017). However, there are still some students who prefer F2F learning (Al-Ismaiel, 2013), which would include TCL but not CSCL, and some issues with CL persist, such as lack of interaction (Alkhalaf et al., 2013), technological difficulties (Al-Ismaiel, 2013), and lack of organisational support (Alhomod & Shafi, 2013). Perhaps due to these kinds of issues, Alrazgan (2015) and Alshammari et al. (2016) reported underutilisation

of CSCL tools in Saudi HE institutions. We know from the present study that this is not the case at Hail University, in which CSCL is applied as early as the foundation year.

Other than what is mentioned in the above paragraph, the researcher did not come across any further findings specifically on the future outlook for CL in Saudi Arabia, let alone one conducted at the selected institution. Therefore, additional results in this present research shed new insight into the prospects for CL in these two contexts. At the chosen institution, the teachers accepted that implementing CL more widely would take time and acknowledged several aspects of potential, but they were hopeful it would continue to be applied. The possibilities they identified were the ability of CL to help low-performing students, save teachers' time, and enable certain students to express themselves and overcome shyness. Another potential that applies to CSCL only is recognising that it can provide "faster and easier" access to information. These are all potential opportunities for CL. The time-saving potential and capability to help students express themselves confirm previous studies and are listed in Table 21 on CL opportunities identified in the gathered data, but the potential to assist weaker and shy students is, as mentioned before, a new finding not previously examined in the literature review.

The outlooks described for the kingdom are also positive, and some were classified as significantly positive. The teachers perceive that the adoption of CL will continue to be applied and will expand further and that there will be a new generation of students with a higher level of communication skills. One teacher described using CL as an extension of the body. The more significantly positive outlooks were seeing the use of CL expand greatly, considering it, along with e-learning generally, as the future of education, that there will be greater reliance on this form of learning, and seeing it as necessary for the Saudi Vision 2030. Given Alshammari et al.'s (2016) assessment that CSCL is being underutilised, which was made eight years ago, the findings that emerge in the present study paint a more optimistic picture for Saudi Arabia.

The teachers perceived several changes to be behind the growing adoption of CL in the kingdom. The main ones they identified are the 'digital transformation' under way, in which CSCL specifically is perceived to be a part of the efforts being undertaken nationally to achieve the Saudi Vision 2030, and the pressure to follow trends set by internationally respected universities. It was noted in section 2.3.4.1 that one of these trends is the adoption of CL and blended learning at the forefront of educational technologies. However, three points emerged that counter the positive outlook, which must be overcome for CL to be adopted widely in the kingdom. First, the teachers recognise the need for correct marketing to deploy CL, propagating awareness of its advantages, and encouraging the

remaining universities still not using CL to adopt it. Given the prominence of technology and technological advantages in the data gathered for this study, the teachers envisaged CL as CSCL rather than TCL.

Collaborative learning has been found to be a beneficial approach towards improving the educational and psychological well-being of learners. Drawing on cognitive theory, CL enables learners to better understand concepts and learn new constructs in collaboration with other group members (Shi et al., 2021). In addition, social constructivism theory highlights the importance of creating a social platform before knowledge, with sustained social interactions enabling learners to engage collaboratively in their activities (Alqurashi & Alshareef, 2019).

The case study of collaborative learning among preparatory year students and their teachers at Hail University in Saudi Arabia provides a valuable example of how constructivism, social learning, and cognitive learning theories can be applied in an educational context. Constructivism emphasizes the importance of the learner actively constructing their own knowledge and understanding through interactions with their environment. In this case study, the collaborative learning approach allowed students to actively engage with their peers and teachers to build their understanding of course content.

Social learning theory suggests that individuals learn through observing and imitating the behaviours of others, and through social interactions. In the case study, collaborative learning allowed students to observe and learn from their peers, as well as their teachers, through group discussions and activities. This provided opportunities for students to share their perspectives and ideas, and to learn from each other's experiences.

Cognitive learning theory emphasizes the importance of mental processes, such as attention, memory, and problem-solving, in learning. Collaborative learning in the case study provided opportunities for students to engage in activities that required critical thinking, problem-solving, and information processing. Through collaboration, students were able to develop their cognitive skills and apply them to real-world situations.

Overall, the case study of collaborative learning at Hail University highlights the benefits of incorporating constructivism, social learning, and cognitive learning theories in educational practices. By engaging students in collaborative learning activities, educators can promote active learning, social interaction, and cognitive development among students.

However, it is also important to consider the impact of culture on CL in Saudi Arabia. A study by Alharbi and Al-Mekhlafi (2019) found that cultural dimensions of power distance and collectivism can affect CL in Saudi Arabia. Power distance in particular can curtail the intended process of CL, as it affects the differences between teachers' and students' roles in collaborative teaching. Meanwhile, collectivism can have an impact on student satisfaction and academic performance, as students still require guidance from teachers. These theories have been applied in the context of Hail University in Saudi Arabia, where cultural factors such as power distance and collectivism have been identified as having an impact on CL (Alkathiri & Al-Gahtani, 2021). Teachers have recognised the importance of creating a social platform for learners before knowledge, which is essential for CL to be effective in this cultural context.

Therefore, understanding the cultural factors that influence CL is crucial in implementing effective teaching and learning strategies in Saudi Arabia. By recognising the cultural dimensions that affect CL, educators can tailor their approach to better suit the needs and expectations of learners in the region.

## **8.6 Answering the Research Questions**

This chapter has provided an in-depth discussion of the findings. It linked those findings to previous and recent studies to answer the research questions and achieve the main objective that this study endeavours to realise. It started with the definitions that both the teachers and students provided of CL. It then discussed the CL opportunities for both the teachers and students.

In addressing RQS1 – How is collaborative learning deployed and practised in the preparatory year of Hail University? – it was crucial to test the meanings in CL in Saudi Arabia. From the meanings that both teachers and students ascribe to CL, even if they vary, it was clear that the ways they understand CL have the same interpretations as were found in the literature review. In addition, CL in Hail University exists, but has two modes: the first is linked to the TCL, which is a traditional system of learning in a collaborative way; the second mode, however, involves the use of technology and is termed CSCL. Both modes are used in the teaching and learning processes.

In terms of RQS2 – What are the perceptions of students and teachers at Hail University towards collaborative learning with and without the use of CSCL tools? – participants identified that CL has changed how they learn or teach. For students, working as a team has enhanced their cognitive, social, and academic skills. For the teachers, CL has reshaped their attitudes towards their students as power distance is much reduced. In addition, teachers feel the added value that CL has provided for learning

and teaching methods. However, TCL did not give either teachers or students promising opportunities to increase speedy learning or enhance teaching style.

As far as RQS3 – What are the experiences of those students and teachers at Hail University who use CSCL tools for collaborative learning? – is concerned, students' and teachers' past and present experiences using CSCL tools for CL demonstrated that CSCL tools indeed facilitated the learning process for students and the teaching method for teachers.

Finally, RQS4 – What factors assist or hinder traditional and CSCL among students? – the practices and effectiveness of both TCL and CSCL are curtailed by various barriers, such as shyness, the settings in which CL is taking place, as well as the cultural aspects of the country, such as a power distance that manifests itself in the relationship between teachers and their students.

Finally, outliers in research should not be ignored or simply removed without careful consideration (Tukey, 1977). They may provide valuable insights into the data and the phenomena being studied, and their presence may indicate the need for additional analysis or investigation. However, upon conducting a comprehensive investigation, the researcher concluded that the presence of outliers did not provide any useful insights or indicate the need for further analysis or investigation. Therefore, the decision was made to eliminate these outliers from the data set. This was done to ensure that the analysis accurately reflected the trends and patterns in the data, without being skewed by the presence of outliers that were not representative of the larger population. By removing the outliers, the researcher was able to focus on the data points that were more representative of the overall trends and draw more accurate conclusions from the analysis.

## **8.7 Summary**

This chapter presented an analysis and discussion of the findings. Based on the answers to the research questions, CL in Saudi Arabia is still working its ways to full implementation. The meanings of this new style of teaching and learning are no different from the definitions provided in the literature review. Moreover, CL exists in Hail University, but in two different models: TCL and CSCL. Nevertheless, CSCL has resonance but is contested by its counterpart TCL, which seems to dominate the educational platforms. From the experiences of teachers and students in this study, CSCL tools help in the process of teaching and learning, but CL faces various barriers. The efforts for CL to be fully effective, to increase its benefits, and minimise its drawbacks are not interpreted in reality.

The next chapter provides a general conclusion for this study before it indicates its limitations and then makes recommendations that could be effective in helping the development and application of CL at Hail University specifically and in Saudi HE generally.

## **CHAPTER 9 - CONCLUSION**

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### **9.1 Introduction**

This chapter concludes the study, which had the aim of investigating how collaborative learning used for teaching and learning activities is deployed, perceived, and experienced by a sample of students and their teachers at a selected university. The chapter starts by briefly revisiting the main objectives that the research was intended to fulfil. It then summarises the methodology applied in the study and the findings that resulted from the investigation. Afterwards, it states the implications that emerged from this research study for teachers, students and other stakeholders, and policymakers before moving to indicate some of the limitations of this research. It then offers recommendations to enhance the application of CL and areas for further research.

### **9.2 The Main Objectives**

This study relied on four sub-objectives and related research questions to guide the primary research and help achieve the main objectives, as explained in Table 1 in section 1.5.2. The first objective looked at the deployment and practices of CL in the preparatory year at Hail University in Saudi Arabia. This investigation outlined two modes employed at the university, namely TCL and CSCL. Both sets of participants described the practices of CL as reported throughout the findings, but section 7.7 and section 8.2 in particular provide a thorough discussion of these findings.

The second objective explored the perceptions of students and teachers at Hail University towards CL with and without CSCL tools. Again, the focus groups and interview sessions gave both sets of participants ample opportunities to describe their perceptions. The data on perceptions were reported throughout the findings chapter, but assessments of the future prospects of CL were documented in section 7.10. The findings were then discussed, particularly in terms of opportunities or benefits, in section 8.4 in the discussion chapter.

The third objective investigated the experiences of those students and teachers at Hail University who specifically use CSCL tools for learning collaboratively. The students described their experiences of using CSCL in focus groups, and the teachers did the same during the interviews. These findings were reported in the findings chapter in section 7.5, and discussed in section 8.3 of the discussion chapter in respect of the literature reviewed.

The fourth objective identified and examined factors that may assist or hinder TCL and CSCL among students. The students and teachers in this study identified several such factors, which are reported in the findings chapter in sections 7.7 and 7.8 and discussed together in the discussion chapter in section 8.5.

### **9.3 Applied Methodology**

As this study investigated the perceptions and experiences of students and teachers regarding CL, it relied on a qualitative research method. The method used suited this study because the focus was mainly on the subjective perceptions and experiences of the participants. The qualitative data had to be interpreted to portray the socially constructed reality of CL at the selected institution. The assumptions underlying this paradigm, outlined in section 6.3, were upheld. The students' interpretations and experiences of CL were tied to their own engagement in learning collaboratively, and the same was the case for teachers who guided and instructed their students. Previous experiences were prominent in shaping their perceptions and perspectives. Furthermore, the meanings presented in this paper had to be derived from the data describing the participants' social interactions. The inductive process did not lead to developing a theory, but that was not the purpose of this study.

For this purpose, a case study was arranged at Hail University to research teachers' and students' standpoints in the preparatory year under an interpretivist paradigm and inductive process. Data for achieving the above objectives of the study were collected from a discussion with a group of 30 students, observations of four classes, six focus groups with students, and individual interviews with 12 teachers. The case study nature of the design was also a wise decision because it enabled focusing on a particular institution and within its natural setting, which gave authenticity to the data. This was especially true during the classroom observations, as what the participants said could be compared with what was observed. For example, disruptions were noted as 'notable behaviour', such as using mobile phones by students, which neither students nor their teachers mentioned themselves. This example also shows that adopting multiple methods was useful for comparing the data because some information was only revealed through one method and not others. There was no disruption to the participants during the observations, which had been identified as a potential concern.

Generalisation is another issue with case studies, as the findings are not usually generalisable and thus transferable. The insight gained in this study at the expense of the generalisability of the findings was valuable. However, some scope for generalising is possible, as examined in 6.5.2. This would assume that university classrooms elsewhere in Saudi Arabia are similar to those investigated in the present study. Cohen et al. (2018) described this situation as resonance. The collectivist nature of

Saudi culture supports the possibility that most other higher education contexts in the kingdom will be similar.

The researcher's standpoint revolved around the fact that he belongs to the same cultural context, religion, and nation as the participants. He is a native Arabic speaker and worked as a lecturer at the selected institution. As mentioned, this made him both an insider, due to acquaintance with some of the staff (not the students), and an outsider as an independent researcher. Potentially, this was a challenge to avoid introducing bias and remain neutral, but it was an advantage in practice. The similarity in the background made it helpful to relate to the participants and understand their perceptions and perspectives. In addition, it enabled the data collection to be conducted in the native language of the participants. By conducting the focus group sessions and interviews in Arabic, the participants felt more comfortable and spoke more openly and confidently than they would have done in English. Their responses were then translated into English for reporting in this study. Although this added to the data collection and analysis time, it was a major factor in acquiring rich data and insight.

The data obtained mainly from the focus groups and interviews were analysed using thematic analysis before synthesising the findings (see section 7.11). These focus groups and interviews provided the main in-depth insights into this study. In addition, the detailed information acquired from the participants was also facilitated by the format in which it was gathered, that is, from the adoption of focus groups and interviews in the research design. These two methods allowed for interacting directly and confidently with the participants, which would not have been possible if a survey had been conducted. The direct interaction allowed the researcher to ask follow-up questions and clarifications and enabled the participants to explain what they said in more detail. The sequence was also suitable because conducting the interviews at the end permitted discussion of what had been observed.

## **9.4 Summary of Findings**

CL at the selected institution was practised in two modes: TCL, a traditional method without computers or any technology; and CSCL, in which computer-based devices were used. As discussed in the relevant chapter, numerous findings made in similar previous studies in the literature were confirmed by the data in the present study. A few examples of notable confirmations were that CL improves self-confidence and encourages students to express themselves. However, the study also confirmed for the Saudi context that institutional support for CL is generally lacking; the lessons, curricular, and environment can by and large be seen as unsuitable. There is also a lack of equipment, including computers and network issues (see Table 22). Teachers face problems, such as lack of

training, too heavy a workload coupled with lack of time, and some students experience problems such as a lack of interest or demotivation and lack of confidence. As for facilitating factors, the study confirmed earlier findings, such as arranging small groups in a supportive classroom and assigning tasks to them and giving students suitable learning materials (see Table 23).

Some of these findings may be perceived as expected, despite not being confirmed. For example, CL is seen as facilitating communication, interaction, cooperation, and sharing knowledge and ideas (see Table 21), despite certain challenges, such as lack of resources (see Table 22). Nevertheless, potential academic benefits support the case for arranging and promoting CL. These included CL facilitating information acquisition, supporting learning, and strengthening understanding (see Table 21). Other expected facilitators found were the availability of computer labs, internet access, and technical support for CSCL (see Table 23).

In addition, some findings added more detail to similar results in previous studies. For example, concerning facilitating factors, the present study shed more light on providing tools to support CL and its adequacy. The required features for tools were that they were easy to use, effective, and capable of facilitating interaction and discussion (see 8.5.3). Another category of findings contradicted previous findings on the same matter or issue. For example, CL has been linked to improved motivation in this study. As discussed in 8.4.6, although this is in accordance with some previous studies, such as Warsah et al. (2021), it also contradicts others, such as Turki et al. (2017). However, there were no clear contradictions. The contribution here is in showing cases where the findings did and did not apply.

Three types of findings challenged the internal consistency of the data. Firstly, the findings that CL both saves and wastes time. This was explained by CSCL saving time, for example, when the need arose to search for information, and wastage can occur, for example, if the objectives are unclear and preparation is inadequate. Secondly, it was found that CL can improve students' attention and distract them. This is discussed in section 9.5.1. Thirdly, there was a contrast when some teachers advised the heterogeneous grouping of students, but one would prefer homogeneous groups. Those who declared for the former did so because mixed-ability students can help one another. On the other hand, the one who advised students in a group to be at the same level believed it would be easier to organise and work as a team.

The present study obtained some findings not noted earlier in the reviewed literature. For instance, CL helped some students to overcome their shyness and learn to depend on others. This is particularly important for the potential learning benefits. For example, both teachers and students mentioned the

capability of CL to help students acquire new skills, make students more attentive, help them gain new perspectives, as well as helping them remember more easily and learn together (see Table 21).

Things that facilitated CL were adopting learning standards and methods and doing homework through peer-learning and report-making activities (see Table 23). Other enabling factors found included lecturer intervention, imparting information to students to guide them, encouragement, inspiration, and giving opportunities for students to ask questions. More such factors were related to the grouping of students and the environment, such as arranging balanced groups, clarity in teaching methods, and setting a competitive atmosphere.

The teachers in the present study mentioned that CL can help them achieve their students' learning objectives and be effective in delivering audio-visual resources, the latter especially through implementing CSCL. In addition, the present study found that students stand to benefit greatly by having typing skills and from the arrangement of workshops and counselling for them.

In terms of challenges, the study highlighted personal moral issues among Saudi students, such as pride and credibility, and a few not being convinced and preferring non-CL methods (see Table 22). In addition, the teachers themselves were challenged by a lack of experience and of incentives in adopting CL practices, and distractions in class were evident during the observations. This entails the quality of collaboration indeed depending on the positive personal morals of the Saudi students under study in the sense that it enhances the levels of learning when such morals are high. On the other hand, CL does not function or yield significant outcomes when teachers lack the experience to make it a success.

## **9.5 Contributions**

The present study has contributed to knowledge on CL in higher education institutions, particularly in the Saudi cultural context. The present study's major contribution was in those key findings highlighted in the synthesised discussion in section 7.11. These findings stood out because they were emphasised or mentioned by several participants or because they were original findings peculiar to the context of the study. They were related to attention, shyness, power distance, CL through traditional learning methods, and the CL tool of choice (see sections 7.11.1 to 7.11.5). The findings suggest that Saudi students could benefit from the potential improvement in their attention, that is, by becoming more attentive during CSCL. This should be seen in combination with the importance of a distraction-free environment and the role of motivation in ensuring attentiveness.

### 9.5.1 Contributions to CL practices in Saudi Arabia

The potential for overcoming shyness is a key finding that Saudi educators should note, as discussed in section 7.11.2. The reason for its potential to help such students, as explained by one teacher, is that it removes the negativity associated with students commenting on each other and thereby “*breaks the shyness barrier*”, as another teacher put it. Another feature that CL tends to ‘break’ is the traditional power distance, which remains pervasive in Saudi culture despite the expression by many participants that CL is superior to traditional learning methods (7.11.4). Whether this is an effective feature has not been discussed in depth but reducing the power distance by offering CL provides Saudi students with more learning opportunities. For instance, it allows students to learn from their teachers and collaborate with their fellow students. It also offers remote cross-gender interaction, which is not permitted in a non-F2F setting. As for a tool of choice, participants were not asked to express their choice or rate different CL tools, but a forum was mentioned in common among other tools. The reason for this is its good support for discussions and its effectiveness in an asynchronous setting (see 7.8.1).

Another area of key findings was the useful comparisons drawn between the responses of teachers and students and between TCL and CSCL (see section 7.11.6). The key similarities and differences in the two sets of reactions are noteworthy for highlighting the extent of the harmony and the potential for opposing views, disagreements, or conflict, and the comparisons between TCL and CSCL drawn from the data could be useful for deciding which of the two forms of CL to adopt and promote. The teachers and students agreed on the attitudinal benefits of CL and the potential for improving students’ confidence and attentiveness and overcoming shyness. This further reinforces the importance of these potential benefits. Policymakers could regard them as being perceived as opportunities by both teachers and students.

The minor differences between teacher and student responses reveal variations in emphasis and perspectives. Students focus on learning opportunities and teachers on teaching opportunities, which may be expected, as teachers are generally more aware than students of CL opportunities and challenges. In comparison, the focus of students tends to be narrower. For example, the teachers observed positive personality changes in their students that the students themselves did not mention. However, it may be worth noting that teachers also noticed some educational benefits, strengthening the case for CL. These included benefits in terms of improved communication skills and team-working abilities. The major differences reveal areas for caution that educational planners could prepare to deal with in advance. This includes the issue of distraction in some classes that compromises the quality of CL, which is also important to ensure attention.

In comparing TCL and CSCL, the key findings highlighted in section 7.11.6.3 generally favour CSCL except for where technical challenges were faced because these do not apply in the case of TCL. As expected, CSCL excels in delivering audio-visual resources, searching quickly, sharing ideas in online forums, and saving time. In addition, the observations showed differences in terms of attention. It appeared that CSCL could also motivate and engage students more than TCL, which makes them less inclined to be distracted and focus more on class. The very nature of CSCL also allows for learning remotely and asynchronously. This gives it a significant edge in terms of flexibility because the learners do not need to be in the same place or collaborate live at the same time.

Furthermore, the discussion on CL practices in Saudi Arabia is significant given that traditional non-CL learning practices, in contrast with CL, retain a stronghold in the Saudi education system. This is understandable due to the cultural characteristics identified in section 2.2, such as high collectivism and power distance, and the tendency to avoid uncertainty or conflict. The introduction of CSCL challenges all of these, and, at the same time, helps to overcome the requirement of gender segregation, which otherwise limits cross-gender interaction.

Collectivism is challenged because CL grants some autonomy to students to take more control over their learning outside the traditional teacher-centred paradigm. However, by students working together collaboratively, it can be said that CL practices also promote collectivism. This kind of collectivism reduces the power distance when compared to the relative status of traditional teachers as central figures. It is more in line with student-centred learning arrangements.

CL practices can contribute immensely to the Saudi education system by allowing students of both genders to work together through interaction using computers safely. These widened social opportunities are discussed in section 8.4.5. These are essentially opportunities for exchange, but they also offer other benefits, such as encouraging all students to participate, building a spirit of cooperation, and developing team-working skills. Power distance is discussed further under implications for teachers in section 9.7.2.

## **9.6 Limitations of the Study**

The present study was limited to collecting data from male students and their teachers in the preparatory year of a selected HE institution in Saudi Arabia: Hail University. It was also limited to those classes in which CL is practised, as otherwise it would not have provided useful data. Furthermore, the findings were limited by what was obtained through the three methods of observations, focus group sessions, and individual interviews. Consequently, generalising the results

is impossible due to the small sample that this study relied on for data collection and analysis. Simply put, the study is not fully representative of all Saudi teachers' and students' experiences, but it does provide indicative data and trends.

Furthermore, time constraints prohibited this study from producing enriched data because the data were collected during the five months from June to October 2019. Another related time constraint is that this study's writing phase started before the pandemic. During the Covid-19 pandemic, digital technology and social media platform use played an important role in educational systems, as CSCL was often adopted to facilitate the remote education that replaced F2F classes. As such, results could have been significantly different if data collection had been done during the pandemic.

Finally, the lack of previous research studies on the Saudi context did not provide the theoretical foundations for the research questions this study was investigating and curtailed an in-depth data analysis. Nevertheless, this study took an important opportunity to identify literature gaps and present the need for further development in the study area.

Finally, the results of this study would have been more rewarding if the questions and answers had been in English. Unfortunately, many meanings have been lost in translation because expressing a concept in Arabic is very different from describing it in English. In this regard, Nes et al. (2010) explained that "as translation is also an interpretive act, meaning may get lost in the translation process". Nonetheless, the researcher aimed at potentially decreasing the loss of meaning and enhancing the validity of cross-English qualitative research. For instance, for rich descriptions, the researcher used quotations from the participants for their contribution to trustworthiness in qualitative research. Furthermore, special attention was given when metaphors were translated, either in the quotations or in the findings. Where necessary, the researcher sought the support of a professional translator.

## **9.7 Implications and Recommendations**

This section now goes on to consider the wider implications of this study's findings for students, teachers, HE institutions, and policymakers in SA before offering recommendations and avenues for further research.

### **9.7.1 Implications for Saudi students**

Compared to teachers, the impression in this study was that students were more receptive to CL, particularly CSCL. This was apparent, for example, in comments such as CL being considered as

“better” than “old learning” and “very effective”, and recognising it as convenient, “easy and flexible”, and enabling students to think “and to understand faster” (see section 7.3). The implication is that students are already inclined to adopt CL, so not many of them are likely to need motivation and encouragement in this regard.

However, the key contributions highlighted in the synthesised discussion showed several points worth noting in respect of students. For example, it was pointed out that CL makes students more attentive in class, broadens their horizons, helps them gain new perspectives and generate ideas, and facilitates remembering things and learning together. These potential benefits suggest that CL can be exploited to realise them, especially in cases where it is known that these aspects are deficient in certain students.

### **9.7.2 Implications for teachers in Saudi Arabia**

Based on their past experience, one participant described CSCL as “a paradigm shift”, which indicated that CSCL is a greatly different approach to teaching and learning than the participants are normally used to. However, traditional non-CL methods of education still have a stronghold in the Saudi education system, in which, unlike the case in CL, the power distance is high (see section 2.2). This would suggest it is likely to be a challenge to make teachers and students in Saudi Arabia accept and adopt CL practices, although there was no sign of this at the selected institution. Rather, many teachers are receptive to adopting CL practices, especially the younger ones, as well as the students. This confirmed Alammar’s (2017) finding that Saudi students have become more open-minded towards using CL over the years. Therefore, relevant training is required for teachers to enhance their skills in terms of technology and provide them with workshops to raise their awareness of how CSCL is now an important way of teaching and learning.

Nonetheless, if Saudi culture accommodates this modern form of learning, some adaptations may be necessary (as discussed in section 8.5.3). For instance, it may be required for teachers to be prepared to guide their students adequately before a CL session, more than they might expect in countries where students are more accustomed to CL or self-learning generally. Furthermore, it was noted in Dr A2’s class that the teacher was instrumental in engaging and motivating his students. As well as the distraction-free environment, this may have helped keep students attentive. Furthermore, the teacher ensured openness for his students to express their ideas. Therefore, teachers should prioritise student motivation and encourage the free expression of their ideas. The open expression could be particularly beneficial for shy students, as shown in this present study (see 7.11.2).

Power distance has been shown in this study to be perhaps the most important cultural characteristic that has implications for teachers. As highlighted in section 7.11.3, teachers feel this weakening of the power distance between them and their students under CL arrangements. They believe in the need to retain control, for lecturers to intervene, and the right to give students a briefing before they begin and to modify the information they obtain at the end. In other words, it can be said that teachers prefer a controlled CL implementation. Students can benefit from the briefing, as some prefer this kind of guidance, but this is a high power distance CL arrangement. In the case that both teachers and students are comfortable with this form of CL, it can be considered as more suitable for the Saudi context compared to the CL arrangement practised in Western education systems. Therefore, teachers' mentality is hindering an effective CL application because believing in a power distance does not enhance the skills of Saudi students. Instead, it widens that gap between the teaching and learning parts of the process. It cannot be in line with modern life. This is especially so since the start of the pandemic, when the power distance disappeared as learning became more online and conducted through different tools. Thus, teachers' interference decreased.

### **9.7.3 Implications for Saudi universities and national policymakers**

The evidence from this study may have important implications for educational policymakers. Firstly, the observation that Dr A2's class was exemplary in creating an "excellent" supportive environment, largely due to the teacher's preparedness, could be seen as a model for implementing CL successfully. Universities and other policymakers can look at such examples to devise supportive policies and guide teachers in implementing CL. Given that a distraction-free classroom environment was an important factor in this success, universities should ensure this type of setting. Problems such as unsupportive desks and loud air conditioners also hinder effective CL application. Therefore, a suitable environment for practising CL must be helpful. Therefore, replacing unsupportive desks and noisy air conditioners necessitates an effective strategy from the policymakers.

For dealing with the concealed use of mobile phones during class time, keeping students motivated and engaged is a good strategy to stop them using their phones. The study also indicated the need for more of the resources necessary for CL to take place (see 8.5.1). A lack of resources should concern institutions and public education bodies because CSCL would not be possible at all, or else it would be deficient without them.

### **9.7.4 Recommendations for supporting CSCL**

This present study has some recommendations suitable for enhancing the application of CSCL in Saudi universities. For example, the need for institutional support was highlighted in section 8.5.2. It

confirmed a similar finding in Asiri et al. (2012) and Alhomod and Shafi (2013) for the same Saudi HE context. These two previous studies were conducted a decade ago, so the finding that institutional support may still be inadequate should be a cause for concern and attention. Institutional approval is especially needed for improving resources and making curricular and learning materials more supportive of CL. Institutions should support teachers by providing sufficient training and arranging workshops and counselling. Institutions could also identify examples of good practice within their departments and use them as exemplars for other faculty members.

Considering that both teachers and students expressed a preference for what may be described as high power distance CL, whereby students are given information and guidance instead of being left to collaborate without these, this form of CL is advised for the Saudi context. Particular contexts or situations in which CL, especially CSCL, is worth implementing would, for example, be where students need to be provided with more opportunities to learn from their fellow students, where many shy or low-confidence students are present in a class, and where cross-gender interaction would be productive. Other beneficial situations are developing team-working skills and building a spirit of cooperation among students. The “*broadening of horizons*” as an impact of applying CL is a finding which indicates another potential context if the need is felt for students to achieve this.

### **9.7.5 Recommendations for further research**

As pointed out in section 8.5.3, the data in the present study and the literature reviewed conflict internally on what constitutes the ideal group in terms of students’ abilities. More research is advised on the ideal group type for supporting CL. The discussion on maintaining a power distance in section 7.11.3 suggests that more research should be conducted to see which form of CL would suit Saudi culture or have better prospects in the kingdom. It might also be the case that cooperative learning, which is similar to CL, and more teacher control is retained (see section 3.4) and would be preferred to CL, especially by the teachers given the desire they expressed for more control over their students’ learning. This was described as CL based on maintaining a high power distance where teachers brief and guide their students.

### **9.8 Personal Reflections**

Developing a research problem is usually a challenging personal process. However, it is manageable and doable as it clarifies over time. Therefore, investigating CL among students and their teachers in Saudi Arabia has equipped me with the necessary research skills to complete this study. Being at this stage now, viewing my experiences since the start of my PhD trajectory, I see them as opportunities for learning. There were moments where I made mistakes and reached a closed path with my thesis,

but the help of my supervisors was always a relief that enlightened that path to revisit my thinking and reorganise my ideas. Data collection was a challenging phase. The Saudi context lacks significant studies on this topic as the kingdom is just starting to modify its **educational systems to include CL and adopt the use of the digital technologies that can facilitate CSCL**. Saudi HE is racing to change and develop educational strategies that do not keep pace with the modern period. This lack of sources helped develop my research methods to look for data in different ways and filter these data to be compatible with my thesis.

Nevertheless, my chosen methodology had both disadvantages and advantages. The former has to do with the time it took me to learn about the topic, gain access to comprehensive existing studies, conduct the interviews and focus group observations, and collect information. In addition, cost was an issue in order to access some data online. The latter deals with the opportunities the methodology yielded to delve into the understandings of teachers and students with regard to the implementation of CL, which is, in my own words, a learning strategy that affords students enormous opportunities and advantages not available through traditional learning processes prevailing in HE. Therefore, this thesis has enlightened me on the importance of CL, which needs more effort to be disseminated in HE in Saudi Arabia.

In the end, CL in Saudi Arabia is still in the first phase and needs governmental and institutional efforts to advance it effectively to produce significant learning and teaching outcomes. Therefore, the effectiveness of collaborative teaching and learning approaches in increasing students' satisfaction in learning outcomes, experiences, and achievements will always be curtailed if no new methods or initiatives are adopted to replace the non-CL traditional learning and teaching processes.

## REFERENCES

- Abercrombie, M. L. J. (1974). *Aims and techniques of group teaching*. London: Society for Research into Higher Education.
- Adelman, C., Jenkins D. & Kemmis, S. (1980). Rethinking case study: notes from the second Cambridge conference. In Simons, H. (ed) *Towards a Science of the Singular: Essays about case study in educational research and evaluation*. Norwich, UK: Centre for Applied Research in Education, University of East Anglia, 45–61.
- Akyol, Z. & Garrison, D. R. (2011) Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology*, 42(2), 233–250.
- Al Asraj, A., Freeman, M. & Chandler, P. A. (2011) Considering cognitive load theory within e-learning environments. *PACIS 2011 Proceedings*, 14. Brisbane, 7-11 July 2011.
- Al Shlowiy, A. (2021) Tracking Saudi EFL students' reflections of online learning during coronavirus: Different rounds. *Frontiers in Education*, 6, article 770786. doi: <https://doi.org/10.3389/educ.2021.770786>.
- Al-Asmari, A. M. & Rabb Khan, M. S. (2014) E-learning in Saudi Arabia: Past, present and future. *Near and Middle Eastern Journal of Research in Education*, 2014(1). doi: <https://doi.org/10.5339/nmejre.2014.2>
- Al-Azawei, A., Parslow, P. & Lundqvist, K. (2016) Barriers and opportunities of e-learning implementation in Iraq: A case of public universities. *International Review of Research in Open and Distributed Learning*, 17(5), 126–146.
- Al-Harbi, K. A. S. (2011) E-Learning in the Saudi tertiary education: Potential and challenges. *Applied Computing and Informatics*, 9(1), 31–46.
- Al-Harbi, M. A. A. (2019) *The challenges and the possibilities to the use of technology in the teaching and learning of English language as a case study*. PhD thesis. University of Lincoln.
- Al-Homod, S. & Shafi, M. M. (2013) Success factors of e-learning projects: A technical perspective. *The Turkish Online Journal of Educational Technology*, 12(2), 247–253.
- Al-Ismaiel, O. A. (2013) *Collaborative blended learning with higher education students in an Arabic context*. PhD thesis. University of Wollongong.
- Al-Jarf, R. (2013). The use of computer-supported collaborative learning in EFL writing classrooms in Saudi Arabia. *International Journal of Emerging Technologies in Learning*, 8(1), 26-31.
- Al-Khalifa, H. S. (2010) E-Learning and ICT integration in colleges and universities in Saudi Arabia. *eLearn*, 2010(3). Available online: <http://elearnmag.acm.org/archive.cfm?aid=1735849> [Accessed 12/09/2017].
- Al-Kinani, M. (2013) Saudi education catching up with the world's best. *Arab News*, 4 November [Online]. Available at: <http://www.arabnews.com/news/472241> [Accessed 17/07/2017].
- Al-Seghayer, K. (2014) The four most common constraints affecting English language teaching in Saudi Arabia. *International Journal of English Linguistics*, 4(5), 17–26.
- Al-Wahaibi, K., Al-Wabil, A., Alshawi, A. & Alshankity, Z. (2008) Barriers to Internet adoption among faculty in Saudi Arabian universities. *Proceedings of World Conference on Educational*

*Multimedia, Hypermedia, and Telecommunications*. Vienna, 30 June 2008. Chesapeake, VA: AACE, 24–33.

- Al-Zahrani, A., & Salama, A. (2013). The effectiveness of computer-supported collaborative learning in developing EFL learners' writing skills. *International Journal of Emerging Technologies in Learning*, 8(4), 4-10.
- Al-Qahtani, A. A. & Higgins, S. E. (2013) Effects of traditional, blended and elearning on students' achievement in higher education. *Journal of Computer Assisted Learning*, 29(3), 220–234.
- Alahdal, A. & Al-Ahdal, A. A. M. H. (2019) Effectiveness of collaborative learning as a strategy in the teaching of EFL. *Opción: Revista de Ciencias Humanas y Sociales*, 35(Special issue 20), 1026–1043.
- Alammar, M. (2017) The role of collaborative vs. individual writing in improving essay writing: A case study on Saudi learners. *International Journal of Arts & Sciences*, 10(2), 653–668.
- Alanazy, S. (2011) *Saudi students' attitudes, beliefs, and preferences toward coeducational online cooperative learning*. PhD thesis. Wayne State University.
- Alasmari, I. (2014) *Improving teaching and learning in higher education through the use of e-learning: Mixed methods research in one of the southern universities in Saudi Arabia*. PhD thesis. University of Southampton.
- Alblehai, F. (2011) A course constructing model for Saudi e-Learning environments. *European Journal of Scientific Research*, 59(1), 63–67.
- Albugami, S. & Ahmed, V. (2016) Effects of culture and religion on the use of ICT in the Saudi education system. *Paper presented at the IRES 13th International Conference on E-Education, E-Business, E-Management and E-Learning (IC4E)*. Istanbul, 23 January 2016.
- AlDahdouh A., Osorio, A. & Caires, S. (2017) Understanding knowledge network, learning and connectivism. *International Journal of Instructional Technology and Distance Learning*, 12(10), 3–21.
- Alfonseca, E., Carro, R. M., Martín, E., Ortigosa, A. & Paredes, P. (2006) The impact of learning styles on student grouping for collaborative learning: A case study. *User Modeling and User-Adapted Interaction*, 16, 377–401.
- Algami, F. & Male, T. (2014) Leadership in Saudi Arabian public schools: Time for devolution? *International Studies in Educational Administration*, 42(3), 19–33.
- Alghamdi, A., Karpinski, A. C., Lepp, A. & Barkley, J. (2020) Online and face-to-face classroom multitasking and academic performance: Moderated mediation with self-efficacy for self-regulated learning and gender. *Computers in Human Behavior*, 102, 214–222.
- Alghamdi, O. M. (2018) *Saudi college students' attitudes towards online collaborative learning*. PhD thesis. University of Kansas.
- Alghamdi, S. R. (2016) Use and attitude towards learning management systems in Saudi Arabian universities. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(9), 2309–2330.
- Alhamood, W. (2020) Traditional teaching methods in the Hail region of Saudi Arabia. *Encyclopaedia of the Kingdom of Saudi Arabia*. Available online: <https://ksaency.com/article/> [Accessed 10/05/2022].
- Alharbi, A. H., & Al-Mekhlafi, G. A. (2019). Collaborative learning in higher education in Saudi Arabia: Culture as a background factor. *Journal of Educational and Social Research*, 9(1), 115-124.

- Alharbi, F., & Smith, M. (2015). Saudi Arabian context: A review of CSCL systems. *Journal of Educational Technology Development and Exchange*, 8(1), 1-14.
- Alhogail, A. A. & Mirza, A. A. (2011) Implementing a virtual learning environment (VLE) in a higher education institution: A change management approach. *Journal of Theoretical and Applied Information Technology*, 31(1), 42–52.
- Ali, S. H., Sait, S. M. & Al-Tawil, K. M. (2012) Perceptions about e-Learning in Saudi Arabia. *ICASE World Conference on Science and Technology Education*, 393–399.
- Aljaber, A. (2018) E-learning policy in Saudi Arabia: Challenges and successes. *Research in Comparative and International Education*, 13(1), 176–194.
- Alkhalaf, S., Nguyen, A. & Drew, S. (2010) Assessing eLearning systems in the Kingdom of Saudi Arabia's higher education sector: An exploratory analysis. *2010 International Conference on Intelligent Network and Computing (ICINC 2010)*. Kuala Lumpur, Malaysia, 26-28 November 2010, 284–287.
- Alkhalaf, S., Nguyen, J., Nguyen, A. & Drew, S. (2013) Online learner satisfaction and collaborative learning: Evidence from Saudi Arabia. *International Journal of Information and Communication Technology*, 9(2), 66–78.
- Alkhannani, B. M. (2021) The effectiveness of collaborative teaching and learning and engaging students as partners on English language teaching in Saudi Arabia. *Theory & Practice in Language Studies*, 11(10), 1288–1294.
- Allmnakrah, A., & Evers, C. (2020) The need for a fundamental shift in the Saudi education system: Implementing the Saudi Arabian economic vision 2030. *Research in Education*, 106(1), 22–40. <https://doi.org/10.1177/0034523719851534>
- Almajed, A. A. R. (2015) *Collaborative learning: Students' perceptions and experiences*. PhD thesis. The University of Adelaide
- Almankory, A. (2013) *Adoption of online learning in Saudi Arabia: A case study of MKCL's ERA*. Master's thesis. University of Nottingham.
- Almullah, M. (2016) An investigation of Saudi teachers' perceptions towards training in cooperative learning. *International Journal of Social Sciences*, 2(1), 715–737.
- Almutairi, S., Heller, M. & Yen, D (2020) Reclaiming the heterogeneity of the Arab states. *Cross-Cultural Strategic Management*.
- Alnesyan, A. (2012) *Teaching and learning thinking skills in the Kingdom of Saudi Arabia: Case studies from seven primary schools*. PhD thesis. University of Exeter.
- Alqarni, A. A. (2015) Educational technology in Saudi Arabia: A historical overview. *International Journal of Education, Learning and Development*, 3(8), 62–69.
- Alqasham, F. H. & Al-Ahdal, A. A. M. H. (2022) Effectiveness of mind-mapping as a digital brainstorming technique in enhancing attitudes of Saudi EFL learners to writing skills. *Journal of Language and Linguistic Studies*, 18(Special Issue 1), 379–394.
- Alqurashi, E. (2017). Exploring the challenges of implementing computer-supported collaborative learning in Saudi Arabian higher education. *Journal of Educational Technology Development and Exchange*, 10(1), 1-12.
- Alqurashi, F. (2009) *E-Learning in EFL: Problems and solutions*. Makkah: Umm Al-Qura University.

- Alsaeed, H. R. M. (2014) *An investigation into cultural and demographic factors relating to leadership in vocational education and training institutions in Saudi Arabia*. PhD thesis. University of Hull.
- Alshahrani, K. & Al-Shehri, S. (2012) Conceptions and responses to e-learning: The case of EFL teachers and students in a Saudi Arabian university. *Monash University Linguistics Papers*, 8(1), 21–31.
- Alshammari, S H., Ali, M. B. & Rosli, M. S. (2016) The influences of technical support, self-efficacy and instructional design on the usage and acceptance of LMS: A comprehensive review. *The Turkish Online Journal of Educational Technology*, 15(2), 116–125.
- Alsmadi, M. K., Al-Marashdeh, I., Alzaqebah, M., Jaradat, G., Alghamdi, F. A., Mohammad, R. M. A., Alshabanah, M., Alrajhi, D., Alkhaldi, H., Aldhafferi, N., Alqahtani, A., Badawi, U. A. & Tayfour, M. (2021) Digitalization of learning in Saudi Arabia during the COVID-19 outbreak: A survey. *Informatics in Medicine Unlocked*, 25, article 100632. doi: <https://doi.org/10.1016/j.imu.2021.100632>.
- Alzamil, Z. A. (2006) Students' perception towards the E-Learning at the GOTEVOT and the Arab Open University in Riyadh. *Journal of King Saud University: Educational Sciences and Islamic Studies*, 18(2), 655–698.
- Ansari, J. A. N. & Khan, N. A. (2020) Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environments*, 7(9). doi: <https://doi.org/10.1186/s40561-020-00118-7>.
- Appavoo, P., Sukon, K., Gokhool, A. & Gooria, V. (2019) Why does collaborative learning not always work even when the appropriate tools are available? *Turkish Online Journal of Distance Education*, 20(4), 11–30.
- Armstrong, M. C. (2011) *Perceptions on collaborative learning: A case study of female community college instructors*. PhD thesis. University of South Florida.
- Asino, T. I. & Pulay, A (2019) Student perceptions on the role of the classroom environment on computer supported collaborative learning. *TechTrends*, 63(2), 179–187.
- Asiri, M. J., Mahmud, R., Bakar, K. A. & Ayub, A. F. M. (2012b) Role of attitude in utilization of Jusun LMS in Saudi Arabian universities. *Procedia – Social and Behavioral Sciences*, 64 (IETC 2012 special edition), 525–534.
- Askool, S. (2011) Scientific study: Traditional educational institutions in Saudi Arabia do not count successful students, unified trade. *Copts United*, 24 July [Online]. Available at: <https://www.copts-united.com/article.php?A=40444&I=874> [Accessed 10/05/2021].
- Aslan, A. (2021) The evaluation of collaborative synchronous learning environment within the framework of interaction and community of inquiry: An experimental study. *Journal of Pedagogical Research*, 5(2), 72–87. doi: <http://dx.doi.org/10.33902/JPR.2021269326>.
- Atay, D. & Karacan, C. G. (2021) Broadening horizons through 21st century-oriented language education. In Gökmen, D. U., Ercan, A. & Silahtaroglu, I. R. (eds) *English language teaching in the 21st century: Changing identities, agencies, and mindsets*. Istanbul: Marmara University Press, 8–22.
- Augar, N., Raitman, R. & Zhou, W. (2012) Teaching and learning online with wikis. *Proceedings of the 21<sup>st</sup> ASCILITE Conference*. Perth, Australia, 5-8 December 2004, 95–104.
- Balasubramanian, A. (2020) *Pedagogy for online teaching*. doi: <https://doi.org/10.13140/RG.2.2.32852.63368>.

- Beaudoin, M. F. (2003) Learning or Lurking? Tracking the 'Invisible' Online Student. Available on: <http://www.c3l.uni-oldenburg.de/cde/found/fall03/Mod1Readings/Beaudoin.pdf> [Accessed 21/01/2023]
- Behnagh, R. F. & Yasrebi, S. (2020) An examination of constructivist educational technologies: Key affordances and conditions. *British Journal of Educational Technology*, 51(6), 1907–1919.
- Bekhet, A. K. & Zauszniewski, J. A. (2012) Methodological triangulation: An approach to understanding data. *Nurse Researcher*, 20(2), 40–43.
- Benson, P. (2010) Teacher education and teacher autonomy: Creating spaces for experimentation in secondary school English language teaching. *Language Teaching Research*, 14(3), 259–275.
- Bhagat, K. K., Wu, L. Y. & Chang, C. Y. (2019) The impact of personality on students' perceptions towards online learning. *Australasian Journal of Educational Technology*, 35(4), 98–108.
- Bhat, S., Bhat, S., Raju, R., D'Souza, R. & Binu K. G. (2020) Collaborative learning for outcome-based engineering education: A lean thinking approach. *Procedia Computer Science*, 172, 927–936.
- Biasutti, M. (2017) A comparative analysis of forums and wikis as tools for online collaborative learning. *Computers & Education*, 111, 158–171.
- Borge, M. & Mercier, E. (2019) Towards a micro-ecological approach to CSCL. *International Journal of Computer-Supported Collaborative Learning*, 14(2), 219–235.
- Boud, D., Cohen, R. & Sampson, J. (2002) *Peer learning in higher education: Learning from and with each other*. London: Kogan.
- Bourke, B. (2014) Positionality: Reflecting on the research process. *The Qualitative Report*, 19(33). doi: 10.46743/2160-3715/2014.1026.
- Bouroumi, A. & Fajr, R. (2014) Collaborative and cooperative e-learning in higher education in Morocco: A case study. *International Journal of Emerging Technologies in Learning*, 9(1), 66–72.
- Bousbahi, F. & Alrazgan, M. S. (2015) Investigating IT faculty resistance to learning management system adoption using latest variables in an Acceptance Technology Model. *The Scientific World Journal*, 2015, article 375651. doi: <https://doi.org/10.1155/2015/375651>.
- Bredl, K. & Bosche, W. (2013) *Serious games and virtual worlds in education, professional development, and healthcare*. Hershey, PA: Idea Group Inc.
- Brennan, M. (2020) *The use of asynchronous discussion to support collaborative learning in an online programme*. PhD thesis. University of Hertfordshire.
- Brindley, J., Blaschke, L. M. & Walti, C. (2009) Creating effective collaborative learning groups in an online environment. *The International Review of Research in Open and Distance Learning*, 10(3). doi: <https://doi.org/10.19173/irrodl.v10i3.675>.
- Bruffee, K. A. (1992) Collaborative learning and the conversation of mankind. In Goodsell, A. S. (ed) *Collaborative learning: A sourcebook for higher education*. Washington, DC: National Center on Postsecondary Teaching, Learning and Assessment, 30–45.
- Bryant, A. & Charmaz, K. (2010) *The SAGE handbook of grounded theory*. London: Sage.
- Bryman, A. (2012) *Social research methods*, 4<sup>th</sup> edition. Oxford, UK: Oxford University Press.
- Bryman, A. & Bell, E. (2007) *Business Research Methods*. Oxford: Oxford University Press.
- Buck, G. H. (1989) M. E. LaZerte: Pioneer educational innovator. *Alberta Journal of Educational Research*, 35(2), 112–122.

- Burke, A. (2011) Group work: How to use groups effectively. *The Journal of Effective Teaching*, 11(2), 87–95.
- Caballe, S., Daradoumis, T., Xhafa, F. & Juan, A. (2011) Providing effective feedback, monitoring and evaluation to on-line collaborative learning discussions. *Computers in Human Behavior*, 27, 1372–1381.
- Cacciamani, S., Cesareni, D., Martini, F., Ferrini, T. & Fujita, N. (2012) Influence of participation, facilitator style, and metacognitive reflection on knowledge building in online university courses. *Computers & Education*, 58(3), 874–884.
- Capdeferro, N. & Romero, M. (2012) Are online learners frustrated with collaborative learning experiences. *The International Review of Research in Open and Distributed Learning*, 13(2), 26–44.
- Carvalho, A., Areal, N. & Silva, J. (2011) Students' perceptions of blackboard and moodle in a Portuguese university. *British Journal of Educational Technology*, 42(5), 824–841.
- Casey, D. & Murphy, K. (2009) Issues in using methodological triangulation in research. *Nurse Researcher*, 16(4), 40–55.
- Cashion, J. & Palmieri, P. (2002) The secret is the teacher: The learner's view of online learning. *National Centre for Vocational Education Research (NCVER)*. Available online: <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/the-secret-is-the-teacher-the-learners-view-of-online-learning> [Accessed 02/02/2017].
- Casserley, F. (2016) *It is not the tool, but pedagogy that matters: Investigation of ICT use in further education*. Raleigh, NC: Lulu.
- Catalano, C. (2018) The development of personal skills by collaborative learning activities. *Educattia* 21, 2018(16), 86–91. doi: 10.24193/ed21.2018.16.10.
- Chakraborty, P., Mittal, P., Gupta, M. S., Yadav, S. & Arora, A. (2020) Opinion of students on online education during the Covid-19 pandemic. *Human Behavior and Emerging Technologies*, 3, 357–365. doi: <https://doi.org/10.1002/hbe2.240>.
- Chandler, P. & Sweller, J. (1992) The spilt-attention effect as a factor in the design of instruction. *British Journal of Educational Psychology*, 62, 233–246.
- Chang, H. & Windeatt, S. (2016) Developing collaborative learning practices in an online language course. *Computer Assisted Language Learning*, 29(8), 1271–1286.
- Charmaz, K. (2006) *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis*. Thousand Oaks: Sage.
- Chen, J., Wang, M., Kirschner, P. A. & Tsai, C-C. (2018) The role of collaboration, computer use, learning environments, and supporting strategies in CSCL: A meta-analysis. *Review of Educational Research*, 88(6), 799–843.
- Chen, Y-H., Jang, S-J. & Chen, P-J. (2015) Using wikis and collaborative learning for science teachers' professional development. *Journal of Computer Assisted Learning*, 31, 330–344.
- Chen, Y. (2021) Cross-Cultural differences in collaborative learning and relevant factors. *Advances in Social Science, Education. & Human Research*, 594.
- Cheng, F-F., Wu, C-S. & Su, P-C. (2021) The impact of collaborative learning and personality on satisfaction in innovative teaching context. *Frontiers in Psychology*, 12. doi: <https://doi.org/10.3389/fpsyg.2021.713497>.
- Chiong, R. & Jovanovic, J. (2012) Collaborative learning in online study groups: An evolutionary game theory perspective. *Journal of Information Technology Education*, 11, 81–101.

- Chioran, A. (2022) Why is collaborative learning important? *Nuiteq*. Available online: <https://www.nuiteq.com/company/blog/why-is-collaborative-learning-important> [Accessed 10/05/2022].
- Cho, M. H. & Cho, Y. (2014) Instructor scaffolding for interaction and students' academic engagement in online learning: Mediating role of perceived online class goal structures. *The Internet and Higher Education*, 21, 25–30.
- Cho, Y-H. & Lim, K. Y. T. (2017) Effectiveness of collaborative learning with 3D virtual worlds. *British Journal of Educational Technology*, 48(1), 202–211.
- Christopher, D. A. (2003) Interactive large lecture classes and the dynamics of teacher/student interaction. *Journal of Instruction Delivery Systems*, 17(1), 13–18.
- CIRT. (n.d.) Benefits and limitations of experimental research. *Center for Innovation in Research and Teaching*. Available online: [https://cirt.gcu.edu/research/developmentresources/research\\_ready/experimental/benefits\\_limits](https://cirt.gcu.edu/research/developmentresources/research_ready/experimental/benefits_limits) [Accessed 09/06/2018].
- Clarà, M. & Barberà, E. (2013) Learning online: Massive Open Online Courses (MOOCs), connectivism, and cultural psychology. *Distance Education*, 34(1), 129–136.
- Clark, R. C., Nguyen, F. & Sweller, J. (2006) *Efficiency in learning: Evidence-based guidelines to manage cognitive load*. San Francisco, CA: Pfeiffer.
- Cobb, P. & Bauersfeld, H. (2012) *The emergence of mathematical meaning: Interaction in classroom cultures*. New York, NY: Routledge.
- Cohen, L., Manion, L. & Morrison, K. (2018) *Research methods in education*, 8<sup>th</sup> edition. New York, NY: Routledge.
- Colbran, S. & Al-Ghreif, N. (2013) The role of information technology in supporting quality teaching and learning. In Smith, L. & Abouammoh, A. (eds) *Higher education in Saudi Arabia: Achievements, challenges and opportunities*. Dordrecht, Netherlands: Springer, 73–82.
- Collins, A. (2016) A brief history of mass collaboration: How innovations over time have enabled people to work together more effectively. In Cress, U., Moskaliuk, J. & Jeong, H. (eds) *Mass collaboration and education*. Cham, Switzerland: Springer, 31–42.
- Collis, J. & Hussey, R. (2014) *Business research*, 4th ed. Basingstoke: Palgrave Macmillan.
- Colton, D. & Covert, R. W. (2007) *Designing and constructing instruments for social research and evaluation*. Hoboken, NJ: John Wiley & Sons.
- Cowan, J. & Astall, C. (2010) Exploring collaborative learning: Experiences of a web 2.0 tool within a pre-service teacher education environment. *Computers in New Zealand Schools: Learning, Teaching, Technology*, 22(3), 1–22. Available online: <https://www.otago.ac.nz/cdelt/cinzs/otago064505.html> [Accessed 12/05/2022].
- Crawford, R. (2013) *The ICT teacher's handbook: Teaching, learning and managing ICT in the secondary school*. London: Routledge.
- Creswell, J. W. (2012) *Research design: Qualitative, quantitative, and mixed methods approaches*, 4<sup>th</sup> edition. Thousand Oaks, CA: Sage.
- Creswell, J. W. (2014) *Research design: Qualitative, quantitative, and mixed methods approaches*, 4<sup>th</sup> edition. Thousand Oaks, CA: Sage.
- Creswell, J. W. & Creswell, J. D. (2018) *Research design: Qualitative, quantitative, and mixed methods approaches*, 5<sup>th</sup> edition Thousand Oaks, CA: Sage.

- Creswell, J. W. & Plano Clark, V. L. (2007) *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
- CSCL. (2022) *CSCL Classroom*. Available online: <http://www.csc.villanova.edu/~beck/csc8570/csl/csl.html> [Accessed 10/05/2022].
- Cullen, R., Kullman, J. & Wild, C. (2013) Online collaborative learning on an ESL teacher education programme. *ELT Journal*, 67(4), 425–434.
- Cunningham, J. M. (2015) Mechanizing people and pedagogy: Establishing social presence in the online classroom. *Journal of Asynchronous Learning Network*, 19(3). doi: <http://dx.doi.org/10.24059/olj.v19i3.476>.
- Cypress, B. (2017) Rigor or reliability and validity in qualitative research:
- Daly, M. (2003) *Methodology*, in Miller, R.L. & Brewer, J.D. (eds) *The A–Z of Social Research*. London: Sage.
- Damon, W. & Phelps, E. (1989) Critical distinctions among three approaches to peer education. *International Journal of Educational Research*, 13(1), 9–19.
- Davies, J. & Graff, M. (2005) Performance in e-learning: Online participation and student grades. *British Journal of Educational Technology*, 36(4), 657–663.
- Davis, F. D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–339.
- Davis, F. D. & Warshaw, P. R. (1992) Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22(14), 1111–1132.
- De Faria, E. S. J., Adan-Coello, J. M. & Yamanaka, K. (2006) Forming groups for collaborative learning in introductory computer programming courses based on students' programming styles: An empirical study. In *Proceedings of the IEEE 36<sup>th</sup> Annual Frontiers in Education Conference*. San Diego, CA, 27-31 October 2006. New York, NY: IEEE, 6–11.
- De Jong, T. (2010) Cognitive load theory, educational research, and instructional design: some food for thought. *Instructional Science*, 38, 105–134. doi: <https://doi.org/10.1007/s11251-009-9110-0>.
- De Nooijer, J., Schneider, F. & Verstegen, D. M. L. (2021) Optimizing collaborative learning in online courses. *The Clinical Teacher's Toolbox*, 18, 19–23. doi: <https://doi.org/10.1111/tct.13243>.
- Den Exter, K., Rowe, S., Boyd, W. & Lloyd, D. (2012) Using Web 2.0 technologies for collaborative learning in distance education – case studies from an Australian university. *Future Internet*, 4(1), 216–237.
- Denzin, N. K. (1978). *The Research Act: A theoretical introduction to sociological methods*. McGraw-Hill.
- Deresky, H. (2002) *Global management: Strategic and interpersonal*. Upper Saddle River, NJ: Prentice Hall.
- Deters, F., Cuthrell, K. & Stapleton, J. (2010) Why wikis? Student perceptions of using wikis in online coursework. *Journal of Online Learning and Teaching*, 6(1), 122–134.
- Dias, S. B., Diniz, J. A. & Hadjileontiadis, L. J. (2014) *Towards an intelligent learning management system under blended learning: Trends, profiles and modelling perspectives*. Cham, Switzerland: Springer Science & Business Media.
- Dignath, C. & Büttner, G. (2018) Teachers' direct and indirect promotion of self-regulated learning in primary and secondary school mathematics classes—insights from video-based classroom observations and teacher interviews. *Metacognition and Learning*, 13(2), 127–157.

- Dillenbourg, P. (1999) What do you mean by “collaborative learning”? In Dillenbourg, P. (ed) *Collaborative-learning: Cognitive and Computational Approaches*. Bingley, UK: Emerald, 1–19.
- Dillenbourg, P. (1999). Collaborative learning: Cognitive and computational approaches. *Advances in learning and instruction series*. Elsevier.
- Dillenbourg, P., Baker, M., Blaye, A. & O'Malley, C. (1996) The evolution of research on collaborative learning. In Reimann, P. & Spada, H. (eds) *Learning in humans and machines: Towards an interdisciplinary learning science*. Oxford, UK: Elsevier, 189–211.
- Dillenbourg, P., Jarvela, S. & Fischer, F. (2009) The evolution of research on computer-supported collaborative learning. In Balacheff, N., Ludvigsen, S., Jong, T., Lazonder, A. & Barnes, S. (eds) *Technology-enhanced learning*. Amsterdam: Springer, 3–19.
- Dörnyei, Z. (2007) *Research methods in applied linguistics*. Oxford: Oxford University Press.
- Downes S. (2020) Recent work in connectivism. *European Journal of Open, Distance and E learning*, 22(2), 113–132.
- Drew, C. J., Hardman, M. L. & Hosp, J. L. (2008) *Designing and conducting research in education*. Los Angeles, CA: Sage.
- Driscoll, M. (2002) Blended learning: Let’s get beyond the hype. *IBM Global Services*. Available online: [http://www-07.ibm.com/services/pdf/blended\\_learning.pdf](http://www-07.ibm.com/services/pdf/blended_learning.pdf) [Accessed 24/02/2017].
- Duiker, W. J. & Spielvogel, J. J. (2007) *World History*. Belmont, CA, Thomson/Wadsworth.
- Dziuban, C., Graham, C. R., Moskal, P. D., Norberg, A. & Sicilia, N. (2018) Blended learning: The new normal and emerging technologies. *International Journal of Education Technology in Higher Education*, 15, article 3. doi: <https://doi.org/10.1186/s41239-017-0087-5>.
- Easterby-Smith, M., Thorpe, R. & Jackson, P. R. (2008) *Management Research: An Introduction, 3rd edition*. London: Sage Publications.
- Echeverría, L., Benitez, A., Buendia, S., Cobos, R. & Morales, M. (2016) Using a learning analytics manager for monitoring of the collaborative learning activities and students' motivation into the Moodle system. *Proceedings of the 2016 IEEE 11th Colombian Computing Conference (CCC)*. Popayan, Colombia, 27-30 September 2016.
- Educational Technology Publications. (1966) *Educational technology*, vol. 16. Englewood Cliffs, NJ: Educational Technology Publications.
- Eisenhart, M., & Howe, K. (1992) Validity in educational research. In LeCompte, M., Millroy, W. & Preissle, J. (eds) *The handbook of qualitative research in education*. San Diego, CA: Academic Press, 642–680.
- Etherington, C. (2017) How PLATO changed the world... in 1960. *ELearning Inside*. Available online: <https://news.elearninginside.com/how-plato-changed-the-world-in-1960/> [Accessed 30/04/2021].
- European Education Policy Network. (2022) *Collaborative learning and collaborative school leadership in the digital age*. Available online: [https://educationpolicynetwork.eu/wp-content/uploads/2021/03/Deliverable\\_2\\_2\\_Collaborative\\_learning\\_final-for-publication.pdf](https://educationpolicynetwork.eu/wp-content/uploads/2021/03/Deliverable_2_2_Collaborative_learning_final-for-publication.pdf) [Accessed 10/05/2022].
- Evors, P. A. (2020) *Inside collaborative communities: Teachers’ perceptions of the collaborative process*. PhD thesis. University of North Florida.
- Fatimah, S., Rajiani, I. & Abbas, E. W. (2020) Cultural and individual characteristics in adopting computer-supported collaborative learning during covid-19 outbreak: Willingness or obligatory to accept technology? *Management Science Letters*, 11(2), 373–378.

- Fields, D. A., Kafai, Y. B. & Giang, M. T. (2016) Coding by choice: A transitional analysis of social participation patterns and programming contributions in the online Scratch community. In Cress, U., Moskaliuk, J. & Jeong, H. (eds) *Mass collaboration and education*. Cham, Switzerland: Springer, 209–240.
- Fini, A. (2005) *Enhanced forum features for CSCL*. Available online: <https://moodle.org/mod/forum/discuss.php?d=26081> [Accessed 10/05/2022].
- Fisher, C. (2010) *Researching and writing a dissertation: An essential guide for business students*. Harlow, UK: Pearson Education.
- Fomsi, E. F. & Njoku, C. (2011) Undergraduate students' readiness for the use of online chat for collaborative learning. *TechnoLearn: An International Journal of Educational Technology*, 1(1), 1–11.
- Forment, M. A., De Pedro, X., Casañ, M. J., Piguillem, J. & Galanis, N. (2010) Requirements for successful Wikis in collaborative educational scenarios. *International Journal of Knowledge Society Research*, 1(3), 44–58.
- Forment, M. A., De Pedro, X., Casañ, M. J., Piguillem, J. & Galanis, N. (2012) Wikis in collaborative educational scenarios: Integrated in LMS or standalone wikis? *International Journal of Distance Education Technologies*, 10(4), 72–81.
- Fox-Jensen, E. (2021). Course Module creation based on Gilly Salmon's Five Stage Model. 10.13140/RG.2.2.22361.80482.
- Fransen, J., Kirschner, P. A. & Erkens, G. (2011) Mediating team effectiveness in the context of collaborative learning: The importance of team and task awareness. *Computers in Human Behavior*, 27(3), 1103–1113.
- Fullan, M. (2007) *The New Meaning of Educational Change*, 4th ed., London, Teachers College Press.
- Garbin, M. C., Garcia, M. F., do Amaral, S. F., da Silva, D. & de Abreu, R. R. (2015) Teacher's perception on collaborative learning processes: Experiencing continuing teacher education in Brazil. *Procedia - Social and Behavioral Sciences*, 191, 2231–2235. doi: <https://doi.org/10.1016/j.sbspro.2015.04.431>.
- García-Valcárcel, A., Basilotta Gómez-Pablos, V. & López García, C. (2014). ICT in Collaborative Learning in the Classrooms of Primary and Secondary Education. *Comunicar*. 21. 65-74. 10.3916/C42-2014-06.
- Garrison, D. R., Anderson, T. & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, 15(1), 7-23.
- Garrison, J., Neubert, S. & Reich, K. (2012) *John Dewey's philosophy of education: An introduction and recontextualization for our times*. New York, NY: Palgrave Macmillan.
- Gebre, E. (2012) *Students' engagement in technology rich classrooms and its relationship to professors' conceptions of effective teaching*. PhD thesis. McGill University, Montreal.
- Gebre, E., Saroyan, A. & Bracewell, R. (2014) Students' engagement in technology rich classrooms and its relationship to professors' conceptions of effective teaching. *British Journal of Educational Technology*, 45(1), 83–96.
- Geiss, T. & Roman, G. (2013) Building communities of practice through collaborative learning at NATO school. *E-Learning & Software for Education*, 2, 307–311.

- Ghavifekr, S. (2020) Collaborative learning: A key to enhance students' social interaction skills. *Malaysian Online Journal of Educational Sciences*, 8(4), 9–21.
- Gilles, R. M., Ashman, A. F. & Terwel, J. (2008) *The teacher's role in implementing co-operative learning in the classroom*. New York, NY: Springer.
- Godat, M. (2012) *Collaborative learning and critical thinking in technology-enhanced environments: An instructional design framework*. PhD thesis. Queensland University of Technology.
- Goldman-Segall, R. & Maxwell, J. (2002) Computers, the Internet, and new media for learning. In Reynolds, W. M. & Miller, G. E. (eds) *Handbook of psychology: Educational psychology*, vol. 7. New York, NY: Wiley & Sons, 393–427.
- Gouzouasis, P. (2012) *Pedagogy in a new tonality*. Rotterdam, Netherlands: SensePublishers.
- Greenhow, C. & Robelia, B. (2009) Informal learning and identity formation in online social networks. *Learning Media and Technology*, 34(2), 119–140.
- Gross, D. M. & Kemmann, A. (2005) *Heidegger and rhetoric*. Albany, NY: State University of New York Press.
- Gu, X., Wang, H. & Mason, J. (2017) Are they thinking differently: A cross-cultural study on the relationship of thinking styles and emerging roles in computer-supported collaborative learning. *Educational Technology & Society*, 20(1), 13–24.
- Guasch, T., Espasa, A., Alvarez, I. M. & Kirschner, P. A. (2013) Effects of feedback on collaborative writing in an online learning environment. *Distance Education*, 34(3), 324–338. doi: 10.1080/01587919.2013.835772.
- Haataja, E., Malmberg, J. & Jarvela, S. (2018) Monitoring in collaborative learning: Co-occurrence of observed behavior and physiological synchrony explored. *Computers in Human Behavior*, 87, 337–347.
- Habibi, N. (2015) Is Saudi Arabia training too many graduates? *University World News* [Online]. Available at: [www.universityworldnews.com/article.php?story=20150714013422488](http://www.universityworldnews.com/article.php?story=20150714013422488) [Accessed 23/08/2018].
- Hakkinen, P. (2002) History and development of collaborative learning and e-learning in Europe: Lessons learned. *Keynote address at the Asia-Europe Classroom, 2nd International Teachers' Conference*. Tampere, Finland, 11-14 September 2002.
- Hall, E. & Hall, M. (1990) *Understanding cultural differences: Germans, French and Americans*. Boston, MA: Intercultural Press.
- Harasim, L. (2012) *Learning theory and online technologies*. New York, NY: Routledge.
- Heaton-Shrestha, C., Gipps, C., Edirisingha, P. & Linsey, T. (2007) Learning and e-learning in HE: The relationship between student learning style and VLE use. *Research Papers in Education*, 22(4), 443–464.
- Hegarty, M., Kriz, S. & Cate, C. (2003) The roles of mental animations and external animations in understanding mechanical systems. *Cognition and Instruction*, 21(4), 209–249.
- Helyer, R. (2015) Learning through reflection: The critical role of reflection in work-based learning (WBL). *Journal of Work-Applied Management*, 7(1), 15–27. doi: <https://doi.org/10.1108/JWAM-10-2015-003>.
- Hernández-Sellés, N., Muñoz-Carril, P. C. & González-Sanmamed, M. (2019) Computer-supported collaborative learning: An analysis of the relationship between interaction, emotional support and online collaborative tools. *Computers & Education*, 138, 1–12.

- Hernández-Sellés, N., Muñoz-Carril, P. C. & González-Sanmamed, M. (2020) Interaction in computer supported collaborative learning: An analysis of the implementation phase. *International Journal of Educational Technology in Higher Education*, 17, article 3. doi: <https://doi.org/10.1186/s41239-020-00202-5>.
- Herrmann, Z. (2022) Roles that encourage equitable collaborative learning. *Edutopia* [online]. Available at: <https://www.edutopia.org/article/roles-encourage-equitable-collaborative-learning> [Accessed 10/05/2022].
- Hewage, C. R. & Perera, L. C. R. (2013) Pedagogical significance of wikis: Towards gaining effective learning outcomes. *Journal of International Education in Business*, 6(1), 51–70.
- Hmelo-Silver, C. E., Chinn, C. A., Chan, C. & O'Donnell, A. M. (2013) *The international handbook of collaborative learning*. New York, NY: Routledge.
- Hofstede, G. (1984) *Culture's consequences: International differences in work-related values*. Newbury Park, CA: Sage.
- Hofstede, G. & Hofstede, G. J. (2005) *Cultures and organizations: Software of the mind*. New York, NY: McGraw-Hill.
- Holmes, A. G. D. (2020) Researcher positionality - A consideration of its influence and place in qualitative research - A new researcher guide. *Shanlax International Journal of Education*, 8(4), 1–10. doi: <https://doi.org/10.34293/education.v8i4.3232>.
- Horton, W. (2011) *E-Learning by design*, 2<sup>nd</sup> edition. San Francisco, CA: John Wiley & Sons.
- Hwang, W-Y., Wang, C-Y. & Sharples, M. (2007) A study of multimedia annotation of web-based materials. *Computers & Education*, 48(4), 680–699.
- Impagliazzo, J. (2008) *History of computing and education 3 (HCE3)*. IFIP 20th World Computer Congress, Proceedings of the Third IFIP Conference on the History of Computing and Education WG 9.7/TC9, History of Computing. Milan, 7-10 September 2008.
- IRMA. (2010) *Web-based education: Concepts, methodologies, tools and applications*. Hershey, PA: Idea Group Inc.
- Janssen, J. & Kirschner, P. A. (2020) Applying collaborative cognitive load theory to computer-supported collaborative learning: Towards a research agenda. *Educational Technology Research & Development*, 68(2), 783–805.
- Janssen, J., Erkens, G. & Kanselaar, G. (2007) Visualization of agreement and discussion processes during computer-supported collaborative learning. *Computers in Human Behavior*, 23(3), 1105–1125.
- Jarvela, S. & Hadwin, A. F. (2013) New frontiers: Regulating learning in CSCL. *Educational Psychologist*, 48(1), 25–39.
- Jarvela, S., Kirschner, P. A., Panadero, E., Malmberg, J., S., Phielix, C., Jaspers, J., Koivuniemi, M. & Järvenoja, H. (2015) Enhancing socially shared regulation in collaborative learning groups: Designing for CSCL regulation tools. *Educational Technology Research and Development*, 63(1), 125–142.
- Järvenoja H., Malmberg, J., Törmänen, T., Mänty, K., Haataja, E., Ahola, S. & Järvelä, S. (2020) A collaborative learning design for promoting and analyzing adaptive motivation and emotion regulation in the science classroom. *Frontiers in Education*, 5. doi: <https://doi.org/10.3389/educ.2020.00111>.
- Jeong, H. (2013) Development of group understanding via the construction of physical and technological artifacts. In Suthers, D. D., Lund, K., Rose, C., Teplovs, C. & Law, N. (eds)

*Productive multivocality in the analysis of group interactions*. Cambridge, MA: MIT Press, 331–351.

- Jeong, H. & Hmelo-Silver, C. E. (2016) Seven affordances of computer-supported collaborative learning: How to support collaborative learning? How can technologies help? *Educational Psychologist*, 51(2), 247–265.
- Johnson, D. & Johnson, R. (2003) Student motivation in cooperative groups: Social interdependence theory. In Gilles, R. & Ashman, A. (eds) *Cooperative Learning: The social and intellectual outcomes of learning in groups*. London: Routledge.
- Johnson, R. B., Onwuegbuzie, A. J. & Turner, L. A. (2007) Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112–133.
- Judd, T., Kennedy, G. & Cropper, S. (2010) Using wikis for collaborative learning: Assessing collaboration through contribution. *Australasian Journal of Educational Technology*, 26(3), 341–354.
- Jung, I., Kudo, M. & Choi, S-K. (2012) Stress in Japanese learners engaged in online collaborative learning in English. *British Journal of Educational Technology*, 43(6), 1016–1029. doi: 10.1111/j.1467-8535.2011.01271. x.
- Kalyuga, S. (2008) Relative effectiveness of animated and static diagrams: An effect of learner prior knowledge. *Computers in Human Behavior*, 24(3), 852–861.
- Keengwe, J. (2015) *Handbook of research on educational technology integration and active learning*. Hershey, PA: IGI Global.
- Kerimbayev, N., Kultan, J., Abdykarimova, S. & Akramova, A. (2017) LMS Moodle: Distance international education in cooperation of higher education institutions of different countries. *Educational Information Technology*, 22, 2125–2139.
- Kerr, S. (2016) Saudi Arabia, cutting its budget, turns to private schools. *The Financial Times* [Online], 22 November. Available at: <https://www.ft.com/content/ab450160-9c1f-11e6-8324-be63473ce146>.
- Kessen, W. (1983) *History, theory and methods, vol. 1 of Mussen, P. (ed) Handbook of child psychology*, 4th edition. Hoboken, NJ: Wiley.
- Kessler, G. & Bikowski, D. (2010) Developing collaborative autonomous learning abilities in computer mediated language learning: Attention to meaning among students in wiki space. *Computer Assisted Language Learning*, 23(1), 41–58.
- Khalil, R., Mansour, A. E., Fadda, W. A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., Alkhalifah, A. & Al-Wutayd, O. (2020) The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students' perspectives. *BMC Medical Education*, 285(2020). doi: <https://doi.org/10.1186/s12909-020-02208-z>.
- Khan, A. B. & Mansoor, H. S. (2020) Integrated collaborative learning approach (ICLA): Conceptual framework of pedagogical approach for the integration of language skills. *Competitive Social Sciences Research Journal*, 1(1), 14–28.
- Khogali, S. E., Davies, D. A., Donnan, P. T., Gray, A., Harden, R. M., McDonald, J., Pippard, M. J., Pringle, S. D. & Yu, N. (2011) Integration of e-learning resources into a medical school curriculum. *Medical Teaching*, 33(4), 311–318.
- Khosrow-Pour, M. (2020) *Handbook of research on modern educational technologies, applications, and management*. Hershey, PA: IGI Global.

- Kim, K. J., Liu, S. & Bonk, C. J. (2005) Online MBA students' perceptions of online learning: Benefits, challenges, and suggestions. *The Internet and Higher Education*, 8(4), 335–344.
- Kirschner, P. A. (2002) Cognitive load theory: Implications of cognitive load theory on the design of learning. *Learning and Instruction*, 12(1), 1–10.
- Kirschner, P. A., & Erkens, G. (2013). Toward a framework for CSCL research. *Educational psychologist*, 48(1), 1-8.
- Kirschner, P. A., Sweller, J., Kirschner, F. & Zambrano, R. (2018) From cognitive load theory to collaborative cognitive load theory. *International Journal of Computer-Supported Collaborative Learning*, 13(2), 213–233. doi: <https://doi.org/10.1007/s11412-018-9277-y>.
- Kleynhans, C. & Roberson, J. (2018) Students' experience of collaborative learning methods employed in hospitality financial management. *Paper presented at the 35<sup>th</sup> International Academic Conference*. Barcelona, 15 May 2018.
- Knutas, A., Ikonen, J. & Porras, J. (2019) Computer-supported collaborative learning in software engineering education: A systematic mapping study. *International Journal on Information Technologies & Security*, 7(4). doi: <https://doi.org/10.48550/arXiv.1906.10710>.
- Kock, N. (2009) *E-collaboration: Concepts, methodologies, tools, and applications*. Hershey, PA: IGI Global.
- Korkmaz, Ö. (2013) CEIT teacher candidates' attitude toward online collaborative learning and their opinions. *Ilkogretim Online*, 12(1), 283–294.
- Krishnaswamy, K. N., Sivakumar, A. I. & Mathirajan, M. (2006) *Management research methodology: Integration of principles, methods and techniques*. New Delhi, India: Dorling Kindersley.
- Ku, H-Y., Tseng, H. W. & Akarasriworn, C. (2013) Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. *Computers in Human Behavior*, 29(3), 922–929.
- Kumar, R. (2017) *The effect of collaborative learning on enhancing student achievement: A meta-analysis*. PhD thesis. Concordia University.
- Kumar, V. & Sharma, D. (2016) Creating collaborative and convenient learning environment using cloud-based Moodle LMS: An instructor and administrator perspective. *International Journal of Web-Based Learning and Teaching Technologies*, 11(1), 35–50.
- Kurata, S., Fujiki, T. & Murota, M. (2019) Development and verification of a system to support cooperative learning based on peer review by visual video annotation on portable mobile device. *Japan Journal of Educational Technology*, 43(1), 31–41.
- Kuren, E. & Cellatoglu, A. (2008) E-education over homogenous network. In Iskander, M. (ed) *Innovative techniques in instruction technology, e-learning, e-assessment and education*. Dordrecht, Netherlands: Springer, 129–134.
- Laal, M. & Ghodsi, S. (2012) Benefits of collaborative learning. *Procedia - Social and Behavioral Sciences*, 31(2012), 486–490. doi: <https://doi.org/10.1016/j.sbspro.2011.12.091>.
- Lajoie, S. & Lu, J. (2012) Supporting collaboration with technology: Does shared cognition lead to co-regulation in medicine? *Metacognition Learning*, 7, 45–62.
- Lambert, J., Kalyuga, S. & Capan, L. A. (2009) Student perceptions and cognitive load: What can they tell us about e-learning Web 2.0 course design? *E-Learning*, 6(2), 150–163.
- Laughton, P. (2011) The use of wikis as alternatives to learning content management systems. *The Electronic Library*, 29(2), 225–235.

- Law, N., Yuen, J., Wing, O. W. & Leng, J. (2011) Understanding learners' knowledge building trajectory through visualizations of multiple automated analyses. In Puntambekar, S., Erkens, G. & Hmelo-Silver, C. E. (eds) *Analyzing interactions in CSCL: Methods, approaches and issues*. New York, NY: Springer, 47–82.
- Lawrence, B. & Lentle-Keenan, S. (2013) Teaching beliefs and practice, institutional context, and the uptake of web-based technology. *Distance Education*, 34(1), 4–20.
- Le, H., Janssen, J. & Wubbels, T. (2018) Collaborative learning practices: Teacher and student perceived obstacles to effective student collaboration. *Cambridge Journal of Education*, 48(1), 103–122.
- Lee, J. & Osman, G. (2021) Students' experiences and perceptions of online collaborative learning in higher education of Korea and the UAE. *Turkish Online Journal of Distance Education*, 22(1). Available at: <https://dergipark.org.tr/en/download/article-file/1477128> [Accessed 03/05/2022].
- Lee, J. E. (2019) *Examining the effects of discussion strategies and learner interactions on performance in online introductory mathematics courses: An application of learning analytics*. PhD thesis. Utah State University.
- Lee, T-C. (2007) *Using web-based CALL to improve English language mastery at the Republic of China Air Force Academy*. PhD thesis. Nova Southeastern University.
- Leijen, Ä., Pedaste, M. & Lepp, L. (2019) Teacher agency following the ecological model: How it is achieved and how it could be strengthened by different types of reflection. *British Journal of Educational Studies*, 1(16), 295–310.
- LeTS. (2018) Observations. *Learning and Teaching Services*. Available at: <https://www.sheffield.ac.uk/lets/strategy/resources/evaluate/general/methods-collection/observation> [Accessed 15/06/2018].
- Liao, H. & Liu, S. (2012) A comparison analysis on the intention to continued use of a lifelong learning website. *International Journal of Electronic Business Management*, 10(3), 213–223.
- Lin, L. (2017) Cultural flows and pedagogical dilemmas: Teaching with collaborative learning in the Chinese HE EFL context. *Chinese Journal of Applied Linguistics*, 40(1), 21–41.
- Lin, Y-T., Wu, C. C. & Chiu, C. F. (2018) The use of wiki in teaching programming: Effects upon achievement, attitudes, and collaborative programming behaviours. *International Journal of Distance Education Technologies*, 16(3), 18–45.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.
- Linnenbrink-Garcia, L., Tyson, D. F. & Patall, E. A. (2008) When are achievement goal orientations beneficial for academic achievement? A closer look at moderating factors. *International Review of Social Psychology*, 21(1), 19–70.
- Linnenbrink, E. A. & Pintrich, P. R. (2000) Multiple pathways to learning and achievement: The role of goal orientation in fostering adaptive motivation, affect, and cognition. In Sansone, C. & Harackiewicz, J. M. (eds) *Intrinsic and extrinsic motivation: The search for optimal motivation and performance*. San Diego, CA: Academic Press, 195–227.
- Liu, S., Joy, M. & Griffiths, N. (2009) iGLS: Intelligent grouping for online collaborative learning. In *Proceedings of the 9th IEEE International Conference on Advanced Learning Technologies*. Riga, Latvia, 15-17 July 2009. New York, NY: IEEE Computer Society, 364–368.
- Liu, S., Joy, M. & Griffiths, N. (2010) Students' perceptions of the factors leading to unsuccessful group collaboration. *2010 IEEE 10th International Conference on Advanced Learning Technologies (ICALT)*. Sousse, Tunisia, 5-7 July 2010, 565–569.

- Luger, E. (2009) *Hofstede's cultural dimensions*. Norderstedt, Germany: GRIN Verlag.
- Mahawan, K. & Langprayoon, P. (2020) The effect of blended learning with collaborative learning upon English communication skills of English teaching program students. *Paper presented at the 5th International STEM Education Conference (iSTEM-Ed)*. Hua Hin, Thailand, 4-6 November 2020, 55–58.
- Maltby, A. & Mackie, S. (2009) Virtual learning environments – help or hindrance for the 'disengaged' student? *Research in Learning Technology*, 17(1), 49–62.
- Management Help. (2018) General guidelines for conducting research interviews. *Management Help* [Online]. Available at: <https://managementhelp.org/businessresearch/interviews.htm> [Accessed 07/01/2018].
- Marcotte, Kayla & Gruppen, Larry. (2022) Competency-Based Education as Curriculum and Assessment for Integrative Learning. *Education Sciences*, 12, 267. 10.3390/educsci12040267.
- Martens, R., Bastiaens, T. & Kirschner, P. A. (2007) New learning design in distance education: The impact on student perception and motivation. *Distance Education*, 28(1), 81–93.
- Masmali, A. (2016). Investigating the use of computer-supported collaborative learning (CSCL) in the Saudi Arabian higher education context. *International Journal of Emerging Technologies in Learning*, 11(2), 53-57.
- Mason, E. (1972) *Collaborative learning*. London: Ward Look Educational.
- Masrom, M. & Hussein, R. (2008) *User acceptance of information technology: Understanding theories and model*. Selangor, Malaysia: Venton.
- Mayer, R. & Moreno, R. (2002) Aids to computer-based multimedia learning. *Learning and Instruction*, 12, 107–119.
- Medeiros, F., Gomes, A. S., Amorim, R. & Medeiros, G. (2013) Architecture for social interactions monitoring in collaborative learning environments as a support for the teacher's awareness. *IEEE 13<sup>th</sup> International Conference on Advanced Learning Technologies*. Beijing, China, 15-18 July 2013.
- Mesh, L. J. (2010) Collaborative language learning for professional adults. *Electronic Journal of E-Learning*, 8(2), 161–172.
- Messeguer, R., Medina, E., Royo, D., Navarro, L. & Juarez, J. P. (2010) Group prediction in collaborative learning. *Proceedings of the 6<sup>th</sup> International Conference on Intelligent Environments*. Kuala Lumpur, Malaysia, 19-21 July 2010, 350–355.
- Miles, M. B. & Huberman, A. M. (1994) *Qualitative data analysis: A sourcebook of new methods*. Thousand Oaks, CA: Sage.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.
- Miller, L. D., Eck, A., Soh, L-K. & Jiang, H. (2007) Statistics and analysis tools for a computer-supported collaborative learning system. *37<sup>th</sup> Annual Frontiers in Education Conference*. Milwaukee, WI, 10-13 October 2007.
- MOE. (2015) LMS platforms in Saudi universities. *Ministry of Higher Education, Kingdom of Saudi Arabia* [Online]. Available at: <http://www.moe.gov.sa/ar/Pages/default.aspx> [Accessed 23/12/2016].
- Mohamed, A., Abuzaid, R. & Benladen, R. (2008) Opportunities and challenges of the knowledge management approach to e-learning: A case study in Al-Bayan Girls' School, Kingdom of Saudi Arabia. *The Electronic Journal of Information Systems in Developing Countries*, 35. Available online: <https://onlinelibrary.wiley.com/toc/16814835/2008/35/1>.

- Montellanos-Solís, A. R., García-Riveros, J. M., Fuertes-Meza, L. C., Vergaray, J. M. & Flores, E. (2021) Collaborative learning an active methodology in long distance education. *Natural Volatiles & Essential Oils*, 8(4), 2443–2457.
- Mooij, M. (2009) *Cross-cultural communication in a globalised world*. Available online: <http://www.fco.gov.uk/en/about-the-fco/publications/publications/pd-publication/cross-cultural> [Accessed 17/08/2017].
- Morrison, K. R. B. (1993) *Planning and accomplishing school-centred evaluation*. Dereham, UK: Peter Francis.
- Mutdriyanti, A. (2016) *The effectiveness of collaborative learning method for teaching writing to tenth grade students of SMA Muhammadiyah Surakarta in 2015/2016 academic year*. BA dissertation. University of Surakarta.
- Muuro, M. E., Oboko, R. & Wagacha, W. P. (2016) Evaluation of intelligent grouping based on learners' collaboration competence level in online collaborative learning environment. *International Review of Research in Open and Distributed Learning*, 17(2). doi: <https://doi.org/10.19173/irrodl.v17i2.2066>.
- Muuro, M. E., Wagacha, W. P., Kihoro, J. & Oboko, R. (2014) Students' perceived challenges in an online collaborative learning environment: A case of higher learning institutions in Nairobi, Kenya. *The International Review of Research in Open and Distributed Learning*, 15(6), 132–161.
- Namdar, B. & Shen, J. (2018) Knowledge organization through multiple representations in a computer-supported collaborative learning environment. *Interactive Learning Environments*, 26(5), 638–653.
- Naykki, P., Jarvela, S., Kirschner, P. A. & Jarvenoja, H. (2014) Socio-emotional conflict in collaborative learning—A process-oriented case study in a higher education context. *International Journal of Educational Research*, 68, 1–14.
- Naz, F. & Murad, H. (2017) Innovative teaching has a positive impact on the performance of diverse students. *SAGE Open*, October 2017. doi: [10.1177/2158244017734022](https://doi.org/10.1177/2158244017734022).
- Nicolson, M. & Uematsu, K. (2013) Collaborative learning, face-to-face or virtual: the advantages of a blended learning approach in an intercultural research group. *International Journal of Research and Method in Education*, 36(3), 268–278.
- Nishimura, S., Nevgi, A. & Tella, S. (2008) Communication style and cultural features in high/low context communication cultures: A case study of Finland, Japan and India. In Kallioniemi, A. (ed) *Uudistuva ja kehittyvä ainedidaktiikka: Ainedidaktinen symposiumi* (conference proceedings). Helsinki, Finland, 8 February 2008. Helsinki: Helsingin yliopisto, 783–796.
- NMC. (2017) *NMC horizon report: 2017*, higher education edition. Austin, TX: New Media Consortium.
- Nokes-Malach, T. J., Richey, J. E. & Gadgil, S. (2015) When is it better to learn together? Insights from research on collaborative learning. *Educational Psychology Review*, 27, 645–656.
- Nooijer, J., Schneider, F. & Verstegen, D. (2021) Optimizing collaborative learning in online courses. *Clinical Teacher*, 18(1), 19–23.
- Noroozi, O., Weinberger, A., Biemans, H. J. A., Mulder, M. & Chizari, M. (2013) Facilitating argumentative knowledge construction through a transactive discussion script in CSCL. *Computers and Education*, 61, 59–76.
- NU. (2017) Flexible and distributed learning policy. *Newcastle University* [Online]. Available at [www.ncl.ac.uk/ltts/assets/documents/qsh-flexdistbtdlearning-pol.pdf](http://www.ncl.ac.uk/ltts/assets/documents/qsh-flexdistbtdlearning-pol.pdf) [Accessed 02/07/2017].

- O'Malley, C. (1995) Designing computer support for collaborative learning. In O'Malley, C. (ed) *Computer supported collaborative learning*. Berlin: Springer, 283–298.
- O'Malley, C. (2012) *Computer supported collaborative learning*. Berlin: Springer.
- Oncu, S. & Cakir, H. (2011) Research in online learning environments: Priorities and methodologies. *Computers & Education*, 57(1), 1098–1108.
- Orehovacki, T., Bubas, G. & Konecki, M. (2009) Web 2.0 in education and potential factors of Web 2.0 use by students of information systems. *Proceedings of the ITI 31st International Conference on Information Technology Interfaces*. Cavtat, Croatia, 22-25 June 2009. New York, NY: IEEE, 443–448.
- Orlando Jr, M. J. (2016) *Understanding teachers' perception of collaborative professional development in private secondary faith-based schools: An interpretative phenomenological analysis*. PhD thesis. Northeastern University.
- Overdijk, M. & van Diggelen, W. (2008) Appropriation of a shared workspace: Organizing principles and their application. *International Journal of Computer-Supported Collaborative Learning*, 3(2), 165–192.
- Pando, V. F. (2018) Teaching trends in virtual education: An interpretative approach. *Propósitos y Representaciones*, 6(1), 463–505.
- Patalong, F. (2016) Vision 2030 and the transformation of education in Saudi Arabia. *Al Tamimi & Co.* [Online]. Available at: <http://www.tamimi.com/en/magazine/law-update/section-14/august-2/vision-2030-and-the-transformation-of-education-in-saudi-arabia.html> [Accessed 12/07/2017].
- Persico, D., Pozzi, F. & Sarti, L. (2010) Monitoring collaborative activities in computer supported collaborative learning. *Distance Education*, 31(1), 5–22.
- perspectives, strategies, reconceptualization, and recommendations. *Dimensions of Critical Care Nursing*, 36 / No. 4.
- Peterson, A. T. & Roseth, C. J. (2016) Effects of four CSCL strategies for enhancing online discussion forums: Social interdependence, summarizing, scripts, and synchronicity. *International Journal of Educational Research*, 76, 147–161. doi: <https://doi.org/10.1016/j.ijer.2015.04.009>.
- Phillips, D. C. (1995) The good, the bad, and the ugly: The many faces of constructivism. *Educational Researcher*, 24(7), 5–12.
- Picciano A. G. (2017) Theories and frameworks for online education: Seeking an integrated model. *Online Learning*, 21(3), 166–190.
- PIE Blog. (2022) The online learning can enable educators to reach an almost limitless audience. Available online: <https://blog.thepienews.com/2022/02/online-learning-can-enable-educators-to-reach-an-almost-limitless-audience/> [Accessed 11/05/2022].
- Pintrich, P. R. (2000) Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92, 544–555.
- Pishva, D., Nishantha, G. & Dang, H. (2010) A survey on how Blackboard is assisting educational institutions around the world and the future trends. *Paper presented at the the 12<sup>th</sup> International Conference on Advanced Communication Technology (ICACT)*. Gangwon, South Korea, 7-10 February 2010. New York, NY: IEEE, 1539–1543.
- Pitler, H., Hubbell, E. R. & Kuhn, M. (2012) *Using technology with classroom instruction that works*, 2<sup>nd</sup> edition. Alexandria, VA: ASCD.
- Plass, J. L., Moreno, R. & Brunken, R. (2010) *Cognitive load theory*. Cambridge, UK: Cambridge University Press.

- Pollard, A., Anderson, J., Maddock, M., Swaffield, S., Warin, J. & Warwick, P. (2008) *Reflective teaching*, 3<sup>rd</sup> edition. London: Continuum.
- Pollock, E., Chandler, P. & Sweller, J. (2002) Assimilating complex information. *Learning and Instruction*, 12(1), 61–86.
- Posey, L. & Lyons, L. (2011) The instructional design of online collaborative learning. *Journal of Education Research*, 5(3/4), 361–380.
- Poudel, A. P. (2020) Computer supported collaborative learning for developing higher order thinking skill in ELT. *International Journal of Multidisciplinary Perspectives in Higher Education*, 5(1), 34–51.
- Qiu, M., Hewitt, J. & Brett, C. (2012) Online class size, note reading, note writing and collaborative discourse. *International Journal of Computer-Supported Collaborative Learning*, 7(3), 423–442.
- Quackenbush, M. (2020) *The effects of self-regulated learning training on teachers' self-regulated learning, self-efficacy for teaching, and perceived instructional effectiveness in computer-supported collaborative learning environments*. PhD thesis. Old Dominion University.
- Quamar, M. M. (2021) *Education system in Saudi Arabia: Of change and reforms*. Singapore: Palgrave Macmillan.
- Radkowsch, A., Vogel, F. & Fischer, F. (2020) Good for learning, bad for motivation? A meta-analysis on the effects of computer-supported collaboration scripts. *International Journal of Computer-Supported Collaborative Learning*, 15(1), 5–47.
- Rahmawati (2016) *The effectiveness of collaborative learning in teaching speaking at the tenth grade of Madrasah Aliyah Negeri Purworejo in the academic year 2015/2016*. S1 thesis. Muhammadiyah University.
- Ramos, J., Cattaneo, A., de Jonk, F. & Espadeiro, R. G. (2021) Pedagogical models for the facilitation of teacher professional development via video-supported collaborative learning: A review of the state of the art. *Journal of Research on Technology in Education*. doi: <https://doi.org/10.1080/15391523.2021.1911720>.
- Ramsden, P. (2003) *Learning to teach in higher education*, 2<sup>nd</sup> edition. London: Routledge.
- Razek, N. & Coyner, S. C. (2013) Cultural impacts on Saudi students at a Mid-western American university. *Counselor Education and Human Services Faculty Publications*, 4. Available online: [https://ecommons.udayton.edu/edc\\_fac\\_pub/4](https://ecommons.udayton.edu/edc_fac_pub/4).
- Rehman, A. A. & Alharthi, K. (2016) An introduction to research paradigms. *International Journal of Educational Investigations*, 3(8), 51–59.
- Retnowati, E., Ayres, P. & Sweller, J. (2018) Collaborative learning effects when students have completed or incomplete knowledge. *Applied Cognitive Psychology*, 32(6), 681–692.
- Rienties, B., Tempelaar, D., den Bossche, P., Gijssels, W. & Segers, M. (2009) The role of academic motivation in computer-supported collaborative learning. *Computers in Human Behavior*, 25(6), 1195–1206.
- Rimor, R., Rosen, Y. & Naser, K. (2010) Complexity of social interactions in collaborative learning: The case of online database environment. *Interdisciplinary Journal of E-Learning & Learning Objects*, 6, 355–365.
- Roberts, T. S. (2004) *Computer-supported collaborative learning in higher education*. Hershey, PA: Idea Group Inc.
- Robson, S. (2006) *Developing thinking and understanding in young children*. London: Routledge.

- Rodriguez, C., Hudson, R. & Niblock, C. (2018) Collaborative learning in architectural education: Benefits of combining conventional studio, virtual design studio and live projects. *British Journal of Educational Technology*, 49(3), 337–353.
- Rogers, E. M. (1995) *Diffusion of innovations*, 4<sup>th</sup> edition. New York, NY: Free Press.
- Rogoff, B. (1994) Developing understanding of the idea of communities of learners. *Mind, Culture and Activity*, 1(4), 209–229.
- Rotgers, A., Fuhrer, A., Flum, L., Jaranowski, P. & Wearner, R. (2012) Trends in learning management systems: How collaborative tools and learning analytics are changing our ideas about what an LMS should be. *Trends Paper*.
- Rubin, A. & Babbie, E. R. (2005) *Research Methods for Social Work*, 5<sup>th</sup> edition. California: Thomson Learning.
- Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data*, 3rd edition. Thousand Oaks, CA: Sage.
- Sadeghi, H. & Kardan, A. A. (2016) Toward effective group formation in computer-supported collaborative learning. *Interactive Learning Environments*, 24(3), 382–395.
- Sahab, S. (2005) Starting e-learning program at King Abdul-Aziz University in Saudi Arabia. *World Conference on Educational Multimedia, Hypermedia and Telecommunications*. Montreal, Canada, 27 June – 2 July 2005.
- Saldana, Johnny. (2013). *The coding manual for qualitative researchers*. Sage Publications.
- Salmon, G. (2000) The Five-Stage Model of Online Learning. Retrieved online at <https://itlc.science.ku.dk/english/papers/model/> (Accessed on May 15, 2021).
- Santos, D., Torres Junior, J. & de Lacerda, C. (2019) Broadening horizons through distance learning: New challenges for education in Brazil and some other geographical areas. *Creative Education*, 10(1), 156–162. doi: <https://10.4236/ce.2019.101012>.
- Sarmiento, J. W. & Stahl, G. (2008) Group creativity in interaction: Collaborative referencing, remembering, and bridging. *International Journal of Human-Computer Interaction*, 24(5), 492–504.
- Saunders, M. N. K., Lewis, P. & Thornhill, A. (2009) *Research methods for business students*, 5<sup>th</sup> edition. Harlow, UK: Prentice Hall.
- Saunders, M. N. K., Lewis, P. & Thornhill, A. (2012) *Research methods for business students*, 6<sup>th</sup> edition. Harlow, UK: Pearson.
- Sbaraini, A., Carter, S., Evans, W. & Blinkhorn, A. (2011) How to do a grounded theory study: a worked example of a study of dental practices Alexandra. *BMC Medical Research Methodology*. Available online: <file://adir.hull.ac.uk/home/479/479167/Desktop/1471-2288-11-128.pdf> [Accessed on 14/03/2020].
- Scager, K., Boonstra, J., Peeters, T., Vulperhorst, J. & Wiegant, F. (2016) Collaborative learning in higher education: Evoking positive interdependence. *CBE–Life Sciences Education*, 15(4), ar69. doi: <https://doi.org/10.1187/cbe.16-07-0219>.
- Scardamalia, M. & Bereiter, C. (2006) Knowledge building: Theory, pedagogy, and technology. In Sawyer, R. K. (ed) *The Cambridge handbook of the learning sciences*. Cambridge, UK: Cambridge University Press, 97–118.
- Schell, G. & Janicki, T. J. (2013) Online course pedagogy and the constructivist learning model. *Journal of the Southern Association for Information Systems*, 1(1), 26–36

- Scotland, J. (2012) Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, 5(9), 9–16.
- Seel, N. M. (2011) *Encyclopedia of the sciences of learning*. New York, NY: Springer.
- Selim, H. M. (2007) Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*, 49(2), 396–413.
- Sharma, G. R. K. (2006) *Cyber livestock communication and extension education*. New Delhi, India: Concept Publishing.
- Sherblom, J. C., Withers, L. A. & Leonard, L. G. (2013) The influence of computer-mediated communication (CMC) competence on computer-supported collaborative learning (CSCL) in online classroom discussions. *Human Communication*, 16(1), 31–39.
- Shiraz, M. & Qaisar, S. (2017) Mathematics teachers' beliefs and their practices towards collaborative learning in public and private schools: A comparative case study. *Journal of Educational Research*, 20(2), 95–112.
- Siddiqui, M. H. (2009) *Models of teaching*. New Delhi, India: APH Publishing.
- Siemens, G. (2005) Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1). Available online: [http://www.itdl.org/Journal/Jan\\_05/index.htm](http://www.itdl.org/Journal/Jan_05/index.htm)
- Slavin, R. E. (2012) *Educational psychology: Theory and practice*, 10<sup>th</sup> edition. Boston, MA: Pearson Education.
- Sloane, T. O. (2001) *Encyclopedia of rhetoric*, vol. 1. Oxford, UK: Oxford University Press.
- Smith, B. & MacGregor, J. (2017) What is an online learning collaborative? *Psychiatric News*, 52(7).
- Smith, L. & Aboummoh, A. (2013) *Higher education in Saudi Arabia: Achievements, challenges and opportunities*. New York, NY: Springer.
- Springer. (2021) *International Journal of Computer-Supported Collaborative Learning: An official publication of the International Society of the Learning Sciences*. Available online: <https://www.springer.com/journal/11412> [Accessed 03/04/2021].
- Stahl, G. (2015) *Global introduction to CSCL*. Gerry Stahl [self-published].
- Stanley, D. & Zhang, Y. J. (2020) Collaborative learning in online business education: Evidence from a field experiment. *Journal of Education for Business*, 95(8), 506–512.
- Stodberg, U. & Lindqvist, M. H. (2017) A municipal implementation of a new learning management system in K-12 schools: The teacher perspective. In *Proceedings of the International Conference on Information Communication Technologies in Education 2017*. Rhodes, Greece, 6-8 July 2017, 33–42.
- Stolk, J. & Harari, J. (2014) Student motivations as predictors of high-level cognitions in project-based classrooms. *Active Learning in Higher Education*, 15(3), 231–247.
- Storberg-Walker, J. (2005). Communities of Practice and Situated Learning: A Theoretical Examination of a Shift in Individual Power. *Adult Education Research Conference*. <https://newprairiepress.org/aerc/2005/papers/5>
- Strang, K. D. (2015) Effectiveness of instructor-led collaborative learning in the classroom. *Journal of Applied Research in Higher Education*, 7(2), 134–145.
- Strijbos, J-W., Kirschner, P. A. & Martens, R. L. (2004) *What we know about CSCL: And implementing it in higher education*. Dordrecht, Netherlands: Springer Science & Business Media.

- Sung, Y. T., Yang, J. M. & Lee, H. Y. (2017) The effects of mobile-computer-supported collaborative learning: Meta-analysis and critical synthesis. *Review of Educational Research*, 87(4), 768–805.
- Sweller, J. (1999) *Instructional design in technical areas*. Melbourne, Australia: ACER Press.
- Teachers with Apps. (2015) The difference in cooperative learning and collaborative learning. *Teachers with Apps* [Online]. Available at: <https://www.teacherswithapps.com/the-differences-in-cooperative-learning-collaborative-learning/> [Accessed 14/07/2021].
- Tesavrita, C., Suryadi, K., Wiratmadja, I. I. & GovinDaraju, R. (2017) Intra-organizational and inter-organizational knowledge sharing in collaborative learning process: A conceptual framework for SME. *Paper presented at 2017 4<sup>th</sup> International Conference on Industrial Engineering and Applications*. Nagoya, Japan, 21-23 April 2017.
- Thompson, R. L., Higgins, C. A. & Howell, J. M. (1991) Personal computing: Toward a conceptual model of utilization. *MIS Quarterly*, 15(1), 125–143.
- Trietiak, A. (2022) *Online collaborative learning in higher education: A review of the literature* [Online]. Available at: <https://edspace.american.edu/amytrietiak/2020/05/07/online-collaborative-learning-in-higher-education/> [Accessed 10/05/2022].
- Trowler, V. (2010) *Student engagement: A literature review*. Lancaster University: The Higher Education Academy.
- Tsai, C. W. (2011) Achieving effective learning effects in the blended course: A combined approach of online self-regulated learning and collaborative learning with initiation. *CyberPsychology, Behavior & Social Networking*, 14(9), 505–510. doi: <https://doi.org/10.1089/cyber.2010.0388>.
- Tu, W. (1985) *Confucian thought: Selfhood as creative transformation*. Albany, NY: SUNY Press.
- Tubaishat, A., Bhatti, A. & El-Qawasmeh, E. (2006) ICT experiences in two different Middle Eastern universities. *Issues in Informing Science and Information Technology*, 3, 667–678.
- Tukey, J. W. (1977). *Exploratory data analysis*. Reading, Mass: Addison-Wesley.
- Turki, F. J., Jdaitawi, M. & Sheta, H. (2017) Fostering positive adjustment behaviour: Social connectedness, achievement motivation and emotional-social learning among male and female university students. *Active Learning in Higher Education*, 19(2), 145–158.
- Turner, D. A. (2005) *Theory of education*. New York, NY: Continuum.
- UNESCO. (2016) UNESCO and the Kingdom of Saudi Arabia reinforce cooperation to drive education reform. *UNESCO Media Services*. Available online: [http://www.unesco.org/new/en/media-services/single-view/news/unesco\\_and\\_kingdom\\_of\\_saudi\\_arabia\\_reinforce\\_cooperation\\_to/](http://www.unesco.org/new/en/media-services/single-view/news/unesco_and_kingdom_of_saudi_arabia_reinforce_cooperation_to/) [Accessed 02/07/2017].
- UOE. (2017) Online distance learning (ODL) policy. *The University of Edinburgh*. Available online: [www.ed.ac.uk/files/atoms/files/online\\_distance\\_learning.pdf](http://www.ed.ac.uk/files/atoms/files/online_distance_learning.pdf) [Accessed 12/07/2017].
- UOH. (2021) *University of Hail, Preparatory Year, About Us*. Available online: <http://www.uoh.edu.sa/en/Subgates/Deans/Prep-Year/About/Pages/Default.aspx> [Accessed 26/02/2021].
- Valamis. (2022) What is collaborative learning? Theory, examples of activities. *Valamis* [Online]. Available at: <https://www.valamis.com/hub/collaborative-learning> [Accessed 10/05/2022].
- van Leeuwen, A. & Janssen, J. (2019) A systematic review of teacher guidance during collaborative learning in primary and secondary education. *Educational Research Review*, 27, 71–89
- Veerman, A. (2000) *Computer supported collaborative learning through argumentation*. PhD thesis. Utrecht University.

- Venkatesh, V., Morris, M., Davis, G. B. & Davis, F. D. (2003) User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–78.
- Vygotsky, L. S. (1978) *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Warsah, I., Morganna, R., Ulyun, M., Hamengkubuwono & Afandi, M. (2021) The impact of collaborative learning on learners' critical thinking skills. *International Journal of Instruction*, 14(2), 443–460.
- Webb, N. M., Ing, M., Kersting, N. & Nemer, K. M. (2006) Help seeking in cooperative learning groups. In Karabenick, S. A. & Newman, R. S. (eds) *Academic help seeking: Goals, groups and contexts*. Mahwah, NJ: Erlbaum, 45–88.
- Weller, M. (2002) *Delivering learning on the Net: the why, what and how of online education*. London: Routledge Falmer.
- Wenger, E. & Snyder, W. (2000) *Communities of Practice: The Organizational Frontier*. Harvard Business Review, pp. 139-145.
- Xu, J. F. & Xu, L. (2004) Exploring college English teachers' roles in the autonomous learning mode. *Higher Education Research*, 3, 77–79.
- Yang, N., Ghislandi, P. & Dellantonio, S. (2018) Online collaboration in a large university class supports quality teaching. *Education Technology Research & Development*, 66(3), 671–691.
- Yeung, A., Jin, P. & Sweller, J. (1998) Cognitive load and learner expertise: Split attention and redundancy effects in reading with explanatory notes. *Contemporary Educational Psychology*, 23(1), 1–21.
- Yin, R. K. (2003) *Case study research: Design and methods*, 3<sup>rd</sup> edition. Thousand Oaks, CA: Sage.
- Yin, R. K. (2018) *Case study research and applications: Design and methods*, 6<sup>th</sup> edition. Thousand Oaks, CA: Sage.
- Yu, Y. (2013) The effectiveness of collaborative learning: A case study of academic summary. *Proceedings of the 2013 International Conference on Advanced Mechatronic Systems*. Luoyang, China, 25-27 September 2013. New York, NY: IEEE, 396–399.
- Yu, Z. (2021) The effects of gender, educational level, and personality on online learning outcomes during the COVID-19 pandemic. *International Journal of Educational Technology in Higher Education*, 18(14). doi: <https://doi.org/10.1186/s41239-021-00252-3>.
- Yucel, U. A. & Usluel, Y. K. (2016) Knowledge building and the quantity, content and quality of the interaction and participation of students in an online collaborative learning environment. *Computers & Education*, 97, 31–48.
- Yusop, F. D. & Abdul Basar, S. M. M. (2017) Resistance towards wiki: Implications for designing successful wiki-supported collaborative learning experiences. *Universal Access in the Information Society*, 16(2), 349–360.
- Zambrano, J., Kirschner, F., Sweller, J. & Kirschner, P. A. (2019) Effects of group experience and information distribution on collaborative learning. *Instructional Science*, 47, 531–550. doi: <https://doi.org/10.1007/s11251-019-09495-0>.
- Zanjani, N., Edwards S. L., Nykvist, S. & Geva, S. (2016) LMS acceptance: The instructor role. *Asia-Pacific Educational Resources*, 25(4), 519–526.
- Zanjani, N., Nykvist, S. S. & Geva, S. (2012) Do students and lecturers actively use collaboration tools in learning management systems? In Wong, L. H., Chen, W., Biswas, G. & Hirashima, T.

(eds) *Proceedings of the 20th International Conference on Computers in Education, ICCE 2012*. Nanyang Technological University, Singapore: National Institute of Education, 698–705.

- Zheng, B., Niiya, M. & Warschauer, M. (2015) Wikis and collaborative learning in higher education. *Technology, Pedagogy and Education*, 24(3), 357–374.
- Zhu, C. (2011) Online collaborative learning: Cultural differences in student satisfaction and performance. *Journal for Educational Research Online (Journal Für Bildungsforschung Online)*, 3(1), 12–28.
- Zhu, C., Valcke, M. & Schellens, T. (2010) A cross-cultural study of teacher perspectives on teacher roles and adoption of online collaborative learning in higher education. *European Journal of Teacher Education*, 33(2), 147–165.

## APPENDICES

### **Appendix A: Observation Targets**

#### **Fixed observations**

- Physical setting – descriptions of the two settings (CSCL and TCL/non-CSCL)
- Participants – descriptions of the two groups of participants
- Programme – details of the tasks given to each group of participants
- Tools – descriptions of the learning tools used by the groups and how they are used
- Objects – artefacts and other physical things present in the environment
- Other observations

#### **Non-fixed observations**

- Activities – notable collaborative activities the students engage in to help them learn
- Events – important milestones and other notable events during the collaboration
- Behaviour – what the participants do during the course of learning
- Interactions – the manner of the students' interactions with each other

See also the table on indicators (Table 14).

## **Appendix B: Interview Questions**

Predefined questions for guiding the interviews:

### **Collaborative learning**

- What is the definition of collaborative learning?
- What is your opinion of collaborative learning? What do you think of it as a way of learning?
- Have you had any previous experience of learning collaboratively before this study? If so, please describe your experience.
- Do you think collaborative learning should be promoted and its adoption made more widespread in Saudi Arabia? If not, why not?
- What do you think facilitates or hinders collaborative learning among students?
- Do you believe collaborative learning has the potential to enhance learning? Or, if not, then what are its weaknesses or limitations?

### **Computer-supported collaborative learning**

- Do you have any previous experience of using computer-based collaborative learning tools? If so, which ones have you used, how frequently do you use them, and how proficient are you in using them?
- Which tools have you found to be effective, and what is it that makes them effective for supporting collaboration and learning?
- What do you think facilitates or hinders the use of CSCL tools by students and teachers?
- Do you feel the university provides you with adequate CSCL tools? If not, then why do you think this might be the case?
- For what cases, or for learning which subjects or doing which type of learning activities do you consider CSCL tools to be useful and effective? And, in which of them are they not suitable in your view?
- How do you foresee the use of CSCL tools in universities in Saudi Arabia? Will their adoption expand or be reduced, and why?

### **Observation period in this study**

- Were you aware of what you had to do, i.e., the learning objectives, and how these were to be achieved?
- Were you able to make the contributions you wanted to make, or if not, then what prevented you from making them?
- What were your own individual contributions during these collaborations?

- How did you find the overall experience of collaborating during this study? Was it a worthwhile experience?
- Do you believe the collaborative learning session you underwent in this study assisted you in your learning? If so, how or in what ways, or if not, then why do you think this was the case?

### **Appendix C: Outline of Research Steps**

Outline of the research steps to be followed for applying the methodology of this study, including what will be specifically looked for during the observations, how the focus groups will be organised.

#### **Pilot Study**

For the pilot study, the same procedure as outlined before will be carried out for observations and interviews, except that these will only be done once for one class and one teacher. Points will be noted from the pilot study to help refine the instruments if necessary.

#### **Observations**

The observations have been divided into two kinds: fixed observations, which only need to be noted once either before the class session or during moments of inactivity, and dynamic observations, which are likely to have multiple instances and will have to be noted during the observations as and when they occur, or some things noted afterwards.

Fixed observations (pre-session):

- Physical setting – descriptions of each of the two settings (technical class and non-technical class)
  - Physical/Visible features of the classroom environment
  - Whether natural or arranged/laboratory
  - How the setting is normally used by the students
- Participants – descriptions of the two groups of participants
  - Physical characteristics of the students such as age, gender (all male), ethnicity and clothing
  - Other relevant characteristics such as education, personality, attitude, temperament and familiarity
- Programme – details of the tasks given to each group of participants
  - Given task – What the students have been tasked to do
  - Goals – What the participants are trying to achieve
- Objects – artefacts and other physical things present in the environment
  - The presence of those objects that impact on the behaviour of the collaborating students
  - The placement and arrangement of those objects
  - Cultural artefacts used by the students that might affect their ideas, values and attitudes

- Tools – descriptions of the learning tools used by the groups and how they are used
  - The tools to be used by the students
  - The way the tools are designed to be used

Non-fixed/Dynamic observations (while collaborating):

- Activities – notable collaborative activities the students engage in to help them learn
  - The set of acts taking place during the observations
  - Sequence of activities
- Events – important milestones and other notable events during the collaboration
  - Notable happenings and incidents during the collaboration
  - Important milestones achieved by the students
- Behaviour – what the participants do during the course of learning
  - How the students felt and expressed themselves
  - Any notable unexpected behaviours
- Interactions – the manner of the students’ interactions with each other
  - How the students interact with each other
  - What the students do in learning collaboratively

### **Interviews**

The interview questions to be asked to the interview participants are set out in Appendix C. Individual interviews are to be arranged with the teachers, and focus groups with the two classes of students. If the classes are too large, then they may be divided into sub-classes as appropriate.

### **General Outline of Steps**

Table 23 below gives a general outline of steps for the data collection.

**Table 34: General outline of steps for data collection**

Stage	Steps
Pilot study	<ol style="list-style-type: none"> <li>1. Arrange for pilot observations with a class of students.</li> <li>2. Conduct the pilot observations.</li> <li>3. Arrange for focus group interview with the observed class of students.</li> <li>4. Conduct the focus group interview.</li> <li>5. Arrange for the teacher interview.</li> <li>6. Conduct the teacher interview.</li> </ol>
Refinement of instruments	<ol style="list-style-type: none"> <li>1. Check the observation notes, interview notes, and focus group interview notes for possible improvements to capture the required data.</li> <li>2. Amend the research instruments in light of the above.</li> </ol>
Conduction of observations	<ol style="list-style-type: none"> <li>1. Arrange for first class observations (non-technical group, TCL/non-CSCL).</li> <li>2. Make the ‘fixed observation’ notes before the session.</li> <li>3. Make the remainder observation notes during the session.</li> </ol>
Further observations	<p>Conduct the remaining three observations in the same manner:</p> <ol style="list-style-type: none"> <li>1. Technical group using TCL/non-CSCL</li> <li>2. Non-technical group using CSCL tool</li> <li>3. Technical group using CSCL tool</li> </ol>
Focus group interviews	<ol style="list-style-type: none"> <li>1. Arrange the focus group interviews.</li> <li>2. Conduct the focus group interviews with the students for each group.</li> </ol>
Teacher interviews	<ol style="list-style-type: none"> <li>1. Arrange for the teacher interviews.</li> <li>2. Conduct interviews with the two teachers whose classes were observed.</li> <li>3. Conduct further interviews with other teachers whose classes were not observed.</li> </ol>

## **Appendix D: Keyword Findings**

### **Definitions of collaborative learning**

The following keywords were identified in the responses of the interviewees:

**Vague classifications:** type of education; method of modern teaching strategy

**Precise classifications:** integrative role-based education; self-education; brainstorming

**Process:** collaboration/Educational process; participation by students; question-to-answer

**Grouping:** distribution in groups; grouping of students

**Involvement/Purpose:** creation of learning material; discussion between students; discussion of a topic; understanding through discussion; solving a task; to arouse enthusiasm; to support learning; information sharing; interaction; gathering of ideas; gathering/presentation of views; development/summarisation of lesson

**Expected outcome:** solving a task; get information; acquire new/different information; have information corrected; get an answer; produce an idea/product

### **Potential benefits according to teachers and lecturers**

The following keywords were identified in the responses of the interviewees:

**CL method:** easier than traditional methods; effective ('high/quick outputs'); likened to brainstorming; generates many ideas; makes lecture full/informative; can be applied for any educational material; services classroom/constructive theory; modern/easy/flexible method

**CL tools:** blog - shared information appears to others; forum – discussion; submitting ideas

**Learning:** supports learning; capacity to support learning; covers learning gaps; more concentration; achievement of desired objectives; for learning how to learn; supports/encourages self-learning; learner-centred learning; active learning; increases learning; teamwork leads to learning; part of constructionist learning; makes students understand ideas well; remember information better

**Knowledge:** more/much knowledge; helps in search for information; supports knowledge-sharing; new perspectives; builds new knowledge

**Skills:** useful for acquiring skills; increases acquisition of skills; communication skills; teamwork; new skills

**Experiences:** more experience

**Learning outcome/objectives:** improved achievement; improve on a colleague's idea; easy achievement of objectives

**Students:** well-distributed; 'immediate effect' on students;

**Student attitudes/feelings:** eliminates shyness/inattention; motivates students; more motivation/encouragement/enthusiasm; motivates students; gives self-confidence; discharges students' energies; makes students like curriculum/university; instils spirit of competition/diligence; allows competing; makes student proactive; gives opportunity to express themselves; encouragement; removes boredom; attracts attention; makes student concentrated; builds personality; learner acquires a personality/productivity/positivity

**Interaction and teamwork:** support interaction/cooperation; build concept together; succeed together; gives all students a chance; can see/talk with colleagues; solve problems together; peer learning maximises benefits; students learn from others; group participation and dialogue; gain knowledge/skills

**Communication:** greater communication; less ashamed to ask; more opportunity to ask

**Time:** takes less time; overcomes time constraints

**Space:** overcomes space constraints

**Teachers:** greater opportunity to guide

#### Potential benefits according to students

The following keywords were identified in the responses of the interviewees:

**Method:** modern; for era of technology; easy/flexible for passing information; students pay attention; easier to depend on other students; gives opportunity to participate; reduces time; time and effort saving; no need for books/searching in libraries; effective atmosphere; no distraction; meaningful; less complex

**Knowledge/Information:** helps get new/additional information; more accurate information; mistakes can be modified; students remember faster; harder to forget; can get information without being ashamed to ask; can know information from colleagues; not just one source; makes students think about the information; can develop information properly; can share information quickly

**Learning:** easier for both; helps in understanding faster; facilitates learning process

**Teacher-Student interaction:** makes students interact; students pay attention; students work better with their teachers; easy to reach professor

**Student-Student interaction:** allows for interactions/brainstorming; depends on discussions; ideas increase; helps students discuss ideas; ideas can be gained quickly; teamwork breaks barriers; broadens horizons; improves cooperation; all students can participate; can deduce various views; can make friends; students share and solve problems together; can understand together; spirit of cooperation; gaining of new skills

**Additional benefits for students:** useful for self-development; limits shyness; even the shy can participate; more self-confidence

Barriers, obstacles and hindrances

The following keywords were identified in the responses of the interviewees:

**Institutional:** no model to follow; lack of implementation controls and mechanisms

**Curriculum/Lessons:** unreceptive curriculum; unsuitable lessons; lack of continued guidance

**Teacher background:** no previous experience; inadequate skills of faculty; lack of qualification/experience; no specialised skills; lack of training (of faculty members); lack of interest by faculty member

**Teacher issues:** inadequate time for teachers; load on teachers; lack of incentives for teachers

**Rooms/Equipment:** unavailability of labs; unequipped rooms

**Tools:** Lack of or inappropriate tools, especially social networking sites; lack of ability to customise them; inappropriate use of tools; untrustworthy tools; technical editions of Blackboard

**Computers/Internet:** unavailability of computers/high-speed internet; computer maintenance deficiencies; slow/poor connections and disconnections from the internet

**Devices:** unavailability of devices; damaged devices; device failure; inadequate storage/cloud space

**Resistance/Reluctance:** resistance of students; resistance to adopting new methods; resistance to change; reluctance to group students; inactive students

**Student weaknesses:** shyness, carelessness, learning difficulties, boredom, lack of enthusiasm; lack of credibility

**Student attitudes:** lack of integration; lack of interest; miscommunication or lack of good communication between students

Barriers for students

The following keywords were identified in the responses of the interviewees:

**Technical:** technical failures: computer malfunction; slow internet; bad connection; poor network

**Tools/Provision:** unavailability; no assistance

**Personal:** shyness; reluctance; fear; carelessness; lack of self-confidence; need convincing - don't see how CL is better; preference for traditional method; inconsistent views; pride and ethics; distraction; too busy in thoughts; health concerns

**Social:** poor cooperation; uncooperative students/people; limited time; stress; cultural differences

**Knowledge/Skills:** knowledge, skills and experience: unfamiliarity with using the computer; inability to utilise computers for learning; individual abilities

**Environment:** unsuitable environment

Provision, support and receptiveness

**Strengths:** educational resources and means; software; internet; computer laboratories

**Shortcomings:** desktops, internet, university laptops, training, implementation controls and mechanisms, not caring about students

Facilitation of collaborative learning

The following keywords were identified in the responses of the interviewees:

**University:** Encouragement by the university; incentives; inspiring stories

**Training:** training of teachers; workshops; trainers; training courses of institutions; courses on dealing with computers/collaboration; training to motivate students

**Counselling:** Counselling of teachers on barriers/obstacles; research on obstacles from previous studies

**Teacher's attributes:** teacher's belief; professor's personality

**Teacher's skills/experience:** knowledge about the technology; experience in managing discussions; familiarity with matter

**Grouping:** grouping with roles; balanced groups; small/restricted groups; few students per group (5-6/12-15 max); few groups (3-4 max), selection of leader; [mixed-ability grouping]; working as a team; heterogeneous groups; homogeneous students; changes in groups

**Environment/Atmosphere:** Supportive environment: room size; colour; posters; lighting; air conditioning; clean room; access to knowledge/information; availability of labs; [adaptive environment]; competitive atmosphere; competition between students

**Other arrangements:** teacher's dressing, breaks with drinks

**Furniture:** well-designed furniture, cabinets for students

**Equipment:** Equipped classes; availability of devices; access to devices; availability of computers/internet; internet; high-speed internet; projector; smart hardware; innovative technology; modern, accessible/easy/simple/effective devices

**Tools:** discussion-based tools; tools that support group discussion/interaction/chatting; accessible tools; tools inside the classroom; forum/wiki (as asynchronous); clear and available tools; package of tools; new tools; audio/video discussion/dialogue/videoconferencing (as synchronous); simple design; VLE; Second Life; Facebook; motivating webpage; easy to use program

**Technical support**

**Materials:** suitable materials; short videos

**Tasks/Roles:** Clarity of tasks/roles/activities; multi-tasks; dividing objectives; clarity of teaching method; coordination before a videoconference; specific goals

**Information/Planning:** Information to students; 'clarity of image'; helping them understand; learning standards; planning; strategy

**Training of students:** training on making discussion, for motivation, clarification, etc.; trained to use tools quickly; introduction of devices; typing skills; mentoring by teacher

**Encouragement/Motivation:** encouragement to participate; motivation; interest; instilling the spirit of collaboration; incentives; opportunity to fix mistakes; ability to modify information; asking explanatory questions

**Intervention:** lecturer intervention; 'Indirect interference'

**Guidance/Supervision:** supervision of students; [facilitation]; monitoring; supervisors for students; control and guidance; ensuring clear responses/interaction/exchange of views;

**Learning:** learning methods; diversity of learning methods; doing homework; including students in the method

**Follow-up:** Reports; Follow-up by evaluators; feedback; performance evaluation

Past experiences of collaborative learning

**How far back** (students): since elementary school; since high school

**Types of experiences:** traditional CL (without using a computer), computer-based but not CL; CSCL

**What it enables:** allows for different/sharing views; quick communication; encourages discussion; students are more responsive and thoughtful; allows for questioning; can get extra information; allows for brainstorming; students can express themselves

**Restrictions experienced by students:** did not support self-development as now; some students get more benefits from colleagues than the teacher

**Restrictions experienced by teachers:** have to “complete the curriculum”

**Overall experience** (of students): “a paradigm shift”, “amazing”, “a wonderful period”, “a rich experience”, “an exciting experience”

**Teachers’ experiences of traditional CL:** “an excellent experience” – benefited directly, but took time

**Teachers’ experiences of CSCL:** “more positive results”, “a paradigm shift”; most effective are audio/video debate and virtual classroom; used for testing only; “wonderful”; “rich experience”; “amazing for students”

**Benefits experience by teachers:** led to discovery learning; “an exciting experience”; allows to search and discuss; can “hear from all students”; students can discover new skills; can be used to teach how to search; can help students develop communication skills and self-development; gives opportunities for questioning

Present/ongoing experiences of collaborative learning

**Effective tools:** forum; Blackboard with video conferencing; Google Docs; brainstorming; peer learning; role-playing; use of the internet

**Effective methods:** collective discussions; incentives and encouragement; competition; allowing students to express themselves and their different points of view; giving students “basics” before grouping them; distributing lesson ideas; putting particular questions; taking students’ impressions; “behavioural and procedural objectives” before the lesson; dialogues and discussions “were significant”

**Positive aspects** (student learning): increases spirit of learning; made students interested to learn; makes students focused on the topic; students gained more capacity to understand the lesson; learning outputs improved for weak students; led to “significant interaction” among students; gives students new information and experiences; makes students attentive; stimulates their brains

**Other positive aspects** (general): students enjoy it; students were successful and happy; it was “a pleasure” for them; increase in self-confidence; improved communication skills; promotes good competition; “amazing” outputs that enabled to achieve the objectives; made the lecture go smoothly; no class disruption; saved a lot of time

**Negative aspects:** slow to complete the curriculum; students can get distracted;

**Requirements and restrictions:** need support and guidance of faculty and institution; CSCL succeeds in only some subjects

**Overall experience for teachers:** “a rich experience”; “a very exciting experiment”; helped achieve curriculum objectives; a “worthwhile experiment”; “more effective”; “a pleasant experience”

Future Outlook for collaborative learning

**Prospects at the university:** hope for continuation; will take time to implement; wish to provide CSCL for “faster and easier” information; CL can help low academic level students; CL can save teachers’ time; it can help motivate students, express their abilities, and overcome shyness.

**Positive outlooks for Saudi Arabia:** it will expand; it will be applied; a new generation with high communication skills; it is “an extension of your body”.

**Significantly positive outlooks for Saudi Arabia:** it will expand “significantly”; “the future of education is the future of collaborative learning and e-learning”; there will be greater reliance on CL; it is necessary for Saudi Vision 2030

**Main change drivers:** “digital transformation”; “Saudi Vision 2030”; “what the international universities do”

**Mixed outlooks:** can only be deployed if “correctly marketed” and its advantages are “disseminated properly”; some new universities don’t use it

**Appendix E: Screenshots of the Forum**

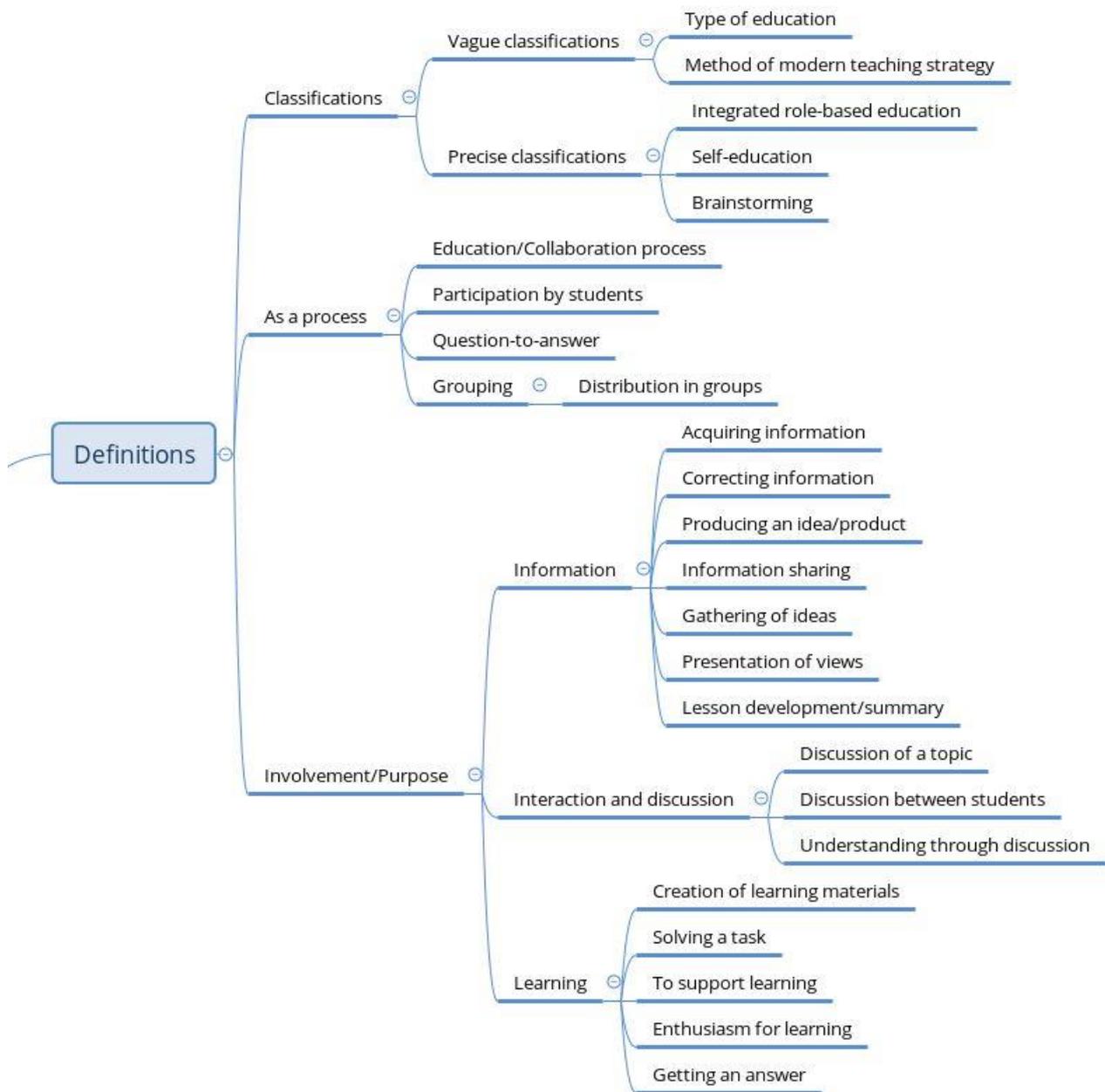
سلسلة رسائل	المؤلف	الحالة	الرسائل غير المقروءة	الردود غير المقروءة الموجهة لي	إجمالي الرسائل
		منشور	1	0	1
لماذا ندرس تكنولوجيا ؟		منشور	0	0	1
لماذا ندرس تكنولوجيا التعليم		منشور	0	0	2
تكنولوجيا التعليم؟		منشور	0	0	2
أسباب استخدام التكنولوجيا الحديثة في التعليم		منشور	0	0	3
اهمية تكنولوجيا التعليم		منشور	0	0	1
تكنولوجيا التعليم		منشور	0	0	3
تكنولوجيا التعليم		منشور	0	0	8
لماذا ندرس تكنولوجيا التعليم					

سلسلة رسائل	المؤلف	الحالة	الرسائل غير المقروءة	الردود غير المقروءة الموجهة لي	إجمالي الرسائل
		منشور	0	0	1
المزايا والعيوب :-		منشور	0	0	1
مزايا وعيوب التلفزيون التعليمي		منشور	0	0	3
التلفزيون التعليمي		منشور	0	0	4
العيوب و المميزات					

إجمالي المشاركين	الردود غير المقروءة الموجهة لي	الرسائل غير المقروءة	إجمالي الرسائل	الوصف	المنتدى
0	0	0	0		اذكر بعض من المستحدثات التكنولوجية في الوسائل وتكنولوجيا التعليم؟ لم يعد المنتدى متاحاً حتى: الأربعاء ١٥ أبريل، ٢٠٢٠ ١٠:٠٠:٠٠ م ص AST.
13	0	1	21		لماذا ندرس تكنولوجيا التعليم؟
12	0	1	14		برايك ، ماهي الخصائص العامة لتصميم الوسائل التعليمية؟
8	0	0	9	من خلال حضورك للمحاضرة اذكر اثنين من المميزات او العيوب	من خلال محاضرة اليوم ماهي اهم النقاط التي تم التطرق لها في التلفزيون التعليمي ؟ لم يعد المنتدى متاحاً حتى: الخميس ٢ أبريل، ٢٠٢٠ ١١:٥٩:٠٠ م ص AST.

Note: names in the screenshots have been redacted to protect anonymity.

**Appendix F: Mind Maps of the Themes and Sub-Themes**



**Figure 5: Mind map of themes on CL definitions**

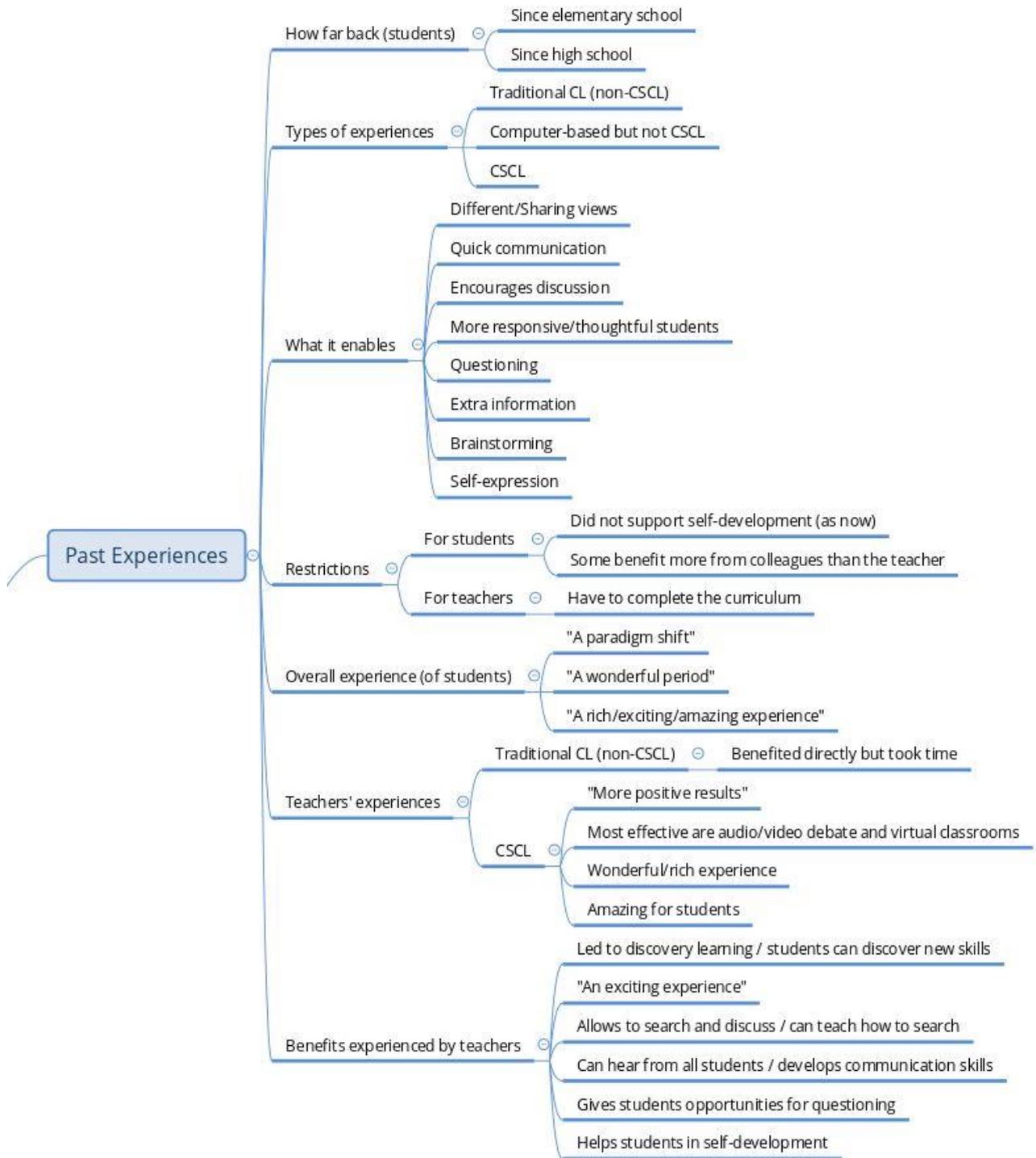


Figure 6: Mind map of themes on past experiences with CL

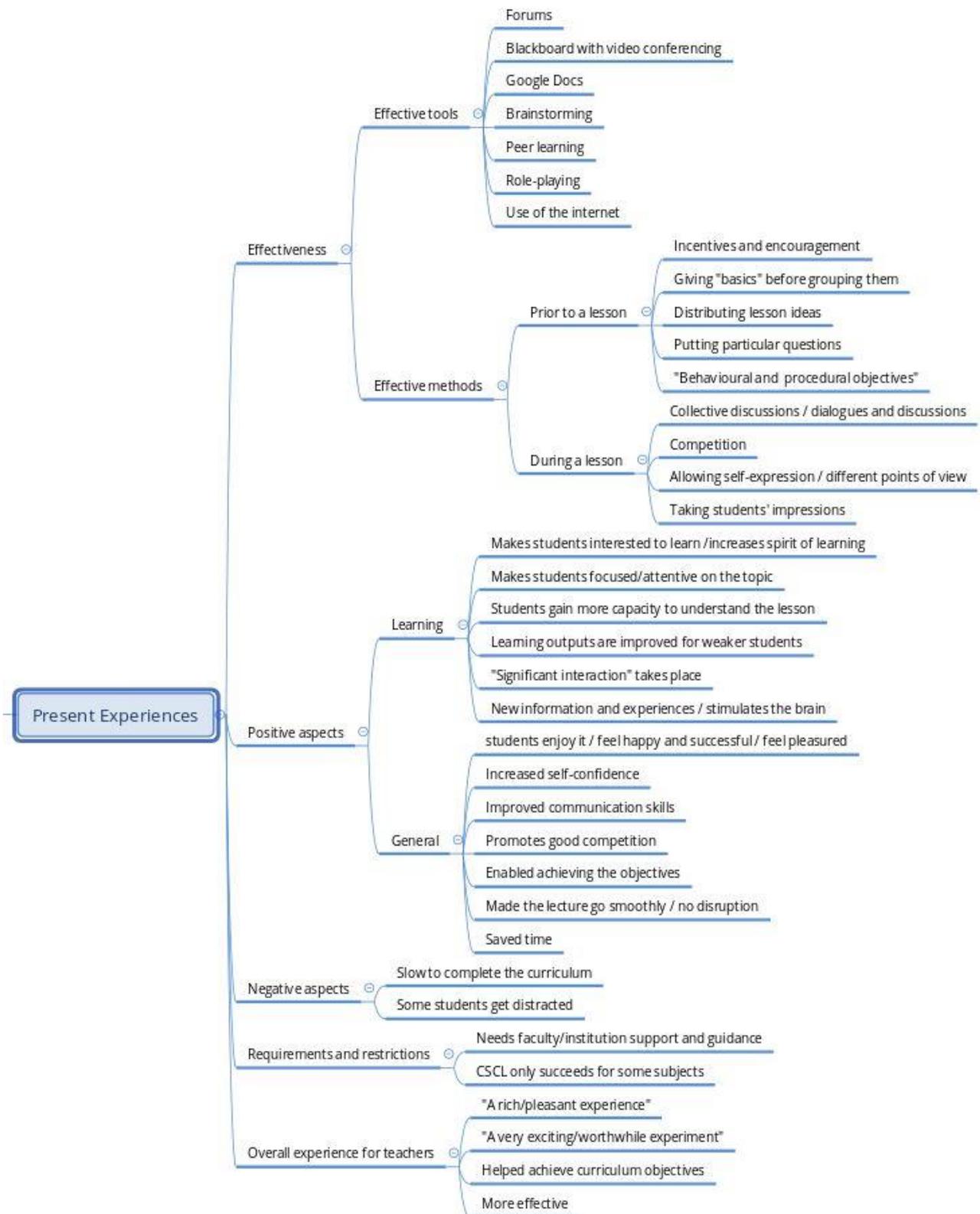


Figure 7: Mind map of themes on present experiences with CL

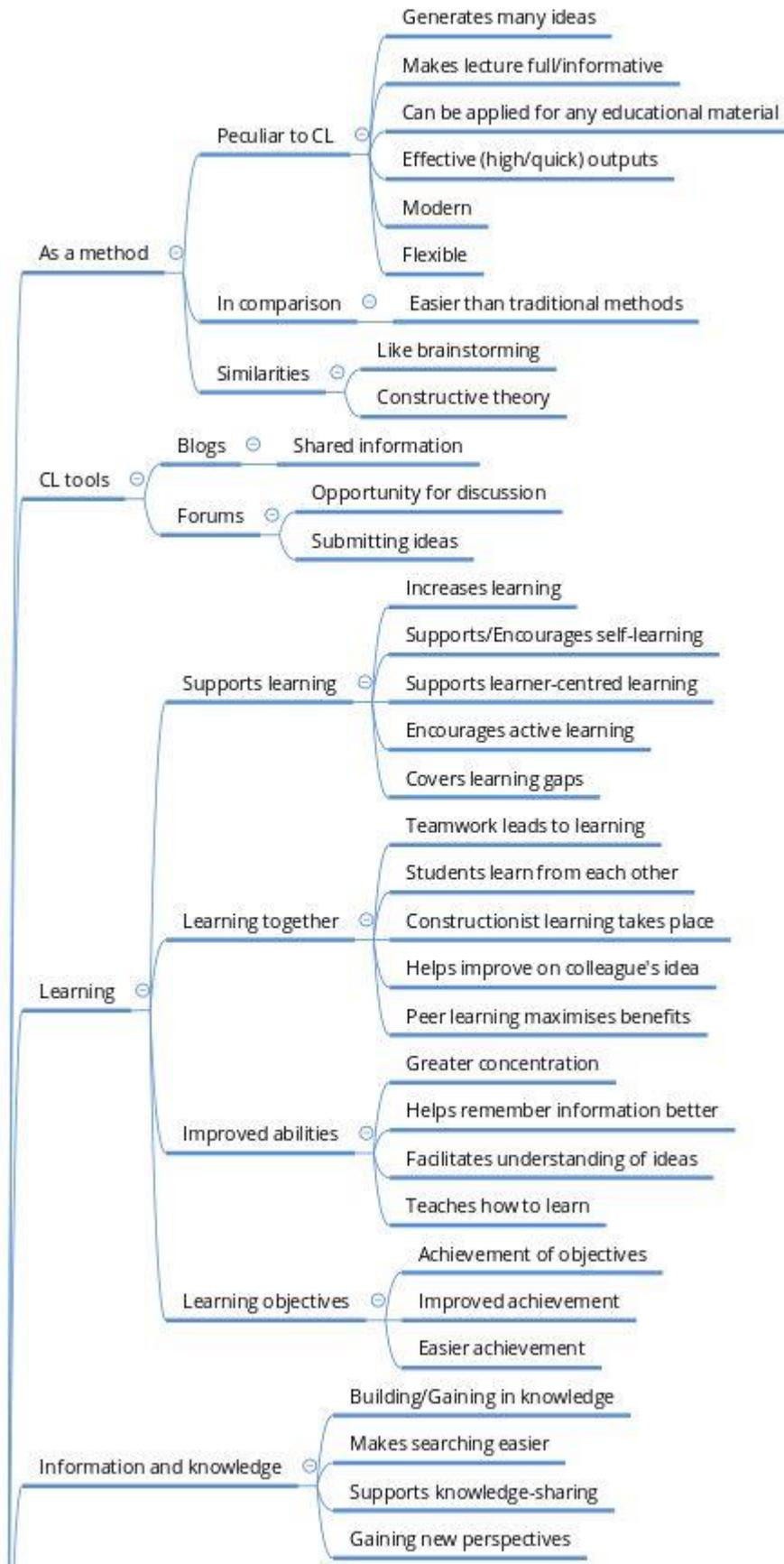


Figure 8: Mind map of themes on CL benefits perceived by teachers - part A

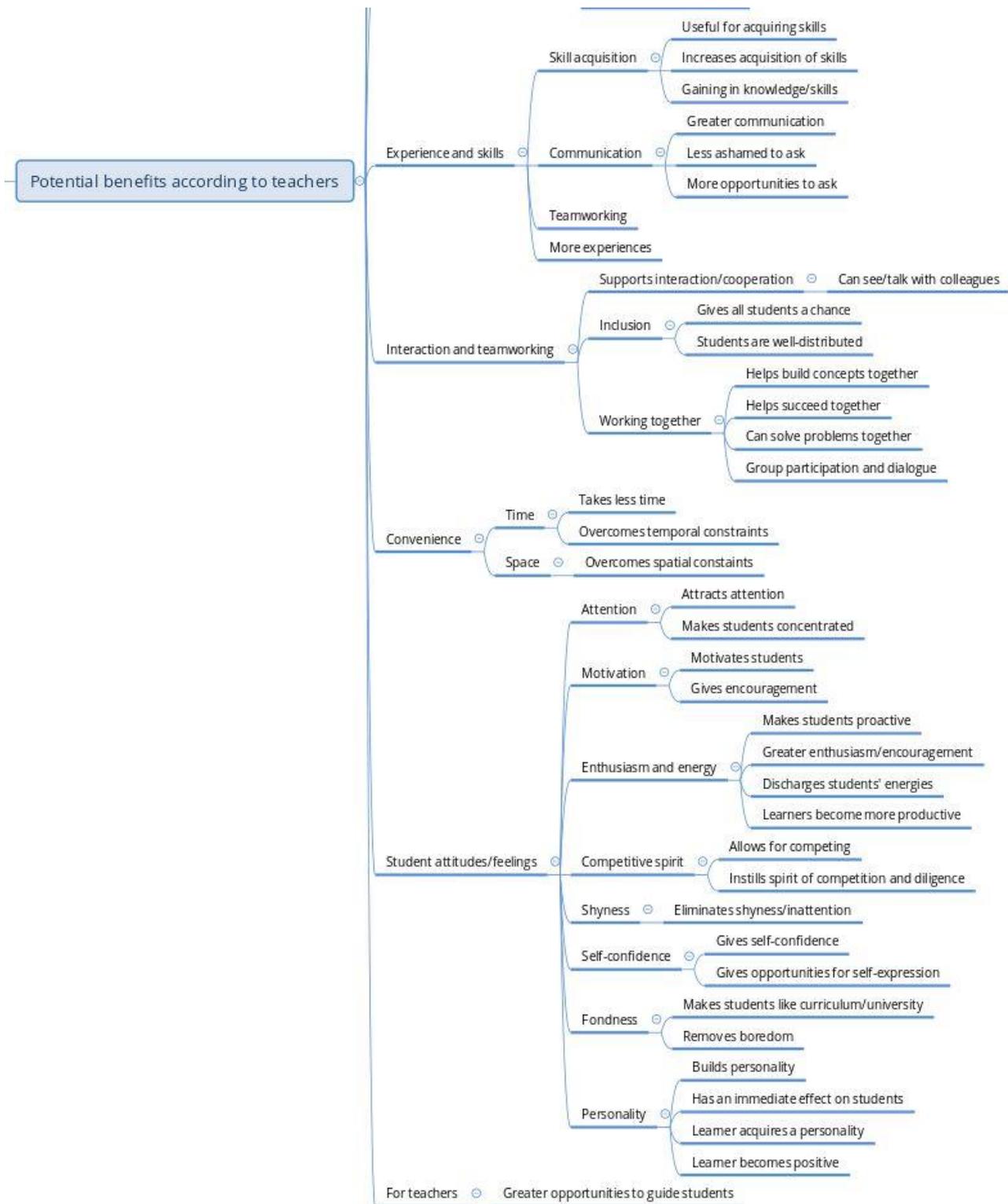


Figure 9: Mind map of themes on CL benefits perceived by teachers - part B

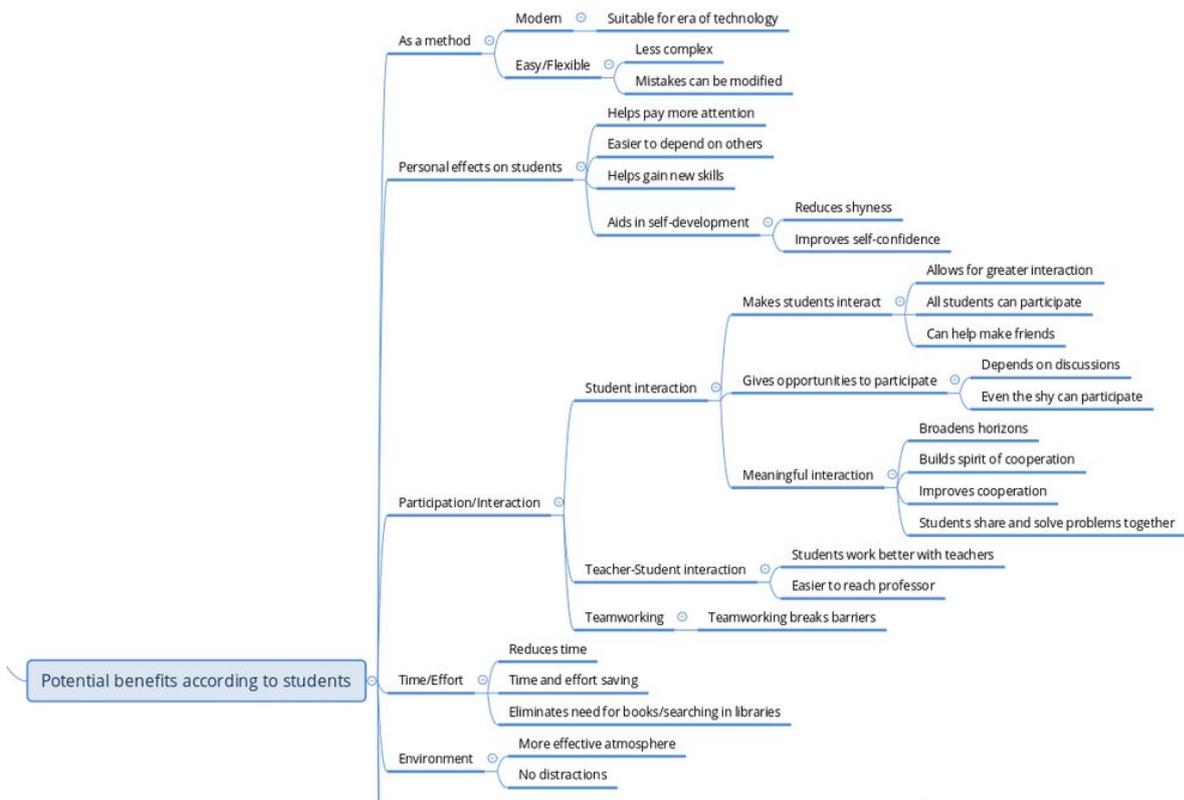


Figure 10: Mind map of themes on CL benefits perceived by students - part A

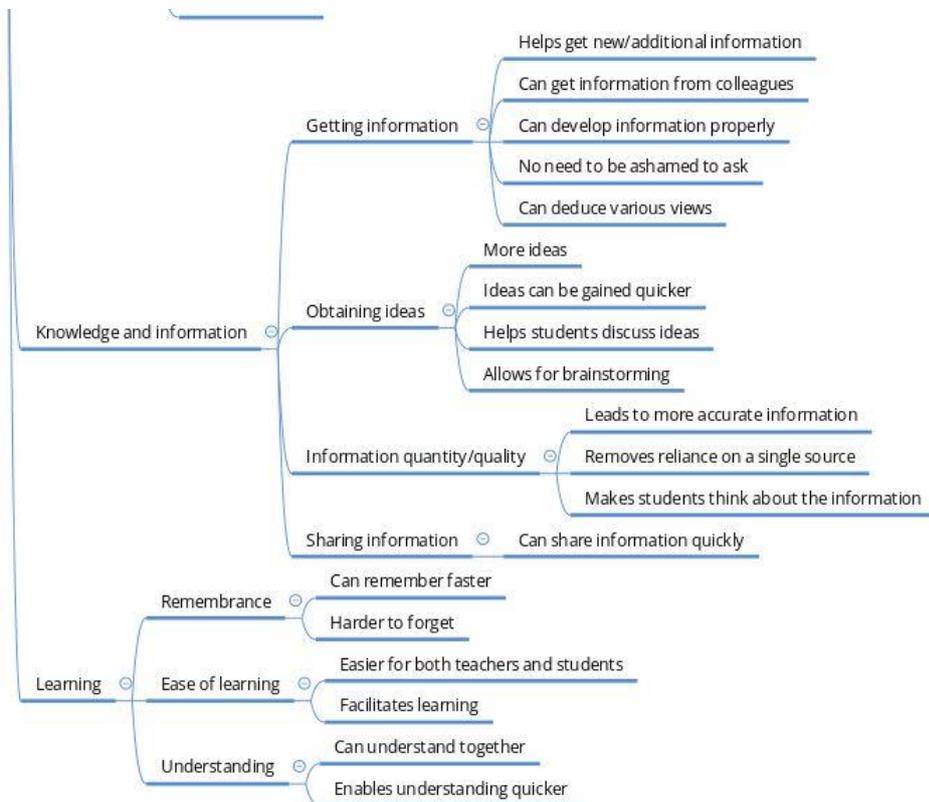


Figure 11: Mind map of themes on CL benefits perceived by students - part B



Figure 12: Mind map of themes on CL challenges - part A

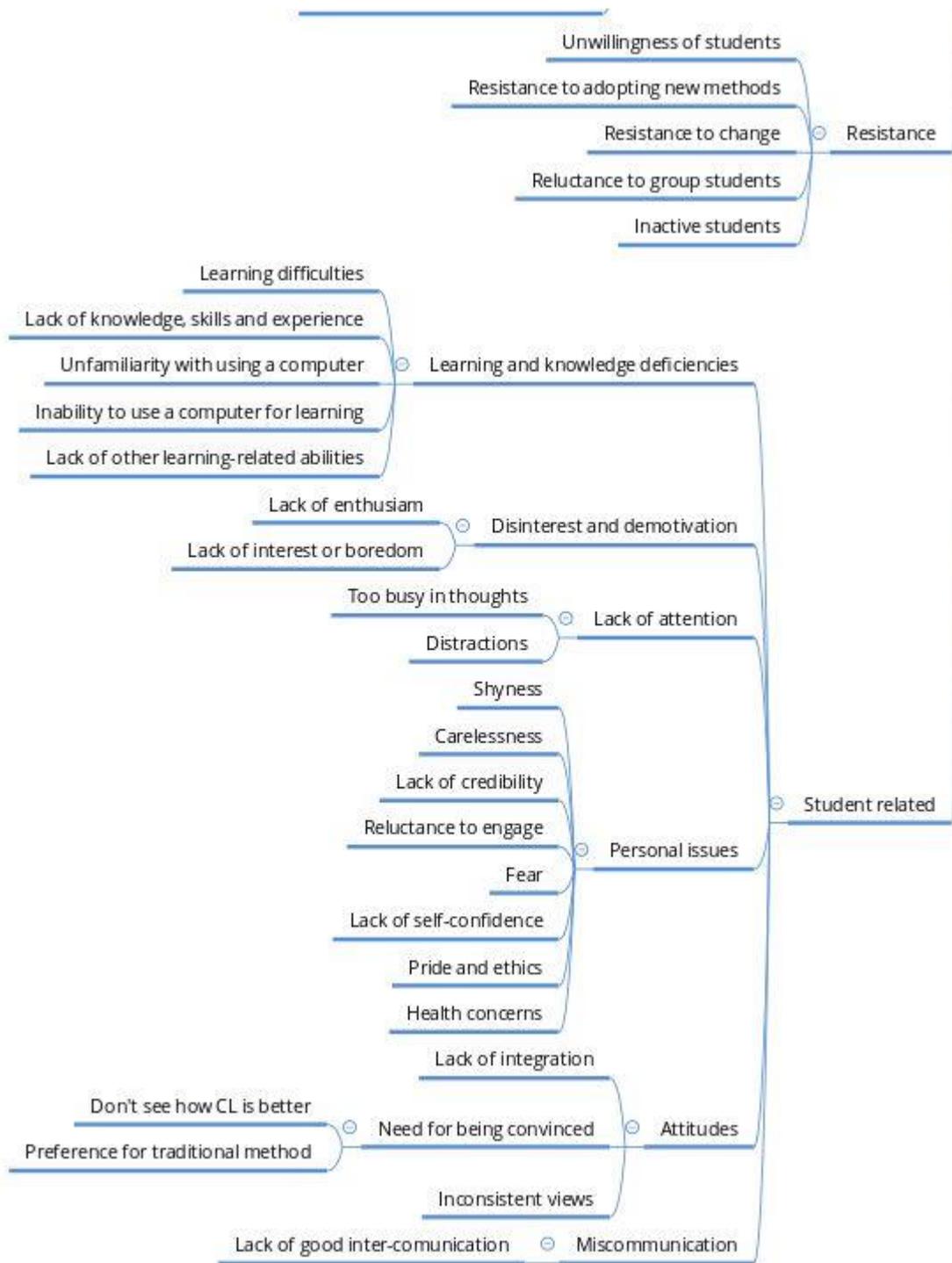
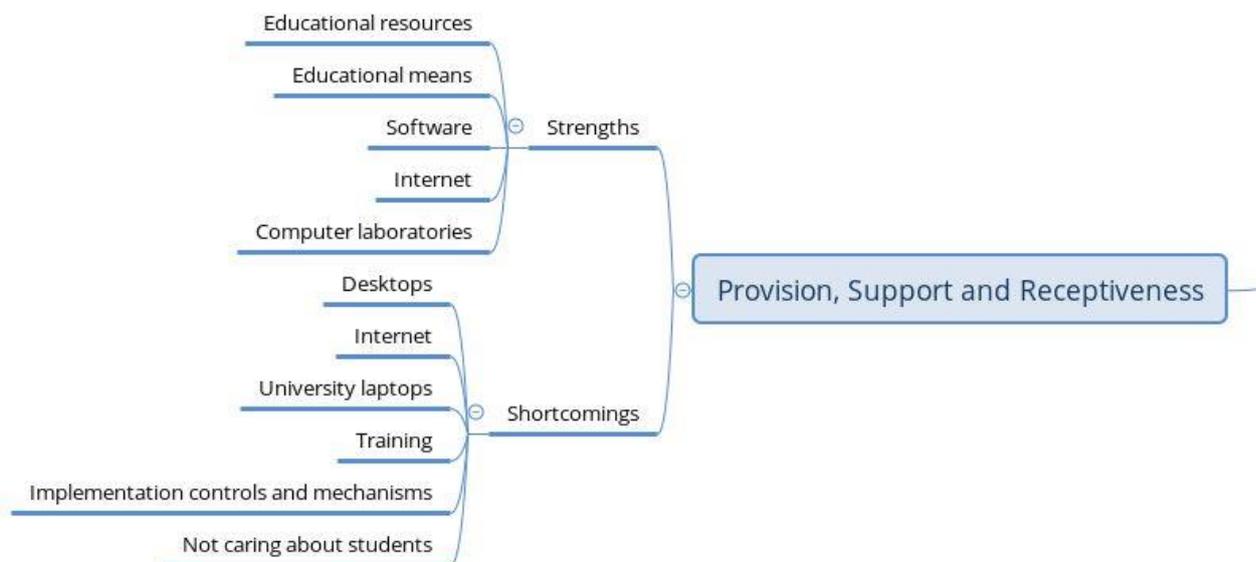


Figure 13: Mind map of themes on CL challenges - part B



**Figure 14: Mind map of themes on CL support**

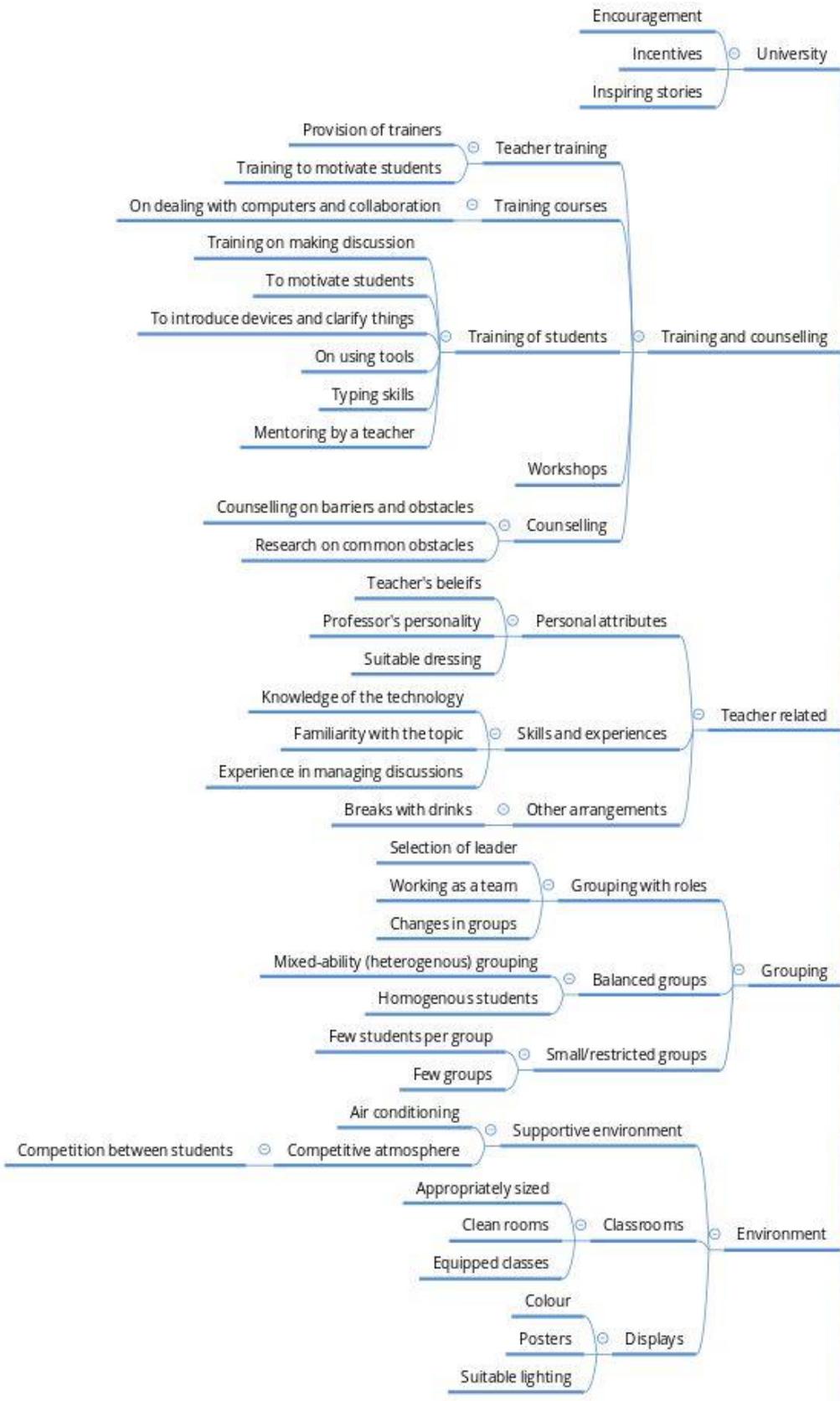


Figure 15: Mind map of themes on CL facilitators - part A

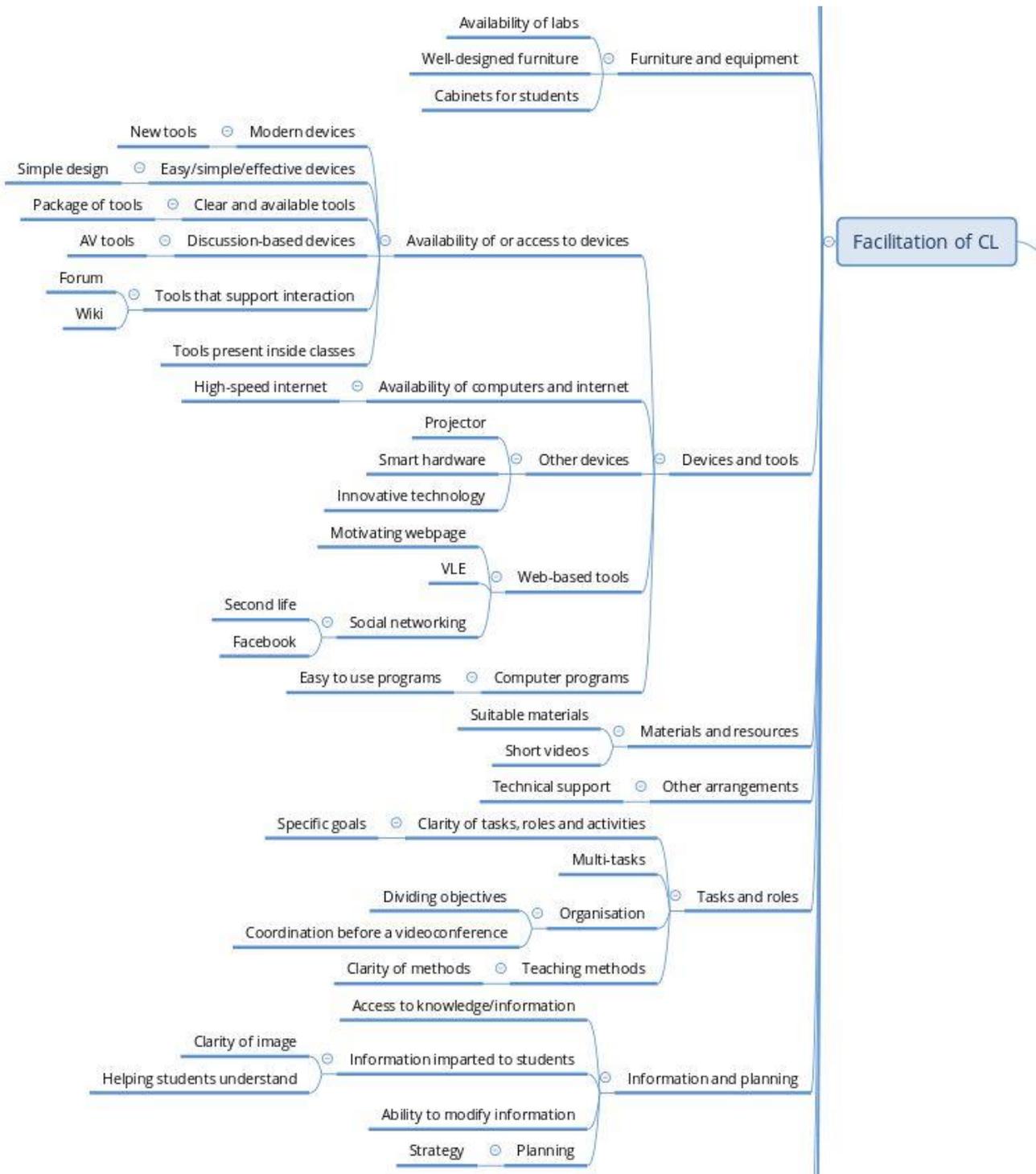
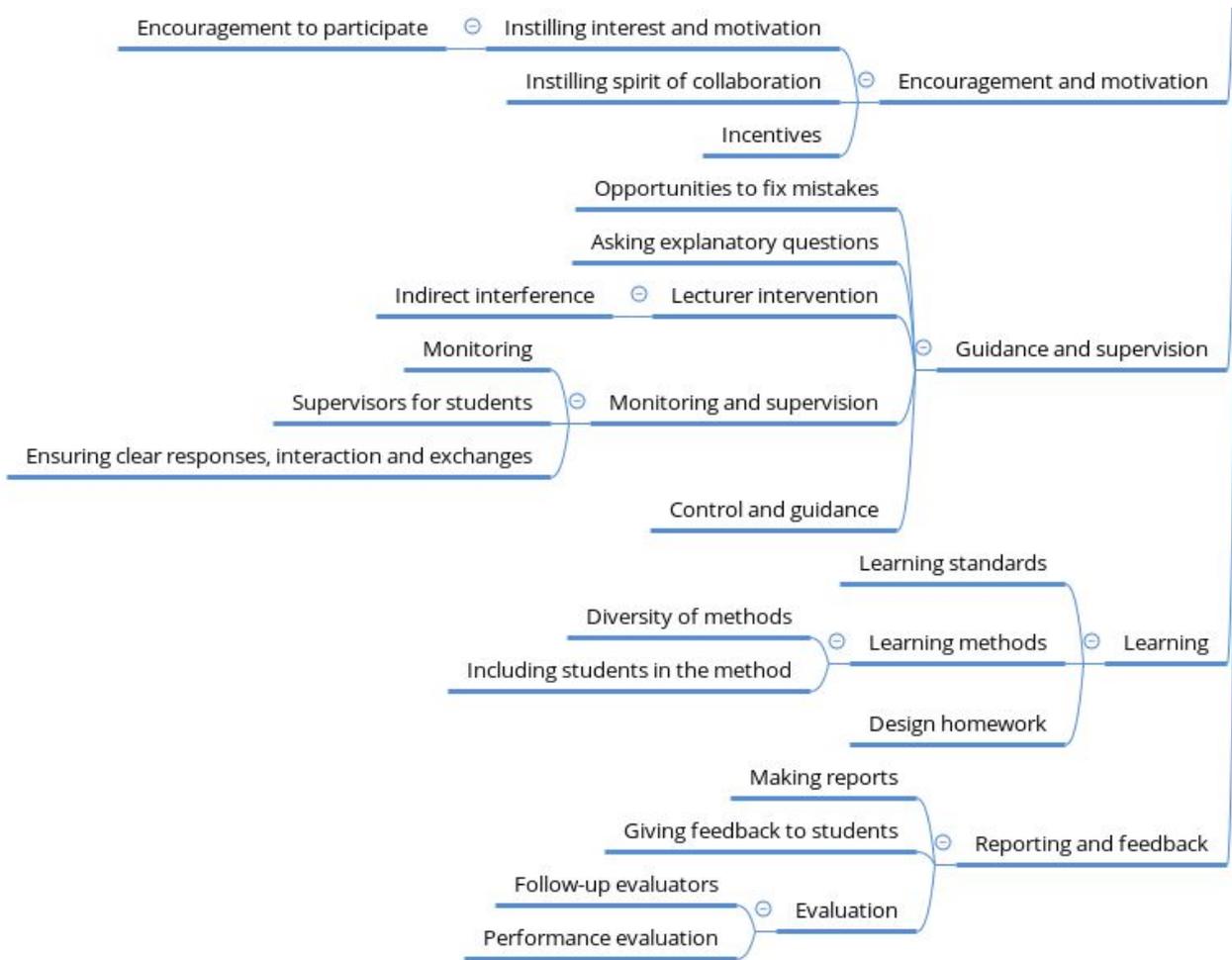
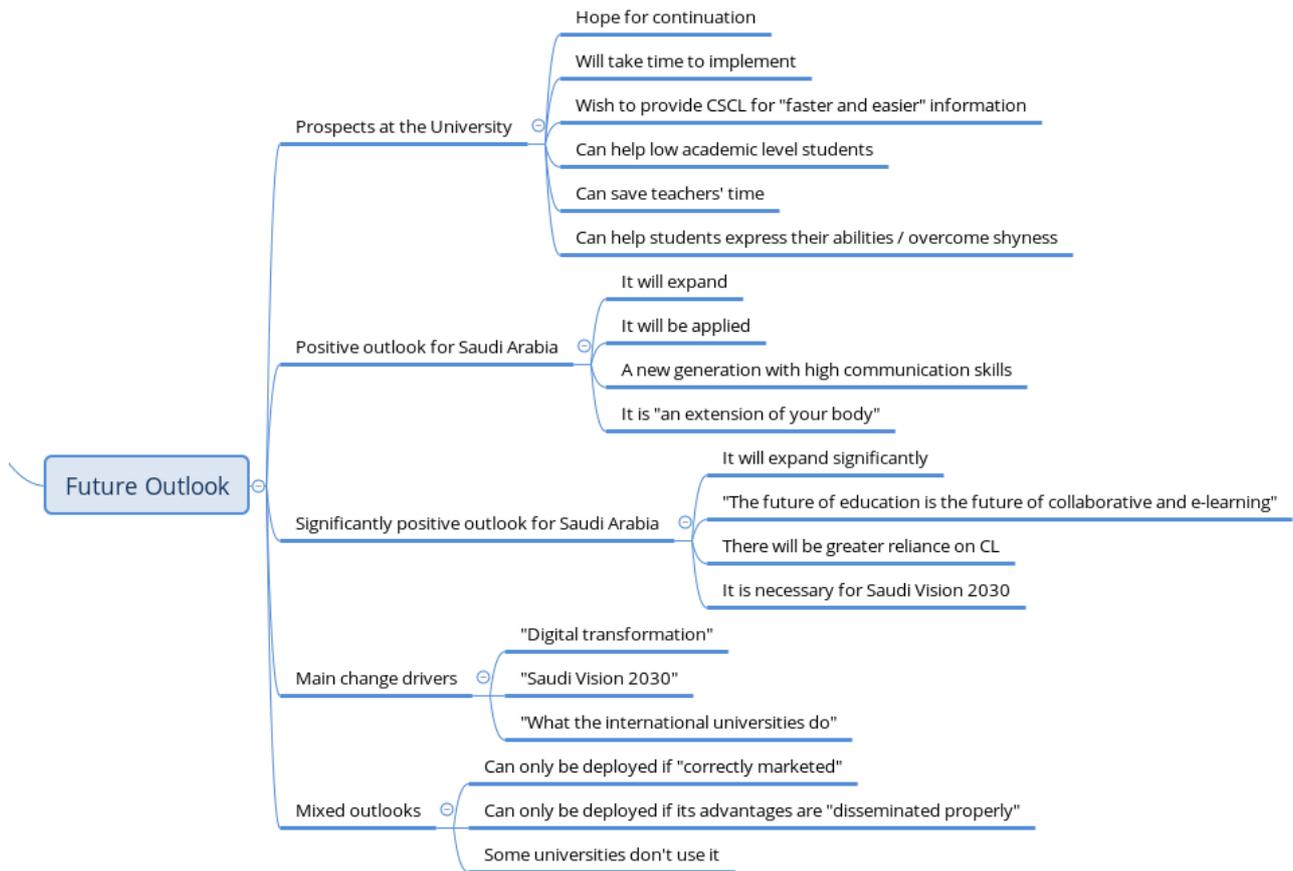


Figure 16: Mind map of themes on CL facilitators - part B



**Figure 17: Mind map of themes on CL facilitators - part C**



**Figure 18: Mind map of themes on the future outlook for CL in Saudi Arabia**

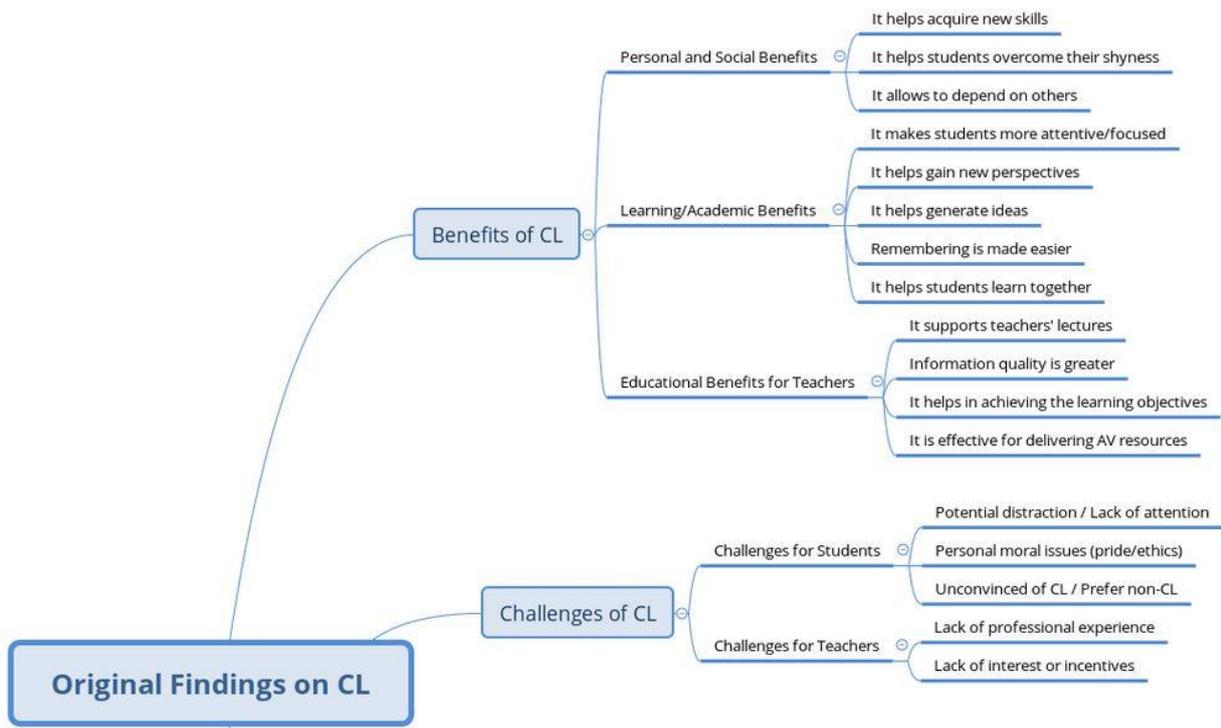


Figure 19: Key original findings on benefits and challenges of CL

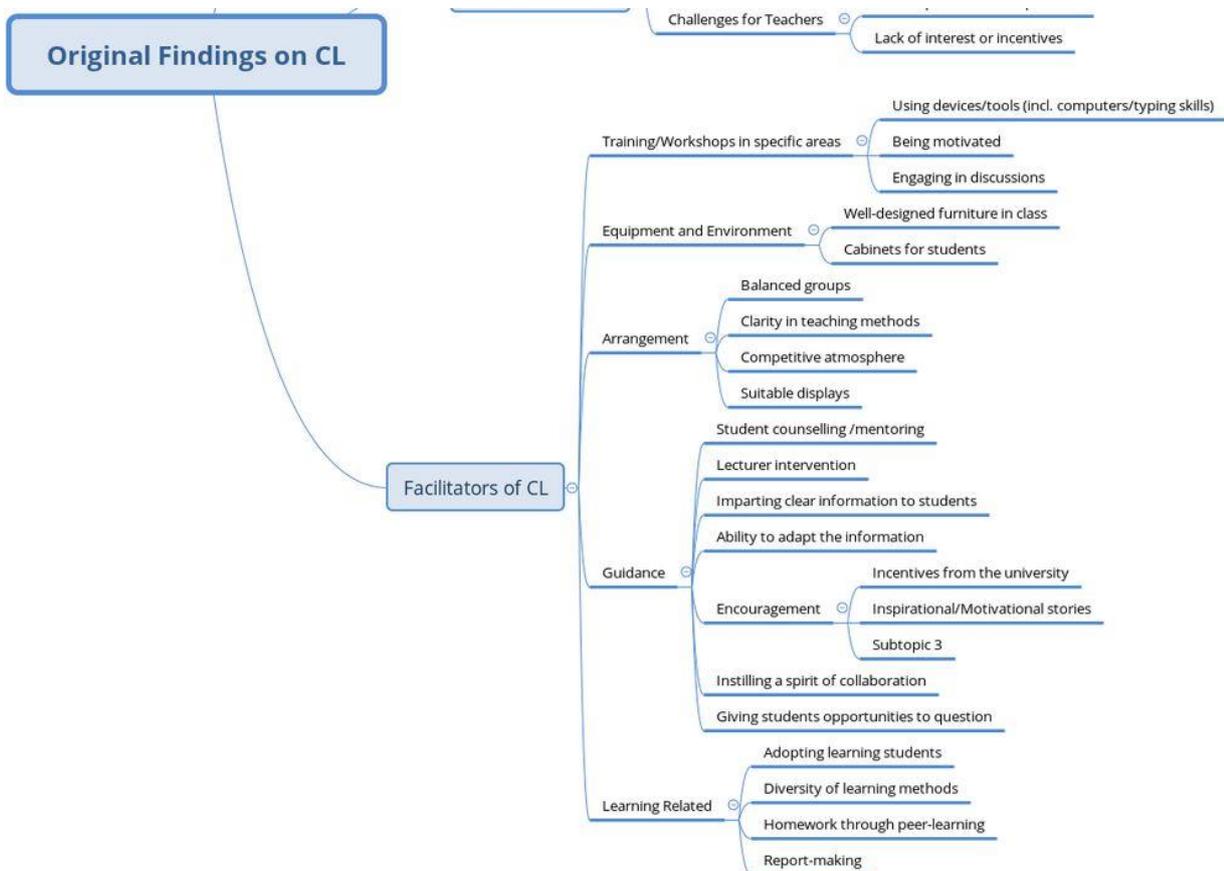


Figure 20: Key original findings on facilitators of CL