THE UNIVERSITY OF HULL

A COMPARATIVE AND EMPIRICAL EVALUATION OF THE CONTRIBUTION OF INFORMATION & COMMUNICATION TECHNOLOGY TO TOURISM MANAGEMENT EDUCATION

being a Thesis submitted for the Degree of

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by

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Abstract

This thesis explores the contribution of Information & Communication Technology (ICT) to tourism management education from a comparative and an empirical perspective. An overview of the context in which this research was carried out is provided and thereon, the veracity of tourism as a discipline in its own right is established. Using the programme in tourism business management offered at the Institute for Tourism Studies (IFT), Macao, as a case in point, an analysis of the tourism management curriculum is performed, which leads to the inference that a holistic tourism education is better equipped to integrate new management paradigms induced by the information age. An expedient mechanism for the comparison of curricula of programmes that do not fall under the purview of common regulatory guidelines is propounded, based on which the common context within which IFT operates in the Asia Pacific region is demonstrated, thereby allowing for a more robust applicability of the inferences arrived at in this thesis. The indispensability of ICT as a tool in the development of analytical and actuarial competencies from the perspective of tourism business management is demonstrated. Towards this end, career critical ICT skills are identified, the veracity of which is put to test by soliciting and comparing the perceptions of the tourism industry stakeholders. This exercise in comparison also brings into focus the gaps and discontinuities in the development of ICT enhanced managerial skills. From the standpoint of the development of analytical competencies, an empirical investigation to gauge the effects of integrating the usage of a spreadsheet application by virtue of computer assisted instruction (CAI) into the syllabus of a quantitative subject on the students' academic achievement is carried out, the outcome of which demonstrates the constructive contribution of the given ICT application in enhancing the students' level of

comprehension in that subject. On the basis of the inferences arrived at in this investigation, recommendations for effectively harnessing the prowess of ICT in developing conceptual and analytical competencies *sine qua non* for managers in the tourism industry are made and scope for further research is identified.

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ABBREVIATIONS

APETIT	Network of Asia-Pacific Training Institutes in Tourism
B2B	Business to business
B2C	Business to consumer
BPR	Business process reengineering
CAI	Computer assisted instruction
CBL	Computer based learning
CBS	Computer based solutions
CBT	Computer based testing
CRM	Customer relationship management
CRS	Computer reservation system
ERP	Enterprise resource planning
GDS	Global distribution system
GPA	Grade point average
GSA	General sales agent
ICT	Information & Communication Technology
IFT	Institute for Tourism Studies
ME-CATS	Macau-Europe Centre for Advanced Tourism Studies
MICE	Meetings Incentives Conferences & Exhibitions
PACES	Professional & Continuing Education School
PMS	Property Management System
POS	Point of sales
RMS	Restaurant management system
TCM	Tourism College of Macau
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

PROLOGUE TO THE THESIS

"When we walk to the edge of all light we have,
and take a step into the darkness of the unknown,
we must believe one of two things will happen,
there will be something solid for us to stand on
or we will be taught to fly."
- Patrick Overton

Author's Perspective

The author has been a lecturer in Quantitative Methods with the Institute For Tourism Studies (IFT), Macao, since 1998. He has been teaching business mathematics, statistics and quantitative methods in management and has been actively involved in integration and application of information and communication technology (ICT) in the curriculum with special emphasis on modelling techniques in management science using spreadsheet applications. Towards this end, he has organised summer schools, workshops and seminars as well as presented and published papers themed on the emerging trends in ICT and its impact on tourism management.

Aim

The principal aim of this thesis is to explore the role of ICT from a pedagogic perspective in augmenting analytical competencies of students majoring in tourism business

management so as to equip them with managerial skills that are *sine qua non* in meeting the requirements of a fast evolving tourism sector beset with challenges posed by an increasingly globalised and interconnected marketplace.

Objectives

The following objectives have been set forth so as to meet the aim of this research as defined in the preceding section:

- Identify discontinuities and gaps between the tourism sector demand and education supply vis-à-vis ICT enabled management competencies from the perspective of the stakeholders (i.e. students, academic faculty and industry practitioners).

- Assess the impact of ICT as an instructional tool on the students' level of comprehension of concepts in analytically oriented subjects in management science.

- Establish wider applicability for the findings of this study and thereby enhance its relevance.

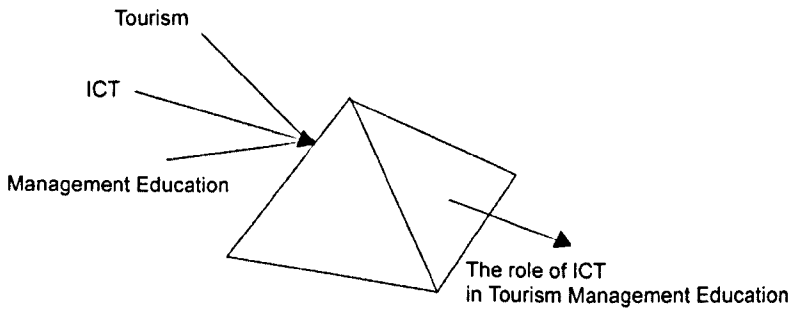
Scope

The primary data collection and analyses of this study were carried out in the context of Macao. IFT served as a 'laboratory' for the empirical aspects of this research whilst the local tourism industry with its attendant stakeholders formed the principal sources of primary data. The IFT management was kept posted of this research programme, its procedures and implications. The research is focussed on undergraduate students majoring in tourism and hotel management courses reading for a four-year degree in tourism business management. Provisions for achieving wider applicability and relevance in the regional context for the outcome of this study have been made by virtue of identifying academic institutions bearing a profile similar to that of IFT.

Structure & Methodology

The essence of this thesis is derived from the confluence of three seemingly disjoint disciplines, namely tourism, ICT and management education. Considered independently, each of these disciplines has a rich body of knowledge that has evolved over time by virtue of the contribution made to specific areas of human activity, endeavour and achievement. The extensive range of literature available in form of journals, books and electronic resources on the themes of tourism, ICT and management education attest to their significance. The principal challenge in achieving the stated aim and objectives of this thesis was the development of a common platform for the convergence of these three

disciplines. This challenge was 'tackled' by researching each of the three independently, focussing on the contextual framework and thereafter, deriving synergies to evolve an interdisciplinary platform on the role of ICT in developing analytical competencies in tourism management education. The figurative sketch of the approach adopted wherein the amorphous convergence of the three disciplines is brought into focus, forming a crystallised body of knowledge, is presented hereunder.



Taking recourse to such an approach has had its ramifications on the overall structure of the thesis. In a marked departure from convention, no provision has been made for an independent chapter as a literature review on account of there being little or no literature available in the combined inter-disciplinary area of tourism, ICT and management education. Instead, literature reviewed on specific aspects of the study has been subsumed into the overall fabric of the thesis at relevant junctures. In retrospect, in contrast to restricting the literature review as an isolated chapter, such an approach wherein ideas and conjectures from published literature are drawn upon to either refute or substantiate the arguments being propounded in the main body of the thesis, contributes towards ensuring a more concise and holistic perspective of the subject matter under scrutiny. On a different note, the constraint pertaining to the lack of adequate access to printed

literature in Macao was significantly diluted, thanks to on-line repositories and databases of journals in electronic format with full-text retrieval options available via the Internet as well as the extensive collection of documentation and literature available at the Hong Kong Polytechnic University's library to which the author was granted good-will access.

The following research methods have been taken recourse to in the development of this thesis:

- Quasi-experimental design
- Comparative analysis of documentary evidence
- Survey
- Semi-structured interviews

The quasi-experimental design which involved a longitudinal study was applied to assess the impact of ICT as an instructional tool on the students' level of comprehension of concepts in analytically oriented subjects in management science. A comparative analysis of the curricula of academic institutions belonging to a regional network was carried out so as to define a population of entities having a profile similar to that of IFT which would allow for extrapolating the applicability of this study's findings and thereby fortify its relevance. The survey instrument was employed to gauge the perceptions of students on a host of attributes related to the relevance and utility of ICT in their education and careers whilst the opinions of the academic faculty and industry practitioners on this score were gauged by virtue of semi-structured interviews.

The thesis comprises a total of seven chapters followed by a list of references and an appendix containing relevant supporting material. Following is a repertoire of questions demarcated with respect to the chapters in which the answers have been provided, that lead towards meeting the objectives of this thesis.

Chapter 1

- What is the contextual backdrop in which this study has been conducted?

Chapter 2

- Is tourism a discipline in its own right?
- How can IFT's curriculum be positioned in this context?
- From the perspective of dominance of generic management subjects, what are the differences in the curricular structure of hotel and tourism streams?

Chapter 3

- How does IFT's curriculum compare with that of its regional peers?
- Is there a thread of commonality that binds them that would allow for defining a regional population of hospitality and tourism management students with common attributes?

Chapter 4

- In what way has ICT contributed to the tourism sector?

- What has been the role of ICT syllabi in preparing students in tourism management programmes to meet the tourism sector's requirements and challenges in terms of management competencies?
- What are the career critical ICT skills in this sector?

Chapter 5

- As stakeholders in the tourism industry, how do students, academic faculty and industry practitioners perceive the significance and role of ICT from their respective standpoints?
- To what extent are these perceptions mutually consistent?
- Are there any discontinuities and gaps in what is taught and what ought to be taught in the ICT syllabus?

Chapter 6

- Are the differences in curricular structure of the hotel and tourism streams an issue in so far as the students' academic achievements are concerned?
- Does the application of computer assisted instruction (CAI) make any difference to the students' level of comprehension of concepts in analytically oriented subjects in management science which are essential to tourism business management?
- Are the findings in conformity with theoretical considerations?

Chapter 7

- What recommendations can be made on the basis of inferences arrived at in this study?
- What is the original contribution made by this study to the existing body of knowledge?
- What is the scope for further research?

Semantics

A host of terms have been used interchangeably in the text of the thesis, given the blurred line of demarcation in their concepts and definitions. The usage of a given term has to be interpreted in the appropriate context. For instance, unless otherwise specified, reference to the tourism industry includes hospitality as well. Also, the terms 'sector' and 'industry' have been used interchangeably. In light of the multitude of definitions attributable to CAI, the context in which this term is applied in this thesis has been clearly spelt out. Also, CAI, when used in a generic sense at certain junctures in the thesis, subsumes CBT. Generic management subjects are oftentimes referred to as non-core subjects, to distinguish them from their core counterparts focussed purely on hotel or tourism. The adjectives 'analytical' and 'conceptual' refer to non-routine procedures, more specifically directed at computational and actuarial skills.

After the handover of Macao to Chinese sovereignty, the official English spelling was decreed as being 'Macao', instead of the Portuguese variant, 'Macau'. However, the official nomenclature established before the handover continues to carry the Portuguese variant. In the text of the thesis, wherever official names of organisations have been referred to, the original spelling has been retained.

CHAPTER 1 PREAMBLE

1.1 Chapter Introduction

This Chapter provides the contextual backdrop in which the research is conducted. The role of the tourism and hospitality industry as an engine for economic growth in the Asia Pacific region is discussed with emphasis on human resources and training requirements as are also efforts at fostering regional cooperation in this area. An introduction to Macao, the locale for this research is provided with specific focus on its principal economic activities and its system of education. The chapter concludes with a preface to the Institute for Tourism Studies (IFT) which served as a 'laboratory' for the empirical aspects of this research.

1.2 The Economics of Tourism

Tourism has emerged as a major contributor to the global GDP, with total revenues of about USD five hundred billion in 2001 (WTO, 2002). The World Tourism and Travel Council forecasts (WTTC and American Express, 1995) indicate that the contribution of tourism related activities to the global economy would reach circa USD seven trillion by 2005 and jobs in this sector would come to represent approximately 11% of the total world employment. To date, the tourism and hospitality industry has been drawing on

its human resource requirements largely from other economic sectors on an *ad hoc* basis. Training has been fragmented and occupational with the aim of keeping efficiency high and operating costs low. This satisfied the market requirement as long as the mass tourism model held sway. However, globalisation powered by the ICT revolution, has brought about a growing complexity of demand segmentation in the leisure and travel sectors as it provides the information backbone that facilitates tourism (Sheldon, 1997). The tourism industry is in the throes of major structural changes after over four decades of sustained quantitative growth, thereby having to take recourse to a new entrepreneurial paradigm (Poon, 1993), (Theobald, 1994). This *New Age of Tourism* (Fayos-Sola, 1993) mandates that the human resources be recognised as an input rather than a mere cost, thereby being able to generate their own added-value. Thus, tourism has come to be recognised as a sector in its own right and this in turn has spurred demand for education and training of human resources for the tourism and hospitality industry. Studies in tourism and hospitality have evolved from isolated subjects offered as electives as part of other majors or in some cases vocational qualifications, to a discipline in its own right. Alongside autonomous institutes dedicated to tourism studies, universities have been setting up departments that offer degree level programmes in tourism and/or hospitality management.

The East Asia and Pacific region (EAP) is expected to show a sustained growth of 6.6% until 2020 which is above the global average of 4.3% per annum (WTO, 1999). For instance, tourism represents the principal economic activity in Hong Kong (Law and Au, 1997). In fact, two North East Asian destinations, China and Hong Kong, appear in the list of the world's top ten markets (WTO, 2000). By the year 2010, it is estimated that the industry will generate employment for circa 127.8 million people in the Asia Pacific region with a turnover of USD 4.4 trillion (WTTC, 2000). Whilst there is some

debate about the exact figures (Pine, 2001), there are no grounds to dispute the fact that this sector is witnessing a phenomenal growth in the region, thereby leading to a situation where the needs of the tourism employers will grow at a faster rate than the quantity and in particular, the quality of talent available (Muqbil, 1994). This has underscored the relevance and importance of educational and training facilities required to develop human resources to satisfy the ever-growing and ever-changing needs of the tourism sector fuelled and sustained by advances in information and communication technologies (ICT) as well as the dynamics of the international tourism market. Educational and training opportunities have a direct bearing on the quality of human resources which is essential in ensuring effective operation and efficient administration in a service oriented sector such as tourism. Vocational training can boost operational effectiveness of a workforce; however, development of managerial competence necessary for efficient administration and strategic planning poses a qualitatively different challenge. Tourism being a relatively nascent discipline, there is a perceptible lack of managerial skills at all levels of the sector which could prove an impediment to its growth. There is a risk that in order to satisfy this demand of qualified tourism professionals, *ad hoc* specialisation courses in tourism without any coherent long term objective would be taken resort to (Ritchie, 1990). Hence, it is necessary to evolve a policy that mandates a cooperative approach based on interchange and sharing of experiences, resources and ideas among concerned entities.

1.3 Regional Cooperation in Tourism Training: The APETIT

With the aim of fostering cooperation in the development of human resource capital in the tourism sector in the Asia-Pacific region, the Network of Asia-Pacific Training

Institutes in Tourism (APETIT) was established under the aegis of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in 1997. This approach is modelled on other global and regional networks such as the World Tourism Organisation Network of Tourism Education Centres and the European Tourism Education Network. The current membership of APETIT includes tertiary and vocational educational establishments as well as national/regional tourism organisations spanning circa 30 ESCAP member countries in the Asia Pacific region (Appendix 1). APETIT professes to promote collaboration in education, training and research so as to ensure optimal utilisation of resources at the disposal of member entities in developing qualified managerial talent to satisfy the needs of the tourism industry. This is a challenge in itself in the absence of a universally acceptable definition of tourism which can prove an obstacle in the identification and solution of training and education problems in this sector (Smith, 1988). In its evolving phase, *'it is more a developing science in which most well established social sciences converge i.e. a multi-disciplinary area'* (Ritchie, 1992; 260). The World Tourism Organisation's (WTO) multidisciplinary model related to the study and research of tourism (WTO, 1995) draws on elements in diverse disciplines comprising anthropology, business management, ecology, economics, education, geography, law, psychology and statistics as components that define tourism as a subject in the conventional sense of the term. A more updated model will have to include Information and Communication Technology (ICT) which is patently missing in the WTO model as it has revolutionised all aspects of tourism activity in recent years. Thus, the multi-disciplinary nature of tourism as an economic activity places a heavy demand on the nature of management skills required to be able to serve effectively in this sector. Over and above the specialised operational proficiency and a sound academic background, management skills would mandate a profound understanding of the influence of current affairs (political, socio-cultural,

economic) on marketing strategies. Besides, in this era of globalisation, practitioners in this sector need to be multi-lingual and adapt to a multi-cultural work environment. Also, modern day managers have to be ICT literate, irrespective of the sector they work in and tourism is no exception. Studies have indicated that management level personnel in the hospitality and tourism industry, irrespective of their geographical locale, need to use ICT in one form or another in discharge of their duties (Van Hoof et. al, 1997). In fact, given the rapid pace of advances in ICT, this is an area the developments in which require constant updating in order to remain competitive.

These demands coupled with drawbacks the tourism industry faces, more prominent among them being relatively poor compensation packages in comparison to other sectors, longer working hours and paucity of experienced trainers thereby leading to low motivation and self-esteem, place an onerous challenge on the educators to deliver. Cooperation among APETIT members would facilitate overcoming some if not all of these challenges partially or in totality, thereby generating culturally diverse and geographically spread out sources of talent that retain a local flavour whilst simultaneously exhibiting core skills and competencies consistent with the requirements of the tourism industry. In defining its role as a catalyst for networking amongst member institutions (UNESCAP, 2002), APETIT has identified five activity groups. These are:

- Information management (Website and data base on APETIT members)
- Communications links (Electronic newsletter and publicity)
- Training and consultancy (Infrastructure sharing and faculty exchange)
- Experience sharing (Workshops, seminars, study tours etc.)
- Research and development (Technology transfer, joint research, career planning)

For each of these activity groups, a member institution serves as the focal point for coordination. For instance, the Institute For Tourism Studies (IFT), Macao, acts as the focal point for training and consultancy services. Besides, APETIT also facilitates bilateral and multilateral cooperation between its members. As an example, IFT has transferred instructional material to the Institute of Tourism Management, Mongolia and has conducted professional development courses for members of APETIT under the aegis of the Macao Europe Centre for Advanced Tourism Studies (ME-CATS) which is hosted in IFT with funding from the European Union.

Having discussed the prospects of the tourism industry, education and training within the context of the human resource requirements in the Asia Pacific region and the efforts at fostering regional cooperation among tourism and hospitality training institutes in this section, the following section provides an overview of the environment in which this study has been undertaken.

1.4 Macao: The Locale

The research has been conducted at The Institute For Tourism Studies, Macao. Macao is geographically located about sixty kilometres from Hong Kong on the south-east coast of China, harbouring the western flank of the Pearl river delta. Having an area of approximately 24 square kilometres and a population of just under half-a-million which is predominantly ethnic Chinese, Macao had been a Portuguese protectorate for over four- hundred years until it was handed over to China in December 1999. Under the "One Country Two Systems" arrangement, Macao is now a Special Administrative

Region of the People's Republic of China. Despite a relatively modest population, Macao boasts of one of the highest population densities in the world which in 2001 stood at 18000 people per square kilometre. Over the last two decades, Macao has witnessed a significant demographic growth, by virtue of an influx of immigrants from mainland China, increasing at an annual rate of about four percent. As of 2000, only 45% of the local population were born in Macao. Being a special administrative region, Macao has a separate immigration zone and its own currency, the Macao Pataca (MOP) which is pegged to the Hong Kong dollar. A separate immigration zone, a relatively small population and a modest area notwithstanding, Macao has an impressive flow of people in and out of the territory, which averages 25 million per year. In economic terms, with the average per capita income of over US $ 14,000, Macao's Gross Domestic Product (GDP) in 1999 stood at US $ 6228 million growing from a modest US $ 1287 million in 1982 (MGTO, 2001). In the recent past, the textile manufacturing sector has been gradually replaced by the service (in particular, tourism) sector as the principal pillar of the Macao economy. Even as manufacturing units have been relocating across the border to Mainland China on account of lower operational costs, the tourism sector has emerged as the main income generator, employing about 30% of Macao's working population and generating approximately 40% of the revenue. The spurt in the tourism sector is chiefly attributable to Macao's gaming industry, the roots of which date back to the early 1960s when the then Portuguese administration granted casino monopoly to Sociedade de Tourismo e Diversoes de Macau (STDM), in lieu of which the gambling monopoly has been paying an annual gambling tax which is reviewed periodically and currently stands at 31.8% of its gross gambling revenues, representing 40% of the total income into the Government coffers. The monopoly arrangement has drawn to a close in 2002, and in its wake, has introduced competition by virtue of public bidding for licences which, along with STDM in its new avatar as

Sociedade do Jogos de Macau or SJM, have been awarded to two Las Vegas gaming conglomerates Galaxy Casinos and Wynn Resorts. However, this move is not expected to affect revenues. Macao's top three sources of in-bound traffic are Hong Kong, China and Taiwan in that respective order, cumulatively accounting for over 95% of the total tourist arrivals as of 2002 data. The gambling industry receives its patronage chiefly from among residents of Hong Kong where gaming (except in relation to equestrian sports) is prohibited by law. The high number of tourist arrivals from Hong Kong as shown in Appendix 2, attests to this fact. The absence of direct air links between China and Taiwan has positioned Macao as a transit hub for air travellers flying between these destinations. Since Macao's handover to Chinese sovereignty, there has been an upsurge in visitor traffic from mainland China, fuelled by liberalisation of immigration procedures and policies. Gaming, however, remains the principal visitor attraction in Macao.

The negative social fallout of playing host to the gaming industry has been reflected in the operations of the organised crime syndicates, thereby tarnishing the image of Macao as that of a hub for anti-social activities. Consequently, over-reliance on receipts from the gaming industry has been a cause of concern to the Government and there has been a conscious and steady shift in emphasis on part of the policy makers to promote Macao as a destination for heritage tourism and meetings, incentive travel, conventions and exhibitions (MICE) sector. Macao has inherited a rich and diverse cultural heritage and patrimony from over four centuries of Portuguese presence in what is purported to be the first (and *de facto* the last) Occidental foothold in China. This legacy sets Macao apart from Hong Kong and the rest of China, giving it a unique identity which reflects in its life-style, architecture and cuisine, thereby making the proposition of selling Macao as a destination for heritage tourism feasible and sustainable. Towards this end,

Macao has made a representation to the UNESCO to accord it the status of Heritage City, which as of February 2003 was *sub judice*. In parallel, there has been a significant investment in the infrastructure sector with the aim of attracting MICE events. Comparative price advantage vis-à-vis established MICE destinations in the region such as Hong Kong and Singapore provides Macao with an opportunity to be a serious player in this business. The Macao Tower Convention and Entertainment Centre, purported to be the tenth tallest structure in the world is the latest in a series of amenities to have emerged on the MICE market horizon.

Thus, the regional and global economic crises in recent years notwithstanding, inbound tourism trends from within the greater China region (inclusive of China, Taiwan and Hong Kong) have demonstrated a sustainable character. The recent emphasis on promoting Macao as a destination for heritage tourism and MICE provides an opportunity to attract tourism business from outside the greater China region, markets of which, as is evident from the data in Appendix 2, have been hitherto under-explored. It is evident from this discussion that tourism, whether from within the greater China region or without, in its different manifestations, is set to play an increasingly important role in the development of Macao's economy in the future. In perspective, an overview of Macao's tourism sector ensues.

1.5 Macao's Tourism Sector

The contribution of the tourism and hospitality sector to Macao's economy was underscored in Section 1.4. Attempting to accurately define the composition of the tourism sector can be a challenge as there is no standardised definition in literature of

what comprises tourism related businesses. In general terms, catering and hospitality establishments, travel agencies and transportation companies form what may broadly be described as the tourism sector. Given the existing scale of economic dimensions in the case of Macao, there are certain unique nuances that characterise this sector. In the case of hotels, a selection of twenty-five choices ranging from five-star chain hotels to budget accommodation is available. The branded hotel chains are franchisee operations whilst the others are privately owned. A significant proportion of the investment comes from mainland China, Hong Kong and Taiwan. The larger hotel operators have casinos on their properties since gaming forms the principal tourism attraction in Macao as of now.

The staffing policies among the hotels vary considerably and are strongly influenced by the availability of cheap labour from Mainland China. In case of the unbranded hotel operators, most of the operational staff are recruited from mainland China on fixed term working visas against the import labour quota sanctioned by the Government which is adjusted periodically on the basis of the local unemployment figures. As per the one country-two systems arrangement, mainland Chinese nationals working in Macao are considered as imported labour. In certain cases, these include staff up to the level of junior managers. In the case of branded hotels, the top management is sourced from their respective corporate offices whilst the junior staff comprises a mix of locals and imported labour, predominantly from the Philippines and mainland China. Consistent with the existing dynamics of the inbound tourism market, minimising operational costs takes precedence over ensuring quality of service though this tends to be less pronounced in the case of branded hotels. To this effect, there are wide variations in terms of the skills and competencies requirements, remuneration scales, career prospects and work conditions.

The magnitude of the variations on the scale of operations and turnover in Macao has deprived the industry of any semblance of uniformity or structure. However, with the deregulation of the gaming industry as discussed in Section 1.4, the market dynamics are set to change in the near future as two gaming giants Wynn Resorts and Galaxy Casinos who have bid successfully for entering the Macao market have committed to the development of the high-end casino market with plans for mega infrastructure projects. These developments will induce a shift in focus of the industry, making it more sensitive to ensuring quality of service. In turn, a realignment of priorities in this direction will trigger demand for qualified professionals locally along with promising career prospects, which at this juncture in time is at best modest.

In the case of travel and tourism entities such as travel agencies and tour operators, the situation is not vastly different albeit for other reasons. As of 2002, there were a hundred and ten registered travel businesses. An overwhelming majority are small family run enterprises. Of these, less than half are actually in business, the rest continuing their accreditation in dormancy. In the case of major operators, most are subsidiaries of Hong Kong based companies who restrict their local recruitment to operational staff. The impending developments in the gaming industry are expected to provide a fillip to travel and tour businesses, thereby broadening their base of operations. This will consequently generate demand for managerial competencies, as in the case of hotels and will streamline the rather patchy and unorganised nature of this sector.

In summary, it can be stated that the presently nebulous structure of this industry is bound to evolve into a more structured configuration in the foreseeable future. That

said, the sector has made attempts at having a more unified approach by virtue of forming associations such as the Macau Hotels Association, Macau Travel Agency Association, Association of Macau Tourist Agents, Travel Industry Council of Macau, Macau Hotel Trade Association and Association of Retailers and Tourism Services to better represent their interests to the Government. This however has had minimal impact on streamlining human resource policies on account of the hitherto discussed variations. The very existence of such a large number of industry associations with overlapping interests and memberships points towards a fragmented structure and absence of cohesiveness, which eventually will have to yield to greater degree of coordination and perestroika in the face of the impending changes brought about by the deregulation of the gaming sector.

In order to optimise on the economic advantages accruing from the forthcoming developments in Macao's tourism and hospitality sector, it is *sine qua non* to address the issue of human resources requirements of this industry. With the aim of placing this issue in its proper perspective, the following discussion provides an overview of the contemporary 'education scene' in Macao.

1.6 Macao's Education System

The education sector in Macao has had a fragmented structure on account of a *laissez-faire* approach of the authorities over the years. For instance, with schools following different curricula, there is no uniform school leaving examination. Besides, Macao schools do not have a common medium of instruction. Whilst in majority of schools Chinese is the language of instruction, some adopt English and yet others, Portuguese.

This diversity of curricula and media of study poses a challenge to streamline entry into tertiary education which in itself is a relatively recent phenomenon in Macao. Macao's first tertiary institution was established as recently as 1981 in the guise of University of East Asia, re-christened as University of Macau in 1991. Also in that year, a group of University departments split off to form the Macau Polytechnic Institute. 1995 saw the establishment of the Institute of Tourism Education or Instituto do Formação Turistica in Portuguese abbreviated as IFT and subsequently re-named as Institute for Tourism Studies in 2000, retaining the Portuguese abbreviation IFT. By 2002, there were a total of eleven tertiary educational entities in Macao, both, privately and publicly funded, offering Diplomas, Bachelor's, Master's and Doctoral degrees in a range of disciplines. These entities are listed in Table 1.1.

Table 1.1 Institutions of higher learning in Macao

Private
Asia International Open University (AIOU)
Inter-University Institute of Macau (IIUM)
Institute of European Studies of Macau (IEEM)
Kiang Wu Nursing College of Macau (KWNCM)
Macau Institute of Management (MIM)
Macau University of Science and Technology (MUST)
Public
University of Macau (UM)
Macau Polytechnic Institute (MPI)
Institute For Tourism Studies (IFT)
Macau Security Force Superior School (ESFSM)
United Nations University, International Institute for Software Technology (UNU/IIST)

In the absence of common school leaving exams, each institution has its own unique system of admitting students to its programmes. For instance, the University, Polytechnic and IFT conduct independent entrance tests and interviews, thereby placing school-leaving students under pressure by requiring them to prepare separately for each of the entrance tests having diverse syllabi. However, despite this anomaly, the authors

of a recent study commissioned by the Macao Government on the state of higher education in Macao (Bray et al, 2001) do not recommend a unified higher education entrance exam at this stage, citing major technical challenges in terms of implementation for a small society like Macao.

1.7 IFT: In Perspective

In the backdrop of the context described in the preceding section, IFT has been one of the major players in the education sector of Macao. Established in 1995, the Institute, which is publicly funded focuses exclusively on tourism and hospitality training and education. In 1997, IFT was awarded the Pacific Asia Travel Association's (PATA) Gold Award for Education and Training. That same year saw IFT become a founder member of the Network of Asia Pacific Education and Training Institutes in Tourism (APETIT) under the aegis of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). IFT has been nominated as "Training the Trainers Centre" to cater to the training needs of the APETIT members. In 1999, the European Commission funded the establishment of the Macao-Europe Centre for Advanced Tourism Studies (ME-CATS) in IFT with the objective of sharing, transferring and disseminating European experiences and know-how in tourism and hospitality. In 2000, IFT became the premier recipient of the World Tourism Organisation's (WTO) THEMIS-TEDQUAL certification in recognition of having attained global standards of quality in tourism education in accordance with the guidelines laid down by the WTO.

One of the principal objectives of IFT is to meet on a continual basis the human resource needs of the local tourism and hospitality industry (hereafter referred to as 'the

industry') by providing a talent-pool of industry professionals groomed to live up to the industry's expectations and requirements. To this end, IFT has a dichotomous structure in that it comprises the School of Professional and Continuing Education Programmes (PACES) and the Tourism College of Macao (TCM).

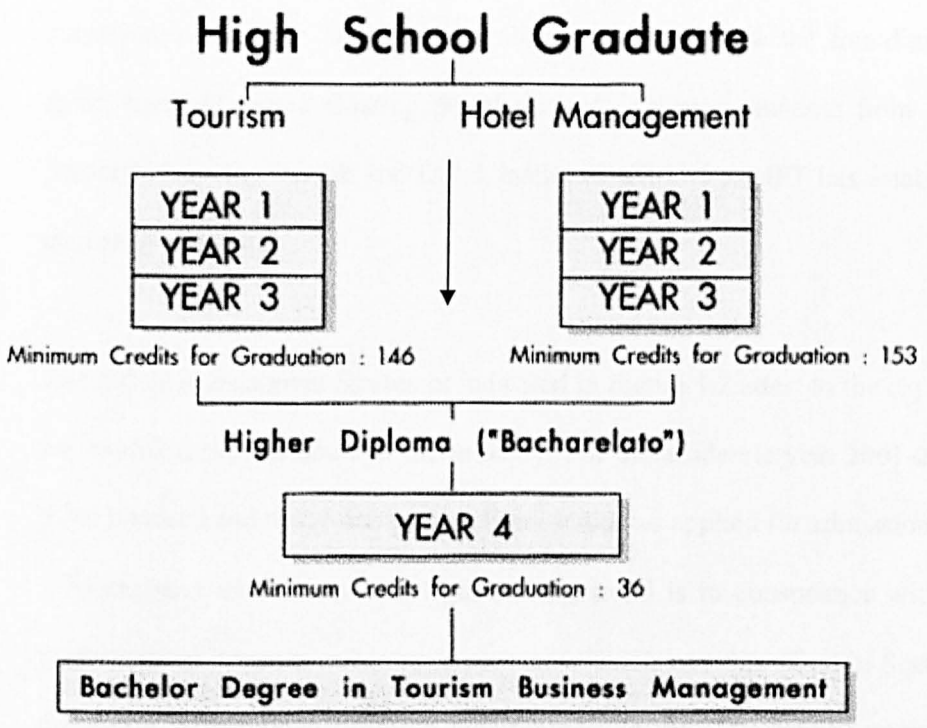
The programmes offered by PACES are targeted at those already working in the industry and wishing to upgrade their skills as well as at the local community. These programmes span five broad areas viz. travel, hospitality & catering, languages & communications, customer service development and management. PACES is also involved in projects aimed at creating and raising the awareness level of the society at large on the significance and relevance of tourism for the long-term development of Macao. A majority of the courses offered in these programmes are vocational in nature and are typically of a short duration, ranging from daylong courses to a maximum length of six months. In the calendar year 2001, PACES had a net rolling student enrolment of four thousand.

The TCM offers a four-year bachelor's degree programme in Tourism Business Management. This programme has two streams viz. Hotel Management and Tourism. Upon successful completion of three years of full-time study which enables them to accrue the required number of credits, students qualify for a diploma in either of the two streams, making them eligible to commence work in the industry while simultaneously providing them an option of continuing in the supplementary fourth year of study (evening classes) leading to the bachelor's degree. The study path is illustrated in Figure 1.1.

The medium of instruction is English and the criteria for admission are:

- Completion of higher secondary schooling
- Satisfactory results in the entrance exams in English and Mathematics
- Satisfactory performance in the admission interview

Figure1.1: Study Path at IFT's Tourism College of Macao



Source: IFT Prospectus 2000-2001

Until 2001, each intake of students comprised up to a maximum of 70 students more or less equally divided amongst the two streams. The number of seats per intake is predetermined by the Government in consultation with the industry in accordance with their projected requirement. This ceiling is supposed to avoid the problem of overproduction of qualified tourism graduates which would prejudice the ability of the students to be employed in the sector. Also, given the two-step nature of the study path (diploma and degree), a more liberal intake would engender the risk of both groups, the

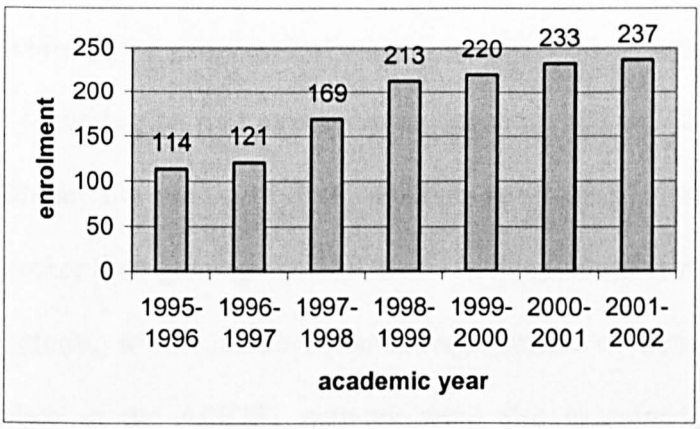
diploma holders and the degree holders, competing for the same jobs, thereby diluting the objective and scope of the programme. The Macao Government provides a subsidy for all the students enrolled in the degree programme. In terms of demographics, circa 12% of the TCM students come from overseas; these, *inter alios*, have included nationals of China (Mainland), Taiwan, Malaysia, Mongolia, Morocco, the Philippines, Portugal, Russia, South Africa, South Korea, Tonga and Venezuela. The net enrolment in the academic year 2001-2002 stood at 237 students. Figure 1.2 provides a chronological history of student enrolment in TCM since the founding of IFT. That apart, there is also a floating population of exchange students from South Korean, Swedish, Danish, Finnish and Dutch institutes with whom IFT has established student-exchange protocols.

The growing enrolment figures as indicated in Figure 1.2 attest to the expected demand for qualified professionals in the industry. For the academic year 2001-2002, a total of three hundred and thirty-one prospective candidates applied for admission which was an 11% increase over last year's figures. This trend is in consonance with the growing importance of tourism in Macao's economy which was discussed in Section 1.6 and is consistent with human resource requirements in the Asia Pacific region as a whole which is expected to grow at a faster rate than the quantity and in particular, the quality of talent available (Muqbil, 1994).

In spite of the steady growth in demand and student enrolment, in absolute terms, the existing numbers of the TCM student body are very modest. This has had direct repercussions on the size of the academic faculty that IFT can accommodate. The strength of the academic faculty since 1997 has varied between nine to thirteen with a varied mix of lecturers in core industry (operational) subjects, management disciplines

and the languages. A lecturer's typical workload consists of between twelve to fifteen contact hours per week over and above consultation hours wherein, depending on expertise and area of specialisation, s/he is required to teach between three to five subjects per semester.

Figure 1.2: Student Enrolment in IFT's TCM



Source: IFT Registry

Despite the spread, the numbers are grossly inadequate to cover the entire spectrum of the curriculum. This shortfall is overcome by recruiting practising professionals to teach in the subject areas of their expertise on a part-time basis during the course of the semester as also by inviting visiting professors from overseas institutions having a protocol of cooperation with IFT to deliver courses in a modular format. Being taught by practising professionals, students stand to benefit in terms of getting a first hand impression about the application of a given subject area to a real world environment. However, there is an element of trade off in terms of a lack of rigorous theoretical perspective as well as on-campus availability of the adjunct/visiting faculty for consultations. The ratio of full time academic faculty to their part-time or adjunct counterparts has hovered in the region of a third.

1.8 Chapter Summary

After exploring the impact of the industry on the Asia Pacific region's economy and the spur in demand for training this has induced thereby leading to the establishment of the APETIT network epitomising efforts at regional cooperation, the chapter has provided an overview of the geographical context in which this research has been carried out i.e. Macao, focussing on its tourism driven economy and its education and training sector. In particular, the policy makers' attempts at placing emphasis on facets of tourism activity other than gaming viz. MICE and heritage tourism were deliberated. The role of IFT in catering for the human resource requirements of the industry in Macao as well as its position in the APETIT network were also examined. *Inter alia*, the Institute's structure, study path, students and faculty profile were discussed. The contextual backdrop having been established in this chapter, the structure of the IFT curriculum is critically discussed in the following chapter.

CHAPTER 2 CURRICULUM IN TOURISM MANAGEMENT

2.1 Chapter Introduction

The status of tourism as a discipline is discussed in this chapter. Being a relatively new area of study in comparison with more established and conventional disciplines, the question 'whether tourism qualifies as a discipline in its own right?' is addressed. Drawing on discussions in published literature, this chapter also looks into the debate on the nature of the curriculum for equipping future managers in the industry with the required 'survival tools' and the factors influencing its effectiveness. This question is analysed from the contextual framework of generic education versus specialised training. Thereon, IFT's curriculum is explored within the ambit of this framework. The graduate employment profile is discussed in terms of the weight accorded to management related subjects vis-à-vis core courses associated with industry-skills.

2.2 Tourism as a Discipline

Conventional tertiary education is primarily identified with rule-based disciplines which are compartmentalised, having distinct identities in their own context. Matured disciplines have a set framework with time-tested delivery methods in form of lectures,

demonstrations and field work. They are characterised by an established body of theory derived from extensive research and debate, thereby providing the framework for a curriculum. The lecture method is the most frequently used instructional method in post-secondary education (McKeachie, 1990). Instructors structure reality into abstract or generalised representations that can be disseminated to the students who in turn can recall and apply the same in a professional situation (Yarusso, 1992). Modifications in syllabi, if any, prompted in recent times by innovations in Information and Communication Technology (ICT), tend to be within this established curricular framework. Students, as recipients of this pattern of education gain exposure and knowledge of standard solutions to known problems in the given discipline. As against this, a subject area, devoid of the credibility and status of a full-fledged discipline, has a more subjective approach but is nevertheless a topic of serious academic consideration. And unlike in the case of an established discipline whereby the approach is based on empirical evidence derived from investigation, a subject area is usually characterised by patchy, less structured research largely derived from case studies and historical precedents.

The growing economic significance of tourism has ensured it a status much beyond that of a subject area. Though Ritchie (1992) defines it as a *developing* science encompassing most of the well-established social sciences, it is beginning to emerge as a nascent discipline in its own right (Goeldner, 1988), even as its theoretical development is in a phase of consolidation. Hoerner (2000) propounds the term *'Tourismology'* to emphasise its credentials as a scientific discipline. By virtue of being one of the world's largest industrial sectors, tourism influences societal, governmental and educational circles thereby requiring an increasingly sophisticated educational infrastructure and a more competent workforce (Ritchie, 1988). At this stage, it is essential to clarify the distinction

between tourism education and hospitality education. The interrelationships and differences can be explored through a variety of contexts (Kuan-Chou and Groves, 1999). In a broader sense, *inter alia*, tourism as a discipline encompasses hospitality as well since overnight stay is an essential component of tourist activity though there is a body of opinion suggesting that the significance of hospitality within tourism is overemphasised (Stear, 1981). This view is corroborated by Gunn's (1998) observation that *'most curricula today do not include the full scope of tourism but rather focus on the hospitality industry'*. However, by itself, hospitality training tends to be more vocational in nature with stress on "how to do" (training) rather than "how to think" (education). Thus, whether as a stand-alone, hospitality education will qualify as a discipline in its own right is a moot point (Evans, 1988).

With the aim of avoiding repetition and inconsistency, for the purpose of this study, reference to tourism education will be made in a more holistic sense of the term so as to include hotel education as well. Distinction between the two will be highlighted at junctures where deemed necessary to illustrate a specific argument. On the basis of these arguments drawn from literature, there are sufficient grounds on which tourism merits the status of a discipline, albeit a nascent one. Having thus established the veracity of tourism as a discipline, the following section provides a discussion on the type of focus a degree programme in tourism management should accord in its curriculum that would work to the tourism graduate's advantage from a career perspective. As this research is primarily focused on the education/training for management careers in the industry, discussion on issues pertaining to lower end (non managerial/operational) jobs is excluded from the scope of the study.

2.3 Tourism: Education or Training?

As tourism is characterised by a multiplicity of disciplines, it eludes a unique definition. The same phenomenon can be viewed from different perspectives, each emphasising the particular area under study. Citing Cooper et al. (1993), the psychologist will emphasise consumer motivation, the economist will stress consumption, and the geographer will focus on territorial features, so on and so forth. Thus, despite being a discipline in its own right, this plurality makes it challenging to accord it a methodological treatment as well as to identify problems pertaining to educational requirements (Smith, 1988). The fragmented and diverse nature of the industry further pluralized by the different requirements of the hospitality and tourism components, acts as a deterrent to identify its requirements in a comprehensive and structured manner (Shepherd and Cooper, 1994). Jafari (1997; 179) stresses that *'the degree programme foci should be formulated with respect to the totality of tourism on whose behalf the future workforce is being developed'*. Citing this totality in the diversity of subjects that contribute towards tourism studies, Gunn (1991) calls for a multidisciplinary approach to tourism studies. Whether a degree level programme in tourism management should focus more on a generic knowledge based curriculum or emphasise on transferable skills (i.e. vocational) would depend on a host of inter-dependent factors, principal among them being the availability of qualified educators and local industry and market conditions. Effectively, this implies that curricula and programme structures in tourism studies need to be customised to the prevailing context. Smith and Cooper (2000) however caution that this contextual dependence notwithstanding, the curriculum needs to be context related and not context bound.

There are cogent arguments demonstrating the drawbacks of a generic knowledge based curriculum highlighting the contrast between tourism education and the actual needs of the industry (Amoah and Baum, 1997). Towards this end, Burton (1988) cautions on the negative fallout for the industry if the educational system is unable to produce the right type of graduates. In questioning the effectiveness of the admission criteria set by the educational institutions imparting tourism education, Ineson and Kempa (1997) provide another angle to this issue, namely that of appropriate selection procedures. Thus, it is evident that there are a multitude of inter-dependent variables including type of curriculum, quality of faculty and student selection criteria that determine the level and extent of a gap between the stakeholders' (educational institution, students and industry) expectations.

Haywood and Maki (1992) bring into focus the employers' emphasis on practical skills which are general and transferable vis-à-vis educators' proclivity for a more theoretical curriculum in tourism whilst students seek a quality education from the perspective of long-term career objectives. In Ross's (1997) research on relationships between tourism career preferences and educational expectations, problem solving (as opposed to vocational) emerges as the most favoured skill to be derived from the educational process. Ladkin's (2000) research on the other hand indicates that despite calls from the industry for increased management education, vocational training is a recognised career track to general management. This inference is partially supported by Dale and Robinson (2000; 33) who propose that *'tourism education should be more specialised in nature to meet the evolving needs of stakeholders'*. However, the necessity for generic management education is actually emphasised in the three-domain model propounded by Dale and Robinson

(2000) which incorporates generic, functional and product/market based themed degree routes. This plurality of opinions and diversity of findings underscores a contextual dependence as was emphasised by Jenkins and Shipman (1976). However, recent studies indicate that qualifications in tourism do not necessarily imply better career prospects in the industry (Sparrowe and Popielarz, 1995). This is further supported by findings that industry practitioners deem qualifications in general business administration to be of greater value than tourism qualifications (Cargill, 1995) which in turn validates Ross's (1997) findings on preference for problem-solving skills which are associated with business management studies. From this discussion, it is evident that a balance is necessary between narrow specialisation mandated by increased market segmentation on one hand and generic management skills as demanded by a 'global village' economy on the other (Bernthall, 1988). Smith and Cooper (2000) have emphasised the effects of globalisation on tourism facilitated by the recent developments in ICT and the necessity to incorporate these trends into the tourism management curriculum. It is interesting to note at this juncture that the World Tourism Organisation's multi-disciplinary model of subjects related to the study and research of tourism (WTO, 1995), which can be considered a more contemporary version of Jafari and Brent's (1981) seminal work on areas of knowledge in tourism education, whilst including a host of disciplines, overlooks ICT. ICT is rapidly permeating throughout the industry and no stakeholder can miss its impact (Poon, 1993), thereby impressing upon both educators as well as industry professionals the importance of acquiring relevant ICT knowledge (Cheung and Law, 2000).

Thus, a generic academic programme in management fortified with specialised courses in tourism and/or hospitality would provide the flexibility to incorporate contemporary trends in management philosophy which, in recent times have been primarily induced by ICT

(Tapscott, 1996) whilst simultaneously imparting the skills and concepts considered *de rigueur* for working in the industry. Such a value added programme would set the tourism management graduate apart from their peers with an education in business administration thereby transforming the fragmented and diverse nature of the industry from a liability to an asset. In the following section, IFT's curriculum in reviewed and analysed in terms of these arguments.

2.4 Analysis of IFT's Curriculum

IFT being a publicly funded institution, there have been debates, both internally as well as in the society and government on whether the existing curriculum with its emphasis on management education and emerging graduate profile are in consonance with the *raison d'etre* of IFT, which is purportedly to cater to the human resource requirements of the tourism and hospitality sector.

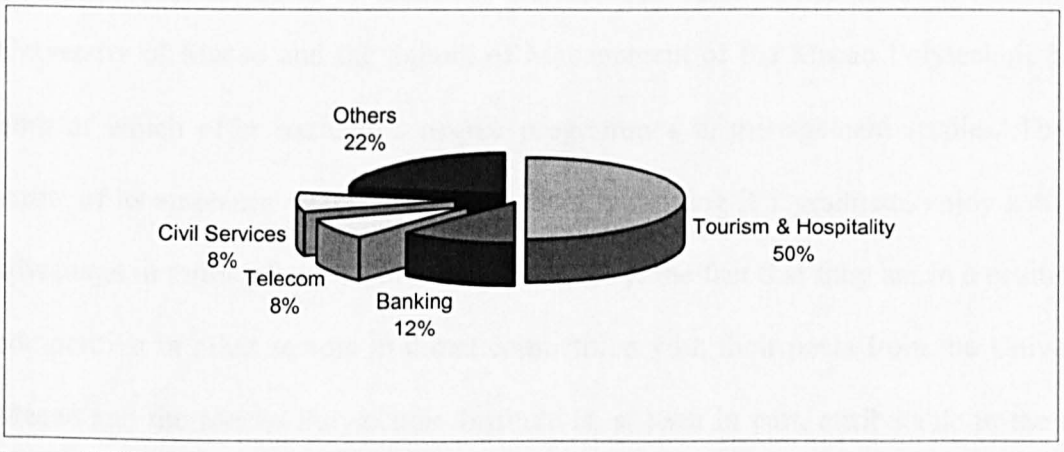
One school of thought opines that IFT should stay focussed on its primary objective i.e. to train graduates to work in the hospitality and tourism related areas. The training imparted to the students should render them eligible to work primarily within the industry. This school of thought cites Swiss hospitality training programmes which conventionally emphasise vocational training as role models. The University of Macao and the Macao Polytechnic Institute, among other tertiary institutions, which are also publicly funded entities offer programmes to train human resources for other sectors of the economy and any duplication towards this end by IFT by virtue of its academic programme would in

effect entail an unnecessary burden on the public exchequer. This view is largely espoused by academics specialising in hospitality related subjects (as distinct from tourism) who prefer a vocational programme as opposed to an academic one and their supporters in the industry and government who have traditionally conformist and conservative proclivities (Macau Hoje, 2000). This line of thinking is partly derived from the contention that there is a gap between the actual performance of the graduates and the expectations of the industry managers. Extensive exposure to conventional academic disciplines as part of the training is considered unessential. Lack of sufficient emphasis on vocational training in the curriculum reduces the market value of IFT graduates within the industry, compelling many of them to seek employment in other sectors. This entails a loss of potential talent for the industry, precipitating a shortage of skilled human resources. Thus reads the argument of this school of thought.

The alternative point of view espouses a knowledge based curriculum with strong emphasis on generic management skills in parallel to specialised training in industry related subjects. This school of thought finds support among the more *laissez-faire* elements in the society and those who have had exposure to or have taken on board contemporary management paradigms viz. business reengineering process (BRP) and e-commerce heralded by the ICT revolution. With traditional demarcation between segments of a rapidly globalised economy which is increasingly dominated by the tertiary (service) sector getting blurred, the manager of the future should be able to perform and deliver in this sector as a whole. To ensure this happens, a more holistic education is essential to groom future managers in the industry to become effective in a networked and interconnected economy. As opposed to operational skills, this school of thought places emphasis on conceptual and strategic proficiency. Besides, a more generic management

education provides the graduates with the necessary tools to compete in other sectors of the economy. As discussed in Chapter 1, the industry is characterised by long working hours and relatively low compensation packages, especially at the entry level. Besides, the industry's seasonal character limits its capacity to absorb workforce in significant quantities thereby entailing a mismatch between graduate numbers and job opportunities. These factors may deter prospective students with promising potential from seeking a career in the industry unless these concerns can be satisfactorily addressed. As opposed to an industry specific training with emphasis on practical 'hands-on' skills that risks placing limitations on the graduate's career opportunities, a generic management education with a 'tourism flavour' could, at least in part, address the problem by providing graduates with the necessary leverage to compete in the service sector *per se*.

Figure 2.1: Graduate Employment Profile



Source: IFT Registry

Given the relatively modest scale of operation of the industry in a small economy like Macao and the multidisciplinary nature of tourism, IFT's curriculum, besides equipping its students with the necessary skills to work in the industry purports to impart generic managerial skills that would render them eligible to work in other sectors of the service

industry viz. banking, telecommunications, education and the civil services. To illustrate this point, data from IFT's Registry reveal that as of March 2001, out of a total of 96 graduates, circa 81% had found employment in various sectors of the economy. As shown in Figure 2.1, of these, 50% were working in the industry whilst 12% found employment in banking, 8% in the telecom sector and another 8% in the civil services. The remainder, 22%, joined other sectors. IFT being a relatively young institution, the total number of graduates till date is not sufficiently high to merit an in-depth statistical analysis unlike in the case of the University of Macao and the Macao Polytechnic Institute which have been in operation for a much longer period of time and have significantly larger student-bodies in comparison to that of IFT. However, the graduate employment figures provide a glimpse of the marketability of IFT graduates in different sectors of the Macao economy. It needs to be highlighted at this juncture that in the job market, IFT graduates are in direct competition with their contemporaries from the Faculty of Business Administration of the University of Macao and the School of Management of the Macao Polytechnic Institute, both of which offer bachelor's degree programmes in management studies. Though by virtue of its emphasis on tourism and hospitality training IFT graduates enjoy a distinctive advantage in terms of employment in the industry, the fact that they are in a position to be competitive in other sectors in direct competition with their peers from the University of Macao and the Macao Polytechnic Institute is, at least in part, attributable to the existing knowledge based (as opposed to vocational) curriculum at IFT (see Appendix 3).

IFT's curriculum, established in 1995, is extensive in its coverage of language studies and management subjects (non-core courses) over and above industry-related courses (core courses). The study path (see Figure 1.1) allows the students to enter the job market after the third year of study upon successful completion of the diploma programme in tourism or

hotel management, depending on their choice of major. Appendix 3 provides a semester-wise breakdown of the subjects in both the streams (hotel and tourism) as well as in the fourth supplementary year of study. Classes in the supplementary year leading to the bachelor's degree in Tourism Business Management (TBM) are conducted after work hours so as to allow working diploma holders to attend. The distinction between hotel and tourism majors is made only up to the diploma level as the fourth year degree programme in TBM comprises of management subjects of the conceptual and strategic type (devoid of any operational courses and languages), six in each semester, carrying a total of thirty-six credit units common to all diploma holders, irrespective of their stream.

The weights accorded to core courses, the management subjects and the languages for the tourism and hotel streams up to the diploma level are correspondingly tabulated in the contingency tables (Table 2.1 and Table 2.2). The figures in the tables represent the credit units. The credit allocation for individual subjects per semester is presented in Appendix 3. The number of credits per subject per semester corresponds to the number of contact hours per week for the given subject. For instance, Mathematics I which is worth two credits, is a management subject common to both streams and is taught for two hours per week in the first semester. This equivalence of credits and number of contact hours per week applies to all subjects except the languages and the internship. The students are required to do two internships, each of four hundred working hours and carrying three credit units, during the summer break (July-August) following the first and second years of study.

Table 2.1 Distribution of Credit Requirements for Tourism stream

	Languages	Management	Core	Total
Year 1	12	19	17	48
Year 2	12	26	11	49
Year 3	12	28	9	49
Total	**36**	**73**	**37**	**146**

Figure 2.2: Percentage distribution of credits for Tourism stream

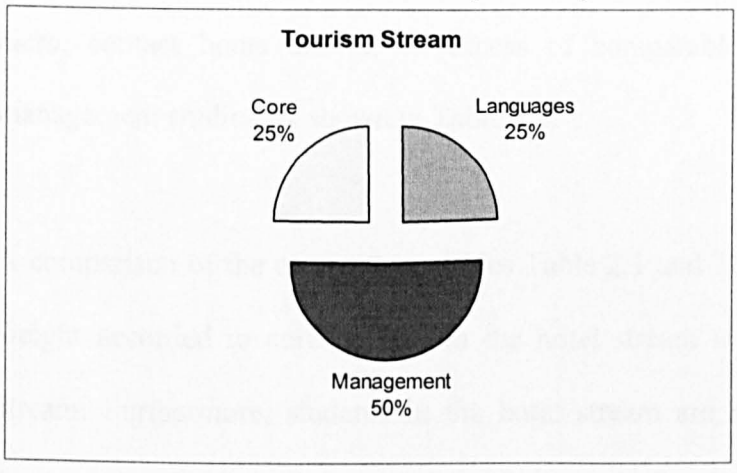
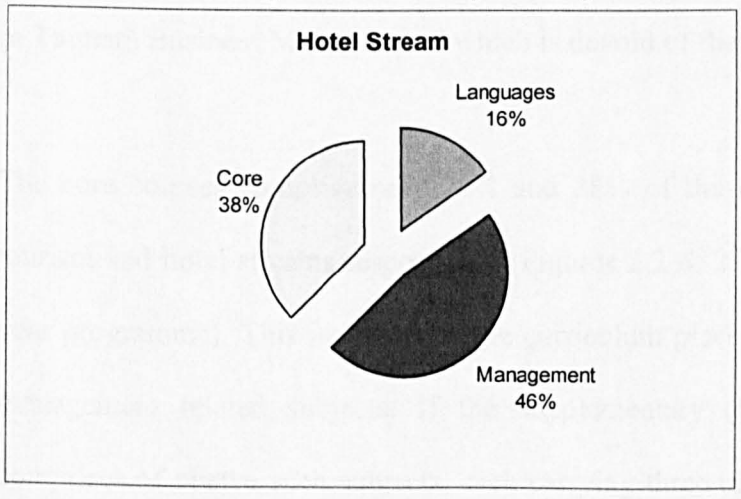


Table 2.2 Distribution of Credit Requirements for Hotel stream

	Languages	Management	Core	Total
Year 1	8	17	23	48
Year 2	8	24	23	55
Year 3	8	30	12	50
Total	**24**	**71**	**58**	**153**

Figure 2.3: Percentage distribution of credits for Hotel stream



All the subjects are compulsory as the programme structure does not provide for any electives. Thus, with such an extensive programme, students are subjected to over twenty-five contact hours of tutorials and practicum per week every semester in the first three years of their study. The minimum number of credits required in order to obtain a diploma in tourism is 146 whilst that for hotel management is 153. The credit requirements and *ipso facto*, contact hours are far in excess of comparable undergraduate programmes in management studies, as shown in Table 3.5.

A comparison of the contingency tables Table 2.1 and Table 2.2 clearly indicates that the weight accorded to core courses in the hotel stream is more than that for the tourism stream. Furthermore, students in the hotel stream are required to take four courses in tourism out of a total of twenty-seven core courses but there is no such requirement on part of the tourism students to study courses related to hotel operations, save for one subject "Principles of Hotel Industry". This strengthens the argument made in Section 2.2 that tourism, as a discipline, encompasses hospitality and that hospitality education in its own right does not have strong enough a case to qualify as an independent discipline. This is further reflected in the nomenclature of the degree awarded by IFT that reads as 'Bachelor in Tourism Business Management' which is devoid of the term 'Hospitality'.

The core courses comprise only 25% and 38% of the total credit requirements for the tourism and hotel streams respectively (Figures 2.2 & 2.3) up to the diploma level (three year programme). This implies that the curriculum places an overwhelming emphasis on management related subjects. If the supplementary (fourth) year programme which comprises of twelve such subjects, each carrying three credit units, is taken into account, the prominence of management related subjects is further consolidated to 60% and 57% for

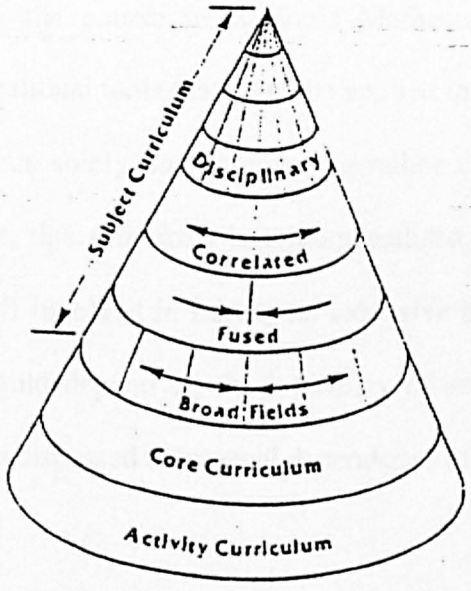
the tourism and hotel streams respectively. The weight of core courses is then diluted to 20% in case of the tourism stream and to 31% for the hotel stream. With the exception of sociology and history of Macao which form a part of the tourism curriculum, all the management subjects are common to both streams. The emphasis on management subjects seems slightly diluted in the case of the hotel stream in comparison to that of tourism. This 'parallax' is attributable to additional core course requirements mandated of the hotel stream students. The core courses in tourism are generally more theory oriented (knowledge based) in comparison to their counterparts in the hotel stream which tend to be more vocationally oriented. This provides for better integration of the tourism subjects in the pantheon of management courses which is in agreement with the arguments discussed in Section 2.3, and is consistent with the Tanner and Tanner's (1980) model of the curriculum which is reproduced in Figure 2.4. Apropos Figure 2.4, the lower strata (activity curriculum and core curriculum) of the cone represent the core courses component which comprises, as earlier stated, circa 20% of the degree programme for the tourism stream and 31% in the case of the hotel stream (Appendix 3). There is a degree of ambiguity in placing languages in any of the strata of Tanner and Tanner's cone. These can therefore be assumed to be "stand alone" or subsumed in the conic structure as auxiliary topics.

The strata representing subject curriculum characterises generic management education. The broad fields of study can be categorised into

- Business operations & functions
- Finance & Economics

- Social Studies
- Organisation Theory
- Quantitative Methods & Information Systems

Figure 2.4: Multidisciplinary model of education



Source: Tanner & Tanner (1980)

Inter and intra group subject areas can have overlaps and be correlated e.g. marketing research and consumer behaviour (intra); economics and statistics (inter). Thus, the strata characterising core courses, amalgamated with the strata representing management subjects epitomises the discipline of tourism studies which corresponds to the vertex section of Tanner and Tanner's cone. Given the distribution of weights between management subjects and core courses, an improvisation to Tanner and Tanner's model as shown in Figure 2.5 would be a better fit to IFT's curricular structure. As is illustrated in this figure, the strata representing management subjects form the foundations of the structure whilst the core courses are layered on top of the subject curriculum.

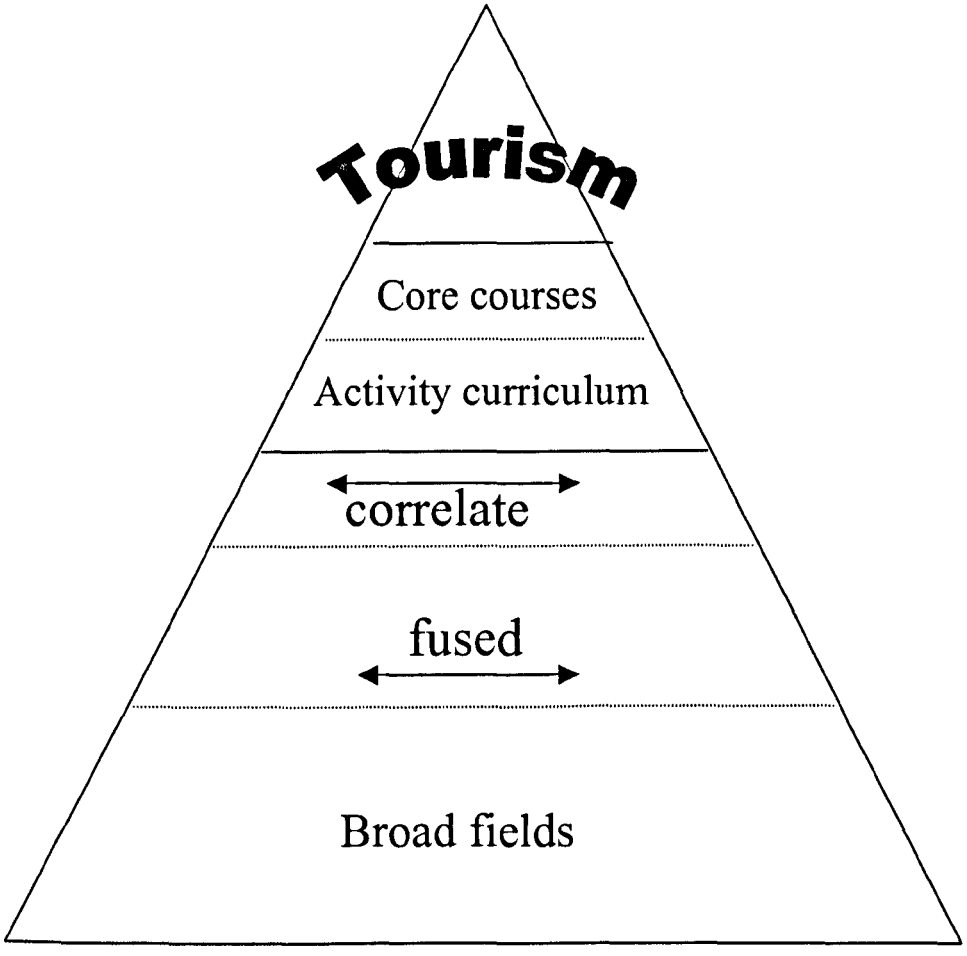
Curricula, irrespective of the discipline, have to contend with issues relating to overlaps and gaps. Having an extensive range of subjects, as in the case of IFT, accentuates the extent of overlap of topics between correlated subjects. For instance, the syllabus in Business Mathematics includes topics in financial mathematics viz. interest rates and time value of money. These topics also form part of the syllabus in Financial Management. Ideally, the course in Business Mathematics equips the students with the necessary computational tools that could be applied in subjects such as Financial Management, which can focus solely on the concepts rather than on computational methods. However, in practice, this symbiosis is seldom realised. As is evident from this discussion, there is a trade-off involved in having an extensive broad based curriculum and where to draw the line would depend on the inter-play of several correlated variables which validates the hitherto discussed contextual dependence of the curriculum (Smith and Cooper, 2000).

2.5 Chapter Summary

The growing economic impact of tourism has established its credentials as a discipline in its own right, even as its theoretical development is in a phase of consolidation. The same, however, cannot be said of hospitality unless it is viewed as an integral part of tourism studies. Hospitality training tends to be more functional in that it is focussed exclusively on developing job-related skills and information whereas tourism education which is inherently inter-disciplinary, aims at expanding the future manager's perspective of the human environment in the industry and beyond as well as providing the tools to cope with this environment. Thus, a holistic tourism education, which subsumes hospitality, is better

equipped to integrate new management paradigms which are being induced by an ICT-facilitated globalised work culture.

Figure 2.5: Multi-disciplinary model for Tourism Studies



The curriculum at IFT is extensive in its scope with an overwhelming pre-eminence of generic management subjects. This has stood the graduates in good stead in being able to compete for jobs not just within the industry which has, given its size, very limited

openings, but in the service sector as a whole. On the flip side, the curriculum places an excessive workload on the students in terms of the number of subjects they are required to study as well as the contact hours and thereby places a question mark on its effectiveness. The breadth of focus of the curriculum also accentuates the extent of overlap in the syllabi of related subjects. How the IFT curriculum compares with that of peer institutions offering tourism and hotel management programmes in the Asia Pacific region is discussed in the following chapter.

CHAPTER 3 COMPARISON OF CURRICULA

3.1 Chapter Introduction

In this chapter, a set of criteria is formulated based on which a degree of commonality in the curricular structure of IFT with that of other APETIT member-institutions that satisfy these criteria is established. The proliferation ratio and the coefficient of commonality have been propounded so as to quantify the extent of similarity in their curricular structures. Besides demonstrating the extent of similarity and differences in the curricula, the outcome of this exercise forms the basis for establishing a population of students studying in institutions offering tertiary level academic programmes in hospitality/tourism management in the Asia-Pacific region.

3.2 Issues in Comparison of Curricula

The contextual dependence of the curriculum was deliberated upon in Chapter 2. The comparison of the curricula of APETIT member institutions having a profile similar to that of IFT with the programme offered at IFT would provide an insight into the common context in which IFT operates from a regional perspective. As discussed in Chapter 1, the Network of Asia-Pacific Education and Training Institutes in Tourism (APETIT) was

the aegis of the United Nations Economic and Social Commission for the Asia and the Pacific (UNESCAP) in 1997 with the objective of fostering cooperation in the development of human resource capital in the tourism sector in the Asia-Pacific region. As opposed to a global perspective, the regional context, despite the enormous diversity within the Asia- Pacific zone, provides for an agreeable degree of commonality in terms of economic trends, geographical and socio-cultural proclivities. Thus, a comparative study of the curricula of member institutions of APETIT reinforces the common context within which they operate.

Similarities in the geographical context notwithstanding, the variety of educational systems and standards prevailing within the Asia-Pacific region imposes a limitation on the objectivity of such an exercise. Issues that pose a challenge in this regard are related to diversity in:

- range and depth of topics included in the subjects that comprise the curriculum
- sequencing of subjects in the academic programme
- nomenclature of subjects
- weight and/or credit allocation
- duration of the programme

So as to minimise the influence of variations induced by these factors, it is necessary to introduce a set of parameters that would allow for comparison of the curricula without the risk of gross over-simplification. In order to achieve this objective, an element of arbitrariness is unavoidable.

It needs to be highlighted at this juncture that curricula of the APETIT member-institutions offering degree/diploma programmes in tourism/hospitality management are being compared. The inclusion of generic management subjects in these programmes differentiate them from their purely vocational counterparts which are focussed distinctly on the development of specific industry related skills and hence, broadly targeted at training the non-managerial human resource component of the industry. Studies by Breiter and Clements (1996) have indicated that it is desirable for industry cadres aspiring to reach the management level to have a four-year academic degree. Given the substantial weight of generic management subjects in such programmes which was discussed in Chapter 2, the comparison is confined solely to these subjects which have been grouped into broad fields of study.

The vocational components of the curriculum differ according to the specialisation a programme has to offer. For instance, a degree programme in hospitality management focussing on catering will have a vocational training component different from that of a similar degree programme specialising in housekeeping whereas a non-specialised hospitality management programme would mandate the inclusion of both these components, albeit in less depth. Similarly, in the case of vocational courses in tourism management programmes, travel agency techniques, say, in Australia are different from those practised in the greater China region, making any comparison tenuous. Such variations in vocational skills training leave little ground for a cogent comparative investigation. Apropos the arguments discussed in Chapter 2, from an academic perspective, tourism as a discipline subsumes hospitality. Therefore, curricula targeted at grooming potential managers for the industry should essentially be regarded as

programmes in tourism management, irrespective of their focus on tourism or hospitality components. However, management programmes focussed solely on tourism will have little or no components of hospitality core subjects and vice-a-versa. Comparison of the curricula inclusive of core courses will therefore necessitate differentiating between hotel management and tourism management programmes, which, from the concurrent discussion, will be a superfluous exercise. Hence, so as to circumvent such incompatibilities, the core courses have been excluded from the scope of this study.

Language requirements in terms of depth and quantity vary significantly, depending on the country/region in which the APETIT member-institutions are located. Besides, they do not form a core component of the management curriculum and hence can be deemed dispensable for determining the extent of commonality of the curricula in tourism management programmes.

Thus, the comparison of curricula is confined to generic management subjects, which as mentioned earlier in this section have been grouped into broad fields of study. The rationale behind such clustering is discussed in Section 3.5. As is shown in Table 3.1, the subjects have been clustered into five groups. The column to the right contains the alpha-numeric codes for the fields of study and their corresponding subjects which shall be applied to the exercise of comparing the curricula in the Section 3.6 are listed in the left-hand side column.

Table 3.1 Grouping of generic subjects

Social Studies	**Group A**
Deontology	A1
History of Art	A2
Intercultural Relations	A3
Legislation	A4
Local History	A5
Sociology	A6

Organisation Theory	**Group B**
Human Resources Management	B1
Organisational Behaviour & Interpersonal Skills	B2
Principles of Management	B3
Social Psychology	B4
Strategic Management	B5

Business Operations & Functions	**Group C**
Consumer Behaviour	C1
Introduction to Business	C2
Marketing Research	C3
Public Relations & Communications	C4
Quality Management	C5

Finance & Economics	**Group D**
Accounting	D1
Cost Accounting	D2
Economics	D3
Financial Management Policy	D4
Project Evaluation & Analysis	D5

Quantitative Methods & Information Systems	**Group E**
Computer Applications	E1
Management Information Systems	E2
Mathematics	E3
Quantitative Methods for Decision Making	E4
Statistics	E5

3.3 Criteria for Comparison

Though APETIT was established as a network of tourism education and training institutions, its membership profile extends to non-academic entities as well which include national and regional tourism boards as well as training centres affiliated to airlines and hotel-chains. A comprehensive list of APETIT members is provided in Appendix 1. So as to identify the educational institutions in APETIT having a profile similar to that of IFT for the purpose of comparing the curricula, the following criteria were sequentially applied to the pool of APETIT member institutions.

- **Tertiary level academic Institutions**:

An exhaustive list of institutions accredited as APETIT members as of August 2001 was obtained from the APETIT website (APETIT, 2001). Entities other than tertiary level institutions (universities, polytechnics and institutes) were excluded. Inter alia, these were national and regional tourism boards and training centres affiliated to airlines and hotel-chains.

- **Similarity in entry requirements**:

Programmes having a common criterion for eligibility of admission were retained, the criterion being completion of secondary schooling (up to class 11 or 12, depending on the schooling system). As admission policies and practices differ from region to region, country to country and institution to institution, this criterion was deemed necessary to

characterise a semblance of uniformity in the students' profile in terms of age and educational qualifications at the entry level.

- **Degree/Diploma in Hospitality/Tourism Management**:

Academic entities other than those universities, polytechnics and institutes offering bachelor's degree programmes and/or diploma courses in hospitality and/or tourism management were excluded. It needs to be stressed at this juncture that on account of the diversity in the systems of education prevailing in the Asia-Pacific region, some degree programmes require three years for completion whilst others entail four years of study. Diploma level programmes which can be completed within two years tend to be more vocational in nature and hence have not been considered. Only those necessitating three years of full-time study were included. Table 3.2 lists APETIT member institutions offering degree/diploma programmes (ranging from three to four years in duration) in hospitality/tourism management.

Table 3.2 APETIT members offering degree/diploma in hospitality/tourism management

Country	Institute
Australia	University of Queensland
Australia	Victoria University of Technology
Australia	West Coast College of TAFE
Australia	International College of Hotel Management
Fiji	School of Hospitality and Tourism Studies, Fiji Institute of Technology
Fiji	University of the South Pacific
Guam	University of Guam
Hong Kong	Hong Kong Polytechnic University
Hong Kong	Hong Kong Technical College
India	Indo-American Hotel Management Academy
India	Shri Shakri College of Hotel Management
India	Oriental School of Hotel Management
India	North India Institute of Hotel Management
India	National Institute of Hotel Management
India	Academy of Culinary Education
India	Merit Swiss Asian School of Hotel Management

Country	Institute
India	Indian Institute of Tourism and Travel Management
India	Empee Institute of Hotel Management and Catering Technology
India	Canan School of Hotel Management
India	Nageshkar Memorial Hospitality Academy
Indonesia	Bali Hotel and Tourism Training Institute
Macao	Institute for Tourism Studies
Malaysia	Kolej Puncak Desa (Country Heights College)
Malaysia	Hotel and Tourism Academy
Malaysia	Renaissance Training Centre (RMH Training Centre sdn. bhd.)
Malaysia	School of Hospitality & Tourism Management, Sunway College
Malaysia	School of Tourism Management, Universiti Utara Malaysia
Malaysia	Universiti Teknologi MARA
Malaysia	Flamingo Institute of Further Education
New Zealand	Waiariki Institute of Technology
Pakistan	Pakistan Institute of Tourism and Hotel Management
Papua New Guinea	Lae Technical College
Philippines	Asia Pacific Tourism Training Institute
Philippines	Asian Institute of Tourism, University of Philippines
Philippines	International Tourism & Culinary Development School, INC.
Philippines	Punlaan School
Philippines	University of Santo Tomas
Thailand	Silpakorn University
Thailand	Siam University
Thailand	Siam Institute of Technology
Thailand	School of Hospitality Industry, Rangsit University
Thailand	Rajamangala Institute of Technology, Southern Campus
Thailand	Assumption University
Thailand	Rajabhat Institute Chiang Mai
Thailand	Prince of Songkla University
Thailand	Mahidol University International College
Thailand	Hotel and Tourism Training Institute
Thailand	Dusit Thani College

The entities listed in Table 3.2 can be construed to be a population of APETIT affiliated educational institutions in the Asia Pacific region sharing similarities in terms of academic programme and student profile in terms of the entrance requirements.

Table 3.3 List of entities precluded from study on account of lack of data

Institution	Country
Shanghai Institute of Tourism	China
Male Institute of Hotel & Catering Services	Maldives
Institute of Tourism Management	Mongolia
Hotel & Tourism Training Centre	Myanmar
Hotel Management & Tourism Training Centre	Nepal
Lae Technical College	Papua New Guinea
Ceylon Hotel School/School of Tourism	Sri Lanka

Also, on account of lack of data, seven educational institutions of the APETIT network could not be included in the study. One or more of the following factors precluded the study of the curricula of these seven institutions listed in Table 3.3.

- Absence of websites
- Lack of relevant information on the websites
- Availability of web-content solely in the local language (other than English)
- Non-response to e-mail requests for prospectus/course outlines

- **Subject distribution across disciplines**

The programme description and course outlines of the academic institutions in Table 3.2 were studied. Setting the distribution of weights between generic and core courses in IFT's programme as a benchmark (see Chapter 2), programmes comprising less than a third of generic management subjects in the curriculum were excluded from the scope of the study. This filtering was done so as to retain curricula having an academic slant and thereby preclude programmes with emphasis on vocational training.

Apropos the discussion in Section 3.2, the generic management (non-core) subjects have been clustered into five broad disciplines (see Table 3.1). Entities in Table 3.2 offering programmes with at least one subject in each discipline group have been retained. This criterion has been applied so as to ensure a more equitable distribution of weights between the disciplines in the curricula that are being considered for comparison. This also addresses the issues related to the overlap of topics between correlated subjects as well as differences in nomenclature which are deliberated upon in greater detail in Section 3.5.

The sequential application of the afore-described criteria to the list of APETIT members resulted in fourteen academic entities meeting the pre-defined eligibility requirements for the comparison of their degree/diploma programmes by virtue of which they can be considered as having profiles similar to that of IFT. Table 3.4 lists these entities and their geographical location which is followed by the criteria on the basis of which they were selected. The geographical spread of the locales in which these fourteen institutions are situated attests to a 'uniformity in diversity' among the APETIT member institutions. The left-hand side column contains alphanumeric codes corresponding to the respective educational institutions which will be applied in the contingency table (Table 3.5) discussed in Section3.6.

Some of the educational institutions listed in Table 3.4 offer more than one degree programme related to tourism management. For instance, Victoria University, Australia, offers bachelor's degrees in Hospitality Management, Hospitality/Tourism Management, Hospitality/Human Resource Management, Tourism Management and Tourism Management/Information Systems whilst the Hong Kong Polytechnic University offers a degree in Tourism Management with Hotel, Catering and Tourism sub-majors. These

programmes differ in terms of the course content, electives and weights attributed to various disciplines. For such educational institutions offering more than one degree in tourism management, the ones that find a mention in Table 3.4 have at least one programme satisfying all the aforementioned criteria.

Table 3.4 Academic Institutions with profile similar to that of IFT

Code	Institution	Country
I-01	Waiariki Institute of Technology (http://www.waiariki.ac.nz/Courses/)	New Zealand
I-02	Victoria University (http://www.businessandlaw.vu.edu.au/UGcourses.htm)	Australia
I-03	Asian Institute of Tourism (http://www.up.edu.ph/oar)	Philippines
I-04	Singapore Hotel & Tourism Education Centre (http://www.sha.org.sg/shatec_home.htm)	Singapore
I-05	Universiti Teknologi MARA (http://www.itm.edu.my/faculties/fhtm/index.htm)	Malaysia
I-06	University of Guam (http://www.uog.edu/cbpa/index.html)	Guam, USA
I-07	Hong Kong Poly University (http://www.polyu.edu.hk/%7Ehtm/main_acad.htm)	Hong Kong S.A.R.
I-08	Assumption University (http://www.au.ac.th/academic_affairs/)	Thailand
I-09	Dusit Thani College (http://www.dtc.ac.th/)	Thailand
I-10	Univ. of Queensland (http://www.talm.uq.edu.au/cour_under/bbusman.htm)	Australia
I-11	International College of Hotel Management (http://www.ichm.edu.au/course.html)	Australia
I-12	Merit Swiss Asian School of Hotel Management (http://www.meritworldwide.com/Merit-Hotel/course.htm)	India
I-13	Universiti Utara Malaysia (http://www.uum.edu.my/spp/index.htm)	Malaysia
I-14	University of Santo Tomas (http://www.ust.edu.ph/sitelinks/admissions/)	Philippines

Criteria for selection

- Members of APETIT network
- Tertiary level institutions (universities, polytechnics, institutes)

- 3 year diploma and/or 4 years degree programme in tourism/hotel management
- Curriculum comprises of one third or more subjects related to generic management disciplines (non-core courses)
- Similar entry requirements (post secondary school)
- Have a third of non-core courses (in terms of content) in common with the IFT curriculum, with at least one subject in each discipline group

3.4 Procurement of Course Details

The following procedure was applied to obtain programme details of the educational institutions listed in Table 3.2.

3.4.1 Internet search

The URL addresses of thirty-six out of the forty-eight entities in Table 3.2 were listed on the APETIT website (APETIT, 2001). The URLs of another eight institutions were traced through search engines. While some of these websites provided comprehensive information including course outlines (e.g. Victoria University of Technology, Australia) others gave only a peripheral overview of the academic programme bereft of any course details (e.g. Pakistan Institute of Tourism & Hotel Management). Websites of several institutions offered course information only in the local language (e.g. Rajabhat Institute,

Suan Dusit, Thailand). Overall, twenty-nine websites provided the necessary information on the curriculum.

3.4.2 E-mail Requests

An e-mail directory of APETIT members was procured from the APETIT website. E-mail requests for prospectuses were sent to twelve institutions whose websites could not be located or did not exist and also to the institutions that did not host the required information pertaining to the curriculum on their websites. Nine prospectuses were received in response via mail. University of Guam responded to the e-mail request saying that their programme was under review and brochures of the restructured programme would be mailed to the requester's address. At the time of completing this study, no further information was received. Hence, the existing curriculum was retained for comparison.

3.4.3 Library

IFT being an APETIT resource centre for consultancy services (see Chapter1), the prospectuses of nine APETIT member institutes in the possession of the IFT library could be consulted. The disadvantage of consulting most prospectuses is that they offer information on the study-path and the curricular structure but provide little or no information on individual course-outlines. The same applies to websites that did not provide detailed course outlines. In such cases, the comparison with other curricula is

restricted to course nomenclature. The grouping of subjects as illustrated in Table 3.1 and the criterion on having at least one subject from each of these groups in the curriculum were propounded precisely in order to address any inaccuracies relating to overlaps in topics and inconsistencies in subject nomenclature that may arise on account of lack of access to detailed course outlines.

3.5 Comparison Methodology

The course outlines of non-core subjects in the programmes offered by entities listed in Table 3.4 were studied. In terms of course contents, none of these institutions offered courses in non-core disciplines that were not offered at IFT, save for the Asian Institute of Tourism of the University of Philippines which offers courses in philosophical analysis and foundations of natural science and Assumption University, Thailand and the Waiariki Institute of Technology, New Zealand, which each offer a course in taxation. This validates the conclusions arrived at in Chapter 2 regarding an overwhelming pre-eminence of generic management subjects (non-core) in the IFT curriculum.

Issues pertaining to course nomenclature and overlap of topics posed a significant challenge in the exercise of comparison of curricula. Diversity in the system of granting of weights and/or credits allocated to the courses further exacerbated this challenge. For instance, the Hong Kong Polytechnic University offers a non-core course titled 'Quantitative Methods' worth three credit units, the contents of which are dominated by statistical methods in business while topics related to forecasting techniques are covered in

a core subject 'Hotel Occupancy Forecasting and Yield Management' which also carries three credit units. Whilst the former focuses on generic applications of statistics to business, the latter places emphasis on forecasting techniques as applied specifically in the hospitality sector. The mechanism for the procedures concerned in either case would be independent of the emphasis on generic business applications or specific industry focus but the nomenclature and classification of the subject (as being a core or generic course) would influence the inclusion or preclusion of that course for comparison of the curricula which is confined to non-core subjects in accordance to the prescribed criteria. The construction of Table 3.5 along with the attendant explanation aptly reflects this conundrum. To further emphasise this point, in contrast to the Hong Kong Polytechnic University, IFT offers two sequential courses in business statistics titled 'Statistics I' and 'Statistics II' respectively, each carrying two credit units which allows for a wider range of topics to be covered. Techniques in forecasting, *inter alia*, are taught in a subject 'Quantitative Methods in Decision Making' carrying three credit units. All these courses are classified as being non-core. Hence, as this particular case demonstrates, though the tools and techniques being imparted at the Hong Kong Polytechnic University and IFT bear a greater semblance of commonality, the nomenclature of subjects and consequently, their classification may, in certain cases, make this commonality appear more diluted, variations in depth and scope of these topics being taught notwithstanding.

From the above discussion, it follows that subject-by-subject comparison of curricula based solely on subject nomenclature and course content would be inadequate and fraught with glaring inaccuracies, the magnitude of which would significantly increase in proportion to the quantum of curricula being compared. To minimise the influence of these inadequacies on the reliability of the comparison of curricula of the fifteen APETIT

institutions listed in Table 3.4, the individual subjects were grouped into broad categories, based on their inter-relatedness. Though such an approach may not redress the issue of inadequacy of classifying a course as core or non-core based on the nomenclature, it would diminish the discrepancies related to overlap of topics and differences in nomenclature with respect to subjects already having qualified into the non-core category. Thus, for instance, business forecasting which is a topic covered in the non-core course 'Introduction to Statistics for Business and Economics' offered in the Bachelor of Business Management in Tourism and Travel Management programme at the University of Queensland, Australia is, as described in the preceding paragraph, taught at IFT as a component of the course 'Quantitative Methods in Decision Making' and not 'Statistics I' or 'Statistics II', all of which are non-core courses. Therefore, by grouping together inter-related subjects (e.g. quantitative subjects that require analytical and computational skills) and introducing criteria for exploring the element of commonality in between these groups instead of stand-alone subjects allows for a more robust mechanism for comparison of curricula. This approach provides the rationale for the grouping of subjects in Table 3.1 and framing of the relevant criterion of having a minimum of a third of non-core courses (in terms of content) in common with the IFT curriculum, with **at least** one subject in each discipline group for comparison as discussed in Section 3.3. Having provided the rationale for clustering of subjects and criteria for comparison of curricula and their attendant shortcomings in this section, the following section discusses the outcome of this exercise on the actual comparison of curricula.

3.6 Outcome

In Chapter 2, it was demonstrated that there is an overwhelming emphasis on generic management disciplines in IFT's curriculum. As stated at the beginning of the preceding section, save for a couple of exceptions, none of the APETIT institutions short-listed in Table 3.4 offered courses in non-core disciplines that were not available at IFT. Therefore, IFT's curriculum (restricted to non-core courses) which is comprehensive though by no means exhaustive, was applied as the baseline for the purpose of comparison of curricula of entities listed in Table 3.4. The outcome of this comparison is summarised in Table 3.5.

The entries in the first row of Table 3.5 correspond to the groups of non-core subjects whilst those in the second row are alpha-numeric codes that correspond to the respective subjects as listed in Table 3.1 . These entries cover all the non-core courses taught at IFT and serve as a baseline for determining the similarities in curricular structure between the fourteen eligible (by virtue of the selection criteria) APETIT institutions and IFT. The elements in the first column from the left are alphanumeric codes that correspond to these APETIT institutions listed in Table 3.4 in accordance to the selection criteria laid out in Section 3.3. For the sake of completeness, IFT has been included in the comparison chart. The shaded cells in the interceding columns and rows indicate that the corresponding subjects are being offered by the corresponding institutions. For instance, in the case of IFT, all the cells in the corresponding row have been shaded as its non-core curriculum has been adopted as a baseline.

The contingency table (Table 3.5) allows for gauging the extent of proliferation of the non-core subjects among the fourteen APETIT member-institutions as well as the degree of commonality each of them have with IFT in terms of their curricular structure for these subjects. The magnitude of proliferation for a given subject is characterised by the proliferation ratio which is computed by dividing the number of institutions offering the subject by the total number of institutions under study, in this case, fourteen. IFT has been excluded from the count since its non-core curriculum has been used as a baseline. To what extent the curricular structure of a given institution is common to that of IFT is measured by the coefficient of commonality which is defined as the ratio of the number of non-core subjects from among those listed in Table 3.1 offered by that institution to the total number non-core subjects offered at IFT, which in this case is twenty-six. A column-wise analysis of Table 3.5 reveals the extent of proliferation of a given subject in the curricula of the fourteen institutions under study. Table 3.6-a provides the proliferation ratios of these subjects. For instance, Accounting (D1) is offered by all the fourteen institutions, thereby having a proliferation ratio of 1 whilst Statistics (E5) which is being offered by twelve of the fourteen institutions has a proliferation ratio of 0.86. It is interesting to note that Consumer Behaviour (C1) has a zero proliferation ratio. However, this does not necessarily imply that topics in consumer behaviour are not taught at any of the fourteen institutions. Unlike IFT, none of these institutions offer a course under a separate subject heading "Consumer Behaviour" but some or all of the topics related to this concept could be subsumed under a related course such as marketing research which has a high proliferation ratio of 0.86. It was precisely to minimise the influence of these types of anomalies that the criterion of having a minimum of a third of the non-core courses (in terms of content) in common with the IFT curriculum, with **at least** one subject in each discipline group for comparison was applied.

Table 3.5 Commonality of Curricula among APETIT Institutions with profile similar to that of IFT

Subjects	Group A						Group B					Group C					Group D					Group E				
	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5	E1	E2	E3	E4	E5
Institutions																										
IFT	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
I-01				■			■	■			■			■	■		■	■	■	■		■	■		■	■
I-02				■			■	■	■					■			■		■	■		■				■
I-03			■	■			■	■					■	■	■		■		■	■		■		■		■
I-04				■					■					■	■		■		■				■	■		■
I-05			■	■			■		■					■			■		■			■	■			■
I-06	■			■			■	■	■					■			■		■	■			■		■	■
I-07				■			■	■			■				■		■		■		■	■	■		■	
I-08					■		■							■			■	■		■	■	■	■			
I-09	■		■	■					■				■	■	■		■		■	■		■		■	■	■
I-10				■				■	■					■	■		■		■	■			■			■
I-11		■					■	■						■	■	■	■	■			■		■			■
I-12				■			■				■			■	■	■	■		■	■		■				■
I-13	■		■	■	■			■	■					■			■		■	■			■	■		■
I-14	■		■	■	■	■		■							■		■			■		■		■		■

The proliferation ratios of the subject groups (instead of the individual subjects) listed in Table 3.6-b provide an indicator of the extent of domination of the corresponding areas of discipline in the curriculum. The proliferation ratio for a given area of discipline represents the arithmetic mean of the proliferation ratios of the individual component-subjects.

Table 3.6-a Proliferation Ratios (P.R.) for Non-core Subjects

Code	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2
P.R.	0.29	0.07	0.36	0.86	0.21	0.07	0.64	0.64	0.50	0.00	0.21	0.00	0.14
Code	C3	C4	C5	D1	D2	D3	D4	D5	E1	E2	E3	E4	E5
P.R.	0.86	0.64	0.14	1	0.21	0.79	0.64	0.21	0.64	0.64	0.43	0.29	0.86

Table 3.6-b Proliferation Ratios for Subject Groups (Disciplines)

Code	***Group***	**P.R. (Groups)**
A	Social Studies	0.31
B	Organisation Theory	0.40
C	Business Operations & Functions	0.36
D	Finance & Economics	0.57
E	Quantitative Methods & Information Systems	0.57

As is evident from Table 3.6-b, Finance & Economics and Quantitative Methods & Information Systems are the disciplines that have the highest proliferation ratios, thereby underlining the significance accorded to actuarial and numerical competencies in tourism management education.

Computer Applications (E1) and Management Information Systems (E2) characterise the generic component of education in ICT i.e. non-industry specific applications. Industry

specific ICT applications are covered in core subjects. For instance, in the case of IFT, instruction in the property management system (PMS) software Fidelio forms a part of the course content of the subject Theory & Practice of Front Desk which is a core course for hotel management majors. Similarly, software such as Abacus which is a computer reservation system (CRS) is taught as part of the subject Travel Agency Techniques, a core course for students majoring in tourism management.

There was no discernable homogeneity in the course contents of Computer Applications (E1) and Management Information Systems (E2) among the fourteen institutions. Courses in Computer Applications typically included the following generic application software:

- word processing
- design & graphic applications
- desktop publishing
- website design
- electronic communications & the Internet

Management Information Systems comprised of topics dealing with:

- spreadsheet design & implementation
- database management systems (DBMS)
- file management (compression/decompression, file transfer protocol and file conversion)
- e-commerce

Apropos Table 3.6, both these ICT focussed subjects demonstrate a moderately high proliferation ratio of 0.64. All the fourteen institutions offer at least one of these two courses with Waiariki Institute of Technology, Universiti Teknologi MARA, Hong Kong Poly University and Assumption University offering both. Whether a course is mandatory or offered as an elective needs to be taken into consideration within the context of this discussion. This information was not available in all the cases. However, in most instances, generic/non-core courses tend to be compulsory.

A row-by-row examination of Table 3.5 provides an indication of the extent to which each of the fourteen APETIT member-institutions' curricula overlap with that of IFT. The differences in magnitude of the coefficients of commonality of the fourteen institutions vis-à-vis IFT as observed from Table 3.7 testify to the extensive scope of IFT's curriculum in non-core subjects, thereby supporting the conclusions arrived at in Chapter 2 on the overwhelming pre-eminence of generic management subjects in the degree programmes offered at IFT. The Waiariki Institute of Technology and Dusit Thani College have the highest value for the coefficient of commonality (C.C.) which equals 0.54 whilst Victoria University and Assumption University each with a magnitude of the coefficient of commonality equalling 0.35 score the least. The criterion of having a minimum of a third of the non-core courses (in terms of content) in common with the IFT curriculum, with **at least** one subject in each discipline group places a lower bound on the coefficient of commonality at 0.33. Thus, $0.33 \leq \text{C.C.} \leq 1$

Table 3.7 Coefficients of Commonality (C.C.)

Institution	C.C.
IFT	*1.00*
Waiariki Institute of Technology	0.54
Victoria University	0.35
Asian Institute of Tourism	0.50
Singapore Hotel & Tourism Education Centre	0.35
Universiti Teknologi MARA	0.42
University of Guam	0.46
Hong Kong Poly University	0.42
Assumption University	0.35
Dusit Thani College	0.54
Univ. of Queensland	0.38
International College of Hotel Management	0.42
Merit Swiss Asian School of Hotel management	0.42
Universiti Utara Malaysia	0.50
University of Santo Tomas	0.46

3.7 Limitations

The study on the comparison of curricula of the fourteen educational entities with that of IFT is beset with limitations that could bear an influence on its outcome. These limitations are a consequence of the following factors:

- **Variations in the availability of course contents:** The availability of course contents for the non-core subjects in the fourteen APETIT member-institutions ranged from cursory course objectives and outlines of topics to detailed course description. In the absence of detailed course descriptions, the comparisons were made on the basis of course objectives and outlines, where available.

- **Diversity in the credit system:** The system of allocation of credits and weights varies from institution to institution. Lack of uniformity in this aspect required this parameter to be precluded from the scope of the study.

- **Differences in course duration:** There was no discernable uniformity in the longitudinal scope of the subjects. While some institutions offer a subject for the length of a term, others require students to study the course for two and in some cases three terms. The issue was further complicated by the fact that certain institutions operate on a trimester basis whilst some adhere to a semester system. This also has a bearing on the number of hours a given subject is taught per week.

- **Elective and non-elective subjects:** Though generic/non-core subjects tend to be largely mandatory, there is a non-negligible number of cases wherein a non-core subject may be offered as an elective. Thus, not all the students enrolled in a programme will be required to read for a given subject if it is offered as an elective.

- **Overlap of topics:** Topics covered in a subject offered by one institution may form part of the syllabus of a different subject offered at another institution. In certain cases wherein the topics are taught as a part of a subject within the context of the industry, the subject is classified as a core course and is therefore precluded from the scope of the study.

3.8 Inference

The hitherto discussed limitations notwithstanding, this exercise in comparison of the curricula of APETIT member-institutions has demonstrated a degree of commonality in their curricular structure within the framework of a set of predefined criteria. Hence, these fourteen institutions can be construed to have a profile similar to that of IFT. Based on this outcome, the existence of a unique population, the exhaustive set of elements of which can be defined as the collective of students of these fourteen institutions and IFT, can be established. The implications of this inference are that the results of a study of an empirical nature performed within the ambit of any one of these fifteen institutions can, with a reasonable degree of confidence, be extrapolated and applied to the other fourteen. Relaxing the criteria set in Section 3.3 would further expand the applicability of this study to other APETIT member-institutions. The common context within which IFT operates in the region is thereby demonstrated.

3.9 Chapter Summary

The methodology adopted in this chapter focussed on minimising the fallout of the lack of homogeneity of a host of factors on demonstrating a measure of semblance in the curricular structure of APETIT member-institutions. Towards this end, inter-related subjects were clustered into groups and pertinent criteria for comparison were introduced. Limitations imposed by the adoption of such a methodology were also discussed. Measures such as proliferation ratio and coefficient of commonality were propounded, thereby

providing a tool to quantify the concept of similarity in curricular structures of academic institutions not governed by common regulatory guidelines. Using these measures, the level of proliferation of non-core subject areas among the qualifying APETIT member-institutions was explored, though the lack of availability of sufficient level of details pertaining to their course composition in certain cases has placed limitations on a more thorough scrutiny of the extent of their commonality.

Based on the outcome of the comparison of curricula of these qualifying APETIT member-institutions, the common context within which IFT operates in the Asia-Pacific region was established. The significance of this conclusion is that the results of a study or an experiment performed on the students at IFT can be construed to be applicable to students studying at other APETIT member-institutions whose curricula as has been established, bear a degree of commonality with that of IFT. IFT students could thus be considered as a convenience sample drawn from a unique population comprising students from APETIT member-institutions. The following two chapters delve into the ICT syllabus in tourism management education and the sixth chapter attempts at gauging the influence of ICT as a teaching tool on IFT students' performance in an actuarial subject, using an empirical approach. The conclusions arrived at as a result of these modules will help consolidate the role of ICT in identifying and narrowing the gaps between industry requirements, students' perceptions and the education imparted to them at IFT, possibly through redesigning of the curriculum. The lessons derived as a result could be considered as being applicable to other APETIT member-institutions based on the inferences arrived at in this chapter.

CHAPTER 4 ICT COMPETENCIES IN TOURISM EDUCATION

4.1 Chapter Introduction

As discussed in Chapter 1, the tourism sector which is a major contributor to the global GDP has been witnessing a phenomenal growth over the years, temporary setbacks such as the September 11, 2001 attacks in the USA and October 12, 2002 tragedy in Bali, Indonesia with their attendant ramifications on the industry notwithstanding. The information age that has brought about the globalisation of the marketplace has induced a qualitative as well as a quantitative transformation in the industry, consequently fuelling and sustaining its impressive growth rate on a year-on-year basis. Negroponte (1995) and Tapscott (1996) identify the convergence of information technology, telecommunications and content as the single-most significant event shaping the future. Naisbitt (1994) singles out ICT as the paradigm sector of the twenty-first century driven by the economic engine of the travel and tourism industry. This brings into focus the role of ICT in tourism education geared at fostering the necessary skills in potential managers in the industry to survive, nay, thrive in an information intensive globalised work environment. The benefits that accrue from the infusion of ICT into the curriculum can be gauged not only from the composition of the syllabus that equips the students in a tourism business management programme with specific techno-savvy skills to be employed in future careers but also from the tools that ICT provides in facilitating the learning process itself across a range of disciplines that form part of the curriculum of such a programme. In so far as assessing the

influence of ICT skills gained during the education process on career prospects is concerned, it is necessary to solicit the opinion of stakeholders in the industry, viz. employers, educators and students. Measurement of the impact of ICT as an instrument for enhancing the learning process can be achieved by means of empirical studies such as, for instance, setting up a quasi-experimental design wherein, for a given subject or discipline area, the extent of ICT in form of computer aided instruction (CAI) is subjected to variation in magnitude on a cohort-by-cohort basis and the inter-cohort performance is compared with the aim of establishing a correlation between the extent of CAI included in the teaching/assessment process and the cohort's performance. These issues are addressed in the subsequent chapters. Their outcome, however, will be influenced by the actual ICT competencies to which the students are exposed by virtue of the nature of contents of the syllabi in ICT related subjects, which forms the topic of discussion of this chapter.

4.2 Tourism Sector and ICT

Though the role for ICT as a catalyst for competitive positioning in businesses was recognised as far back as the mid-1980s (Porter, 1985), it was not until *circa* a decade later that its strategic potential was acknowledged by the tourism and hospitality industry (Olsen, 1996, Cline and Blatt, 1998). This, despite the widespread application of ICT at the operational level in the form of computer reservation systems (CRS) in the 1970s and the global distribution systems (GDS) in the 1980s which were pioneered by the airline industry and subsequently adopted by hotel chains and travel businesses (Truitt, et al, 1991, Sheldon, 1997). The dawn of the age of the personal computers (PCs) coupled with

the advent of the Internet has enabled creation and distribution of multimedia content and thereby spurred the interactivity between suppliers and consumers (Bubley and Bennett, 1994). The ICT revolution has induced enterprise resource planning (ERP) and business processes reengineering (BPR) in virtually all sectors of the economy and tourism is no exception. In its wake, this has created a demand for management cadres having high order problem solving and multitasking skills as well as the dexterity to switch jobs within and without the sector and adjust to different types of employment cultures (Capelli, 1993). Thus, managers, irrespective of their specialisation, are required to be *'IT enlightened'* (Caldwell, 1998). With the objective of producing such managerial talent, business and management schools have responded to the call from industry practitioners by making extensive efforts at integrating ICT into their academic programmes (Crowley, 1997). To what extent this response has conformed to the needs of the tourism industry is an issue that merits further deliberation. As Strassmann (1999) has underlined, mere investment in ICT does not guarantee profitability and doubts have also been expressed in the past on the extent to which ICT can add value to an organisation's performance (Gamble, 1990). That in no way implies that steering clear from ICT is an option that businesses could contemplate as this would result in '*strategic vulnerability leading to competitive disadvantage*' (Bradley, Hausman and Nolan, 1993; 87). This discussion points to the fact that ICT is a mere tool and its potential to generate knowledge rests on the optimality that can be achieved at the level of human-ICT interface, which in turn underscores the significance of education and training in maintaining and developing such an asset (Buhalis, 1998).

With reference to tourism, Dutton (1997) cautions of the potential threat to the future growth of this sector by the perceived chasm between what is taught in the ICT syllabi of

tourism and hospitality management programmes and what ought to be taught so as to mould the students in accordance to the industry's management skills prerequisites. Such a gap could be attributed to either or all of the following factors:

- Limited interaction between industry and academia.
- Shortage of suitably qualified faculty
- Lack of sufficient resources

The potential of ICT in bridging this gap would require further research into its role as a pedagogic tool in the form of computer aided instruction/assessment (CAI) (Davis, 1999) as well as study of the nature and type of topics in ICT to be incorporated into computer courses in the tourism and hospitality programmes (Kluge, 1996). These issues constitute two of the principal focal points of this thesis. Whilst the role of computer aided instruction/assessment in a given subject of the tourism business management programme at IFT is addressed in Chapter 6, the subsequent section in this chapter examines the contents and applications of ICT courses imparted to IFT students majoring in tourism business management. The perceived relevance and utility of these from the point of view of the stakeholders are discussed in the following chapter.

4.3 Focus of ICT Syllabus in Tourism Education

In Chapter 2, the design of the curriculum in the tourism business management programme with reference to the relative emphasis of core industry specific subjects vis-à-vis generic

management disciplines was deliberated upon. The debate on the appropriate balance between the core and non-core components of the curriculum is, by extension applicable to the ICT syllabus. Mistilis and Daniele (2000) pose the critical choice between ICT syllabi in tourism management programmes that lay emphasis on education in information literacy and strategic issues in implementation of ICT in tourism and those that purport to impart skills that the industry requires predominantly for operational functions. It was highlighted in Section 1.3 of Chapter 1, that the World Tourism Organisation's (WTO) multidisciplinary model on education and research in tourism, while drawing on a host of other disciplines has precluded ICT as a discipline in its own right. However, in its effort to develop a standardised framework for the tourism ICT syllabus taught in educational institutions affiliated to it, as part of its GTAT (Graduate Tourism Aptitude Test) programme, the WTO has recognised the significance of ICT and has placed emphasis on addressing the strategic and managerial aspects of technology rather than focussing merely on a skills-training approach (Sheldon, 2001). This direction is in consonance with IFT's overall curricular structure which stresses precisely on such strategic and managerial aspects in the form of what has been defined as non-core subjects in Chapter 2 and is also validated in the syllabi of ICT related subjects taught at IFT, a narrative on which ensues herewith.

While recognising the significance of imparting training in industry specific applications, the accent of ICT education in IFT is on generic end user skills and conceptual and strategically focussed applications. ICT permeates the IFT curriculum by virtue of dedicated technology modules as well as through its incorporation as a sub-topic in other subject areas. Figure 4.1 provides a matrix of applications to which IFT students are exposed during the course of the four years degree programme.

Figure 4.1 : Matrix of Topics in ICT Syllabus

Strategic		• Access • Computer Theory • Excel • Internet • Project • SPSS
Operational	• Abacus • Fidelio • Macro	• Outlook • Daceasy • Front Page • Pagemaker/Visio • Power Point • Word
	Industry specific	**Generic**

The applications have been grouped into their designated quadrants depending on their type (whether industry specific or generic) along the horizontal axis and value (whether operational or strategic) with respect to the vertical axis. Applications like Excel and Internet browsers can be considered to have operational utility as well. However, given the significance of their potential as conceptual and strategically focused tools which set them apart from their other generic counterparts with pure operational value, these applications have been placed in the Generic/Strategic quadrant without repetitive mention in the Generic/Operational quadrant. The Generic/Strategic quadrant has been highlighted in Figure 4.1 to distinguish it from others, given the significance of the applications enlisted therein in the development of managerial competencies which forms one of the core topics of investigation of this research. On the other hand, Daceasy, though a specialised accounting package, is not specific to the tourism industry alone. Its primary function is concerned with creation and maintenance of accounts, balance sheets and financial

statements which could be regarded as routine operations. Thus, despite being a software package geared at numerical applications, Daceasy has a very limited strategic relevance and hence its place in the Generic/Operational quadrant. The industry specific applications are designed to enhance operational efficiency as opposed to effectiveness which usually forms the hallmark of a strategic application. Hence, from the conceptual context, these have limited scope, thereby being restricted to the Industry specific/Operational quadrant. Thus, in absence of any industry specific strategic application, the core ICT skills and competencies required of a tourism professional can be classified into three broad categories (a) industry specific applications (b) end user applications (c) conceptual and strategically focussed applications (Buhalis and O'Connor, 2001) which are discussed within the context of IFT's curricular structure hereunder.

a) Industry Specific applications: Modules in which these applications are taught, are designed to provide tourism and hospitality students a hands-on exposure to systems structured specifically for use in the tourism and hospitality industry. Students majoring in the Hotel stream are imparted training in Fidelio, one of the major Property Management Systems (PMS) in use in the hotel business in the Asia Pacific region as well as Macro, which is a Restaurant Management System (RMS). Training in the usage of pertinent aspects of these systems is subsumed in the corresponding core hospitality courses such as Rooms Management, Food and Beverage Management and Hotel Operations. Students specialising in the Tourism stream are trained in the usage of Abacus, one of the more widespread Global Distribution Systems (GDS) in conjunction with other aspects of travel agency operations taught in tourism core courses such as Travel Agency Techniques. Appendix 3 includes the list of core courses for both streams along with the non-core subjects. The procurement, operation and maintenance of industry specific systems viz.

PMS, RMS and GDS can be an expensive proposition as these require customised hardware configuration and being proprietary in nature, are generally not compatible with other systems. Their functionality and application are confined to within the industry and are primarily targeted at enhancing operational efficiency. Thus, their utility as a strategic tool in managerial decision making is fairly limited. Nonetheless, training students in the usage of such systems is considered *sine qua non* on the premise that they will have to work with identical or similar systems in the initial phases of their careers. The validity of such a justification has been questioned on the grounds that there being a proliferation of PMS, RMS and GDS, familiarity with one does not necessarily imply ease of use with another (Buhalis and O'Connor, 2001). Thus, given the constrained scope of such systems and their principal focus on operational efficiency, their contribution to the development of strategic managerial skills in the students can be considered to be of limited value and thereby not meriting further consideration in the development of this thesis, given its stated focus.

b) End user applications: These applications are generic in nature and tend to be introduced at the beginning stages of the programme. The course content is primarily targeted at students with little or no exposure to basic computer operations. However, with the spur in the penetration of ICT at the pre-university level, the target audience that would derive benefit from such courses are steadily shrinking. These applications serve as a valuable instructional tool in form of computer based learning (CBL) wherein ICT is used as the primary means of knowledge dissemination, independent of other instructional methodologies. The end user skills in terms of word processing (Word), presentation tools (Power Point), e-mail communications (Outlook) and searching for information on the Internet are considered absolutely essential for the students, irrespective of their area of

specialisation as these would be of practical use throughout their student life as well as in their careers. These topics constitute the syllabi of Introduction to Computers I & II which are non core subjects taught in the first year of study at IFT. Such applications belong to standard software suites that enjoy wide penetration among PC users and are regarded as tools for enhancing efficiency of routine professional transactions, thereby focusing on practical computer skills rather than on strategic and conceptual issues. However, familiarisation and fluency in the use of end user applications contributes towards developing competence and confidence among students to interface with ICT and harness the accruing benefits to their professional advantage. As Cho and Connolly (1999; 35) stress, in using ICT, students must '*learn to apply an enterprise-wide mentality*'.

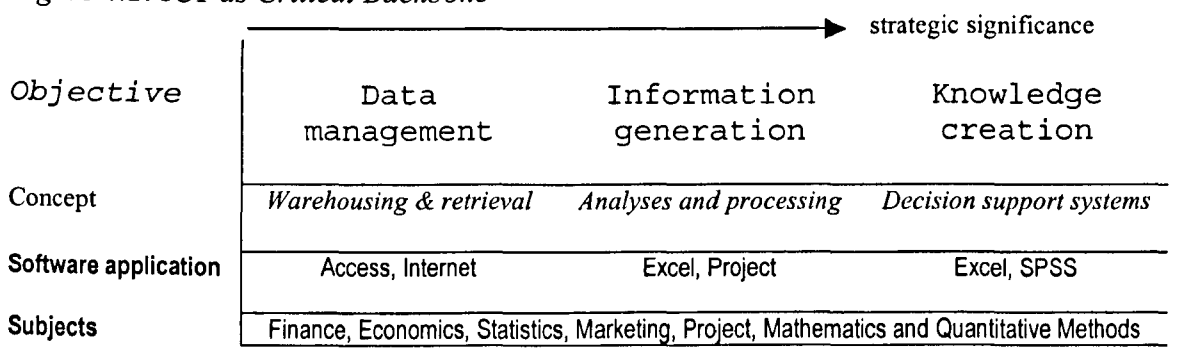
c) Conceptual & Strategically focussed applications: These applications provide the students with strategic decision making tools which are *de rigueur* for practising managers. As such, these tools are actually applied or have the potential of being applied in subjects that include concepts related to planning, data collection and preparation, modelling, forecasting, optimising and reporting. For instance, Computer Theory provides a theoretical basis for introductory concepts related to hardware, software and networking. The basic knowledge of operating systems, platforms and networking architecture is essential from the perspective of developing abilities to formulate corporate ICT strategies. Project, which is a common subject for both hotel and tourism streams incorporates extensive usage of Project software as a planning and budgeting tool for the annual Industry Night event organised by the third year students which normally involves preparation and planning throughout an entire semester. Data collection, warehousing and mining concepts are introduced as part of a dedicated course in Information Systems Management taught at the year three level. Accessing external databases on the Internet

and developing relational database management systems (DBMS) on an Access platform are the specific skills that are imparted in this course. These skills are deemed relevant in marketing related subjects as well as most of the Group D and Group E subjects apropos classification in Table 3.1. The use of SPSS, a specialised statistical analysis package, is integrated into the Marketing and Marketing Research courses taught in the third and fourth year of study respectively. Though a specialised package for statistical analysis, SPSS provides a powerful platform for specific marketing analysis situations. However, its lack of versatility as a tool for developing models, say, for performing 'what if' analysis which are critical to decision making as well as its relatively low user-friendliness in comparison to Excel on account of a limited extent of proliferation place limitations on the scope of its usage in other quantitative disciplines. Excel has therefore been the platform of choice as an instructional and/or computational tool in such courses that mandate number crunching and simultaneously require conceptual insights. Mathematics I & II in the first year, Statistics I & II in the second year, Project (in conjunction with MS Project software) and Financial Management in the third year, Financial Management Policy, Project Evaluation Analysis and Quantitative Methods for Decision Making in the fourth year incorporate (or have the potential to incorporate) Excel for analysis of management related problems. The versatility of Excel allows it to be used *inter alia* for mathematical computations, statistical analyses and modelling techniques and make it possible to work with real-world data in a class room environment instead of being restricted to idealised text book cases. To what extent the usage of such applications in the classroom bears an influence on the students' level of comprehension of the concepts in management and decision making situations being taught forms the topic of discussion of the sixth chapter that examines the role of a conceptual and strategically focused application such as Excel as an integrative technology in computer aided instruction (CAI). In contrast to computer

based learning (CBL) which essentially harnesses the prowess of ICT as a medium of knowledge exposition, CAI, in this context utilises the computational and analytical abilities afforded by ICT to fortify the quality and level of instruction in conceptual and strategic issues and thereby facilitates the teaching-learning process from the behavioural and analytical context. Whereas CBL tends to characterise automation and efficiency, CAI exemplifies transformation and effectiveness, in addition to mere automation and efficiency.

From the above discussion it is evident that the applications listed in the Generic/Strategic quadrant of Figure 4.1 have a crucial role to play in nurturing the prerequisite managerial competencies, which, *inter alia* include critical reasoning, problem solving capabilities and ability to make decisions under conditions of risk and uncertainty that are necessary, albeit not necessarily sufficient in sustaining and enhancing the phenomenal growth and dynamism experienced by the service sector in general and the tourism and hospitality industry in particular. Besides, as argued in Chapter 2, equipping tourism business management students with such skills and competencies allows them to explore opportunities in areas of the service sector other than tourism without having to restrict their careers to tourism related industries. These considerations lead towards designating the conceptual and strategically focused applications as being **'career critical'**. As illustrated in Figure 4.2, this aspect of ICT forms the critical backbone from the perspective of gathering and processing raw data into generating information and thereon analysing it for the purpose of deriving and creating knowledge and *ipso facto* merits further investigation, the outcome of which would bring potential benefit to the education and training aspects of the tourism sector, thereby narrowing the gap between skills imparted and competencies required.

Figure 4.2: ICT as Critical Backbone



4.4 Quo Vadis?

It was stated in Section 4.2 that the two principal foci of this thesis are the role of CAI as a pedagogic tool to facilitate the teaching-learning experience and the perceived relevance of topics that comprise the ICT syllabus incorporated into the curriculum. At this juncture, it is necessary to 'take stock' of the approach adopted thus far in this research and determine the grounds for its further evolution and direction towards meeting its stated objectives. In this chapter, the discussion and analysis on the ICT syllabus have been carried out in the localised context of IFT with reference to emerging global trends in the tourism sector at the macro level. The conclusions derived from such a localised study could be considered as having the potential for making a non-trivial contribution to the body of knowledge in this field if and only if their impact can have more universal micro-level ramifications i.e. applicability to institutions having goals and objectives similar to that of IFT.

The contextual background in which this research has been carried out has been elaborated in Chapter 1 wherein the significance of the tourism sector to the Asia Pacific region in general and Macao in particular as well as the role of IFT in meeting the human resource requirements in the tourism industry have been highlighted. The geographical, socio-cultural, political and economic diversity which characterises the Asia Pacific region precludes the degree of homogeneity that would have allowed for generic extrapolation of outcomes from one locale to another, thereby underlining a formidable constraint that is imposed by a strong contextual dependence. So as to dilute, if not totally eliminate this constraint with the objective of claiming a broader applicability of the outcomes of a research such as this, it is necessary to explore the commonalities and similarities in attributes that are relevant to the framework of the study. That precisely has been the *raison d' être* of Chapter 2 and Chapter 3.

The IFT's curricular structure has been analysed within the framework of the contextual backdrop provided in Chapter 1. Upon establishing the pre-eminence of the generic (non-core) disciplines over the specialised core courses and deducing the advantages that accrue from such a curricular structure from the perspective of nurturing managerial talent that could have scope within and without the industry, Chapter 2 has provided an insight into the breadth of focus of the curriculum with its attendant pros and cons. How such a curriculum compares with that of peer institutions in the regional framework has been addressed in Chapter 3 wherein curricula of the qualifying members of the APETIT network have been studied on the basis of a set of pre-defined criteria that has consequently established a degree of commonality between fifteen member institutions including IFT, with respect to the parameters laid out in these criteria. Thus, the extent of homogeneity instituted on the basis of these parameters considerably dilutes the hitherto

referred constraint imposed by a strong contextual dependence, thereby allowing for a reasonable extrapolation of the outcomes of such a study carried out in a localised context to other elements of this quasi-homogenous group, the intra-group diversity notwithstanding.

In the preceding sections of this chapter as well as sections 1.3 of Chapter 1, 2.2 and 2.3 of Chapter 2, the critical role of ICT in the growth and development of the tourism sector on the whole, with particular emphasis on the nurturing and education of management cadres has been underscored. ICT *per se* has multifaceted dimensions with each playing its role in making an individual contribution to the overall development of the industry to which it is applied. The emphasis of this research is to explore the advantages that accrue from the application of ICT to education in the field of tourism business management. From this juncture, the direction in which this research proceeds in based on evolving a two-pronged approach which attempts on one hand to gauge the impact of CAI (as integrated into a non-core course) on the students' performance in the given subject by virtue of a quasi-experimental investigation whilst on the other, offers an analysis of the topics that constitute the ICT syllabus from the perspective of their relevance as perceived by the stake-holders viz. students, faculty and industry practitioners (in their capacity as future employers). The situational perspective of this investigation has been illustrated in the form of a diagrammatic representation in Figure 4.3. The confluence of ICT, education, tourism and the geographical locale into this framework has provided a suitable platform for addressing a unique research direction that involves all the concerned areas simultaneously and hence the title of this section, on where this research is leading to. IFT has provided the necessary 'laboratory' environment for conducting this investigation, the outcome of which would provide insights to educators on the contribution of the discussed

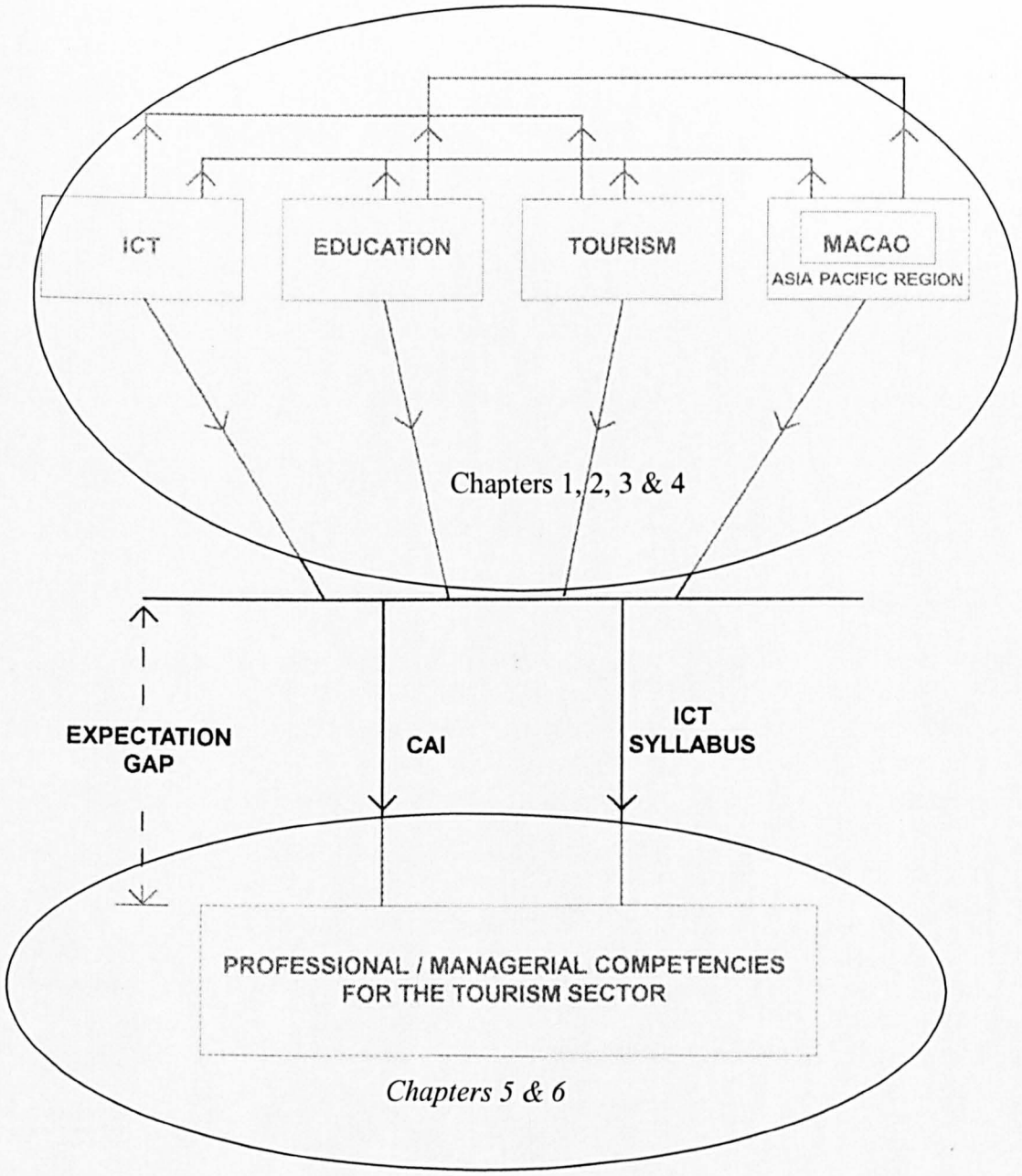
aspects of ICT in cultivating the prerequisite managerial competencies in tourism business management students and thereby recognise their potential to serve as a tool towards bridging the gap between what the industry expects and what the students learn during the course of their studies. Given the quasi-homogeneous group of APETIT members that has been defined on the basis of the comparison of the curricula carried out in the preceding chapter, the inferences drawn from this 'localised' study can, in the least, be extrapolated with a reasonably degree of confidence to the cases of other member-entities of this group.

4.5 Chapter Summary

This chapter has largely focussed on the significance of ICT in the tourism sector with emphasis on education. The factors that are possibly responsible for the gap between what is taught and what ought to be taught in consonance with the industry's requirement have been identified. The contents of ICT related courses in IFT have been analysed from the perspective of their operational and strategic utility based on which the ICT proficiencies required of tourism professionals and managers have been grouped into three broad categories, with one of these, the conceptual and strategically focused applications being established as 'career critical'. The role of such applications as a pedagogic tool in the form of CAI in a host of non-core management subjects has been discussed from the point of view of generating information from raw data and subsequently creating knowledge from the extracted information. In the concluding section of this chapter, the further direction of the thesis was defined as a consequence of 'taking stock' of the complement of

issues in tourism education and ICT that form the contents of the relevant sections of the preceding chapters as well as this one.

Figure 4.3: The Tao of Thesis



The 'stock taking' has thus led to evolving a cohesive framework and a working methodology that will serve as a platform for researching the primary foci of this thesis

which are studying the role of ICT in enhancing students' performance in management related disciplines and the evaluation of the ICT syllabus in terms of its perceived relevance in tourism management education. The subsequent chapters are devoted to addressing these issues.

CHAPTER 5 ICT IN TOURISM: STAKEHOLDERS' PERCEPTIONS

5.1 Chapter Introduction

In Chapter 4, the significance of ICT in tourism was underscored at a macro-level from the perspective of education and training requirements of the industry. There is a growing recognition of this aspect amongst educators in the tourism and hospitality sector globally, a fact that is substantiated by research emanating from geographically diverse regions. For instance, in the U.K., a study by Busby and Brunt (1997) has indicated that employers in the tourism industry expect university graduates wishing to make a career in the sector to possess management skills as well as ICT competencies. In the European context, the need for greater integration of ICT into tourism curricula was demonstrated by Swarbrooke (1995) based on his findings that ICT skills are crucial from the point of view of employment prospects whilst Cho and Conolly's (1999) research on the high tech requirements of the industry has focussed on the necessity for inclusion of ICT fundamentals in tourism education programmes in the United States. In the case of Hong Kong, Cheung and Law (2002) stress the need for hospitality and tourism graduates to be technologically competent in order to remain competitive in the global labour market.

The inferences derived from these studies carried out in different geographical locations and contexts leave little scope for doubt that the 'marriage' of ICT and tourism education is of benefit to the tourism sector as a whole. The question that merits further exploration is

how best this 'marriage can be consummated'. Identifying the needs of the industry as a whole in terms of the required ICT skills poses a challenging proposition, given the sheer diversity and complexity of the tourism and hospitality sector (Shepherd and Cooper, 1994). Such a challenge is not exclusive to the ICT syllabus alone but applies to other disciplines as well. Literature published in this field is replete with findings pointing towards the mismatch of what is taught and what requires to be taught in tourism and hospitality programmes. Attempts at identifying such gaps between curricula and industry needs have been made by Amoah and Baum (1997). An earlier study by Leslie (1991) ascertained that the actual fit between industry needs and educational and training provisions leave a lot to be desired. This inference is in concurrence with Ashley et al's (1995) findings that the demands of employers at the workplace are not in consonance with the education and training provided in tourism and hospitality management programmes. A survey conducted by Kivela and Li (1998) has identified ICT as one of the most significant among the thirty-four important management skills required by the industry whilst simultaneously revealing the lack of understanding of the industry's expectations on the part of educators imparting ICT and problem solving skills, the convergence of which has signified the shift in the focus of ICT as a mere support and utility tool for achieving efficiency to that of strategic enablement geared at attaining effectiveness. This confluence has resulted in the need for and recognition of integrating ICT into the various disciplines (both, core and non-core) included in the curricula of hospitality and tourism management programmes, thereby providing the scope for cross-functional utility and direct applications. The contextual diversity, the significance of which has been underscored at several junctures of this thesis, however, belies the possibility of evolving a standardised framework for the contents as well as pedagogic methodology of ICT syllabi in tourism

focused management programmes, the efforts of the World Tourism Organisation through its TEDQUAL programme (WTO, 1997) notwithstanding.

Consequently, though the tourism management programmes may share a common goal of cultivating among graduates '*a total enterprise approach with core competencies in problem solving, analytical abilities, IT application, literacy in office automation, and life long learning*' (Cho and Conolly, 1999; 40), the means of attaining this goal could be hostage to the contextual circumstances and *ipso facto*, diverse. Thus, the measure of effectiveness of the ICT syllabus within the bounds imposed by contextual constraints can be gauged uniquely, with a reasonable degree of confidence, by virtue of assimilation and analysis of inputs of the principal stakeholders of the tourism sector i.e. students, academic faculty and industry practitioners. Such an exercise would expose gaps, if any, between industry demand and education supply with respect to ICT enhanced management competencies and consequently yield locally applicable and yet globally relevant strategies that could play the role of a catalyst in facilitating an equilibrium between the aforementioned demand and supply. That is the objective of this chapter, the contents of which are the outcome of research carried out within the context of Macao and IFT.

5.2 Modus Operandi

As was pointed out in the preceding section, the diversity of the tourism sector poses a challenge in identifying the needs of the industry on a comprehensive basis. With specific

regard to ICT skills required in this sector, this challenge is further compounded by the sheer variety of software and hardware platforms available in the global markets, the choice of which is a composite function of their utility factor in terms of applications, availability of locational technical support and budgetary considerations pertaining to purchase price and maintenance costs. Thus, keeping in line with concurrent trends, even though the aspirations of educational institutions imparting tourism management programmes would be similar in terms of nurturing strategic and conceptual skills in their students through the effective application of ICT, the means by which these aspirations are achieved will vary in accordance to their contextual situation. As the exercise of comparing the curricula of APETIT member institutions in Chapter 3 has demonstrated, though subjects in non-industry related ICT applications did form part of their curricular structures, there was a distinct lack of homogeneity in their course contents. Thus, any attempt at determining the relevance of ICT competencies imparted to the students from the perspective of their career development will have to be studied in a localised context, the mechanism of which, however could have universal applicability.

The contents of the ICT syllabus in IFT were analysed in Section 4.3 of Chapter 4. Both, industry specific as well as generic applications were discussed. From the perspective of the development of ICT enabled managerial competencies aimed at achieving effectiveness, the applications listed in the first quadrant (labelled generic/strategic applications) of Figure 4.1 are of consequence whilst those finding mention in the fourth quadrant (labelled generic/operational applications) contribute towards attaining efficiency. As illustrated in Table 5.1, most of these applications/concepts are taught in dedicated ICT courses in the first, second and third years of study at IFT for both hotel and tourism streams. Subject specific software such as Daceasy and SPSS are however excluded from

dedicated ICT courses and are taught as part of the syllabi in accounting and marketing courses respectively. A general exposure to strategic application packages such as Excel and Project is provided in the dedicated modules though specific functions and utilities in these applications are taught in the relevant subject areas. As the dedicated ICT courses are classified as being generic (non-core), there is no difference in the course contents between the two streams (i.e. hotel and tourism).

Table 5.1 Dedicated ICT courses in the IFT curriculum

	First Semester	**Second Semester**
Year 1	Introduction to Computers 1	Introduction to Computers 2
Year 2	Computer Applications 1	Computer Applications 2
Year 3	Information System Management 1	Information System Management 2

In order to determine to what extent the generic applications are relevant from the students' perspective, both as catalysts in the educational process as well as facilitators in their career development, it is essential to gauge inputs from the principal stakeholders in the industry who are:

- **Students:** These are cadres in the making who are on the verge of entering the industry (third year students from both streams, hotel and tourism) or are in the nascent phases of their careers (fourth year students who work during the daytime and attend classes during off office hours) at IFT. Gauging their perceptions on the utility of the ICT topics included in the syllabus either by virtue of independent modules or integration into other subjects from the perspective of learning as well as career development will provide a valuable input in evaluating the relevance of the ICT course contents.

- **Educators**: These are the IFT academic faculty who are providers and/or facilitators of knowledge and are partly if not wholly responsible for ensuring that the skills taught in their respective disciplines are commensurate with the changing demands of the industry. The level of significance they attach to ICT as a teaching tool to facilitate the learning process not only in terms of automation and efficiency but also transformation and effectiveness will be influenced by their individual perceptions of ICT applications in relation to their areas of specialisation.

- **Industry Practitioners:** These are potential employers at the decision making level in hospitality and tourism businesses in Macao who are best suited to opine on the managerial skills and competencies required of future recruits in the industry. Their inputs would significantly contribute towards better understanding of the contemporary trends and challenges in the hospitality and tourism sector and their repercussions on the local industry which have been brought about on a global scale in the wake of the ICT revolution as also their own comfort level in interfacing with ICT along with the attendant influence it may bear on their expectations vis-à-vis future recruits.

As illustrated in Figure 5.1, survey and interview tools were applied to gauge the stakeholder inputs in terms of IFT students' perceptions, academic staff opinions and Macao tourism industry practitioners' judgments on the relevance of the following ICT competencies:

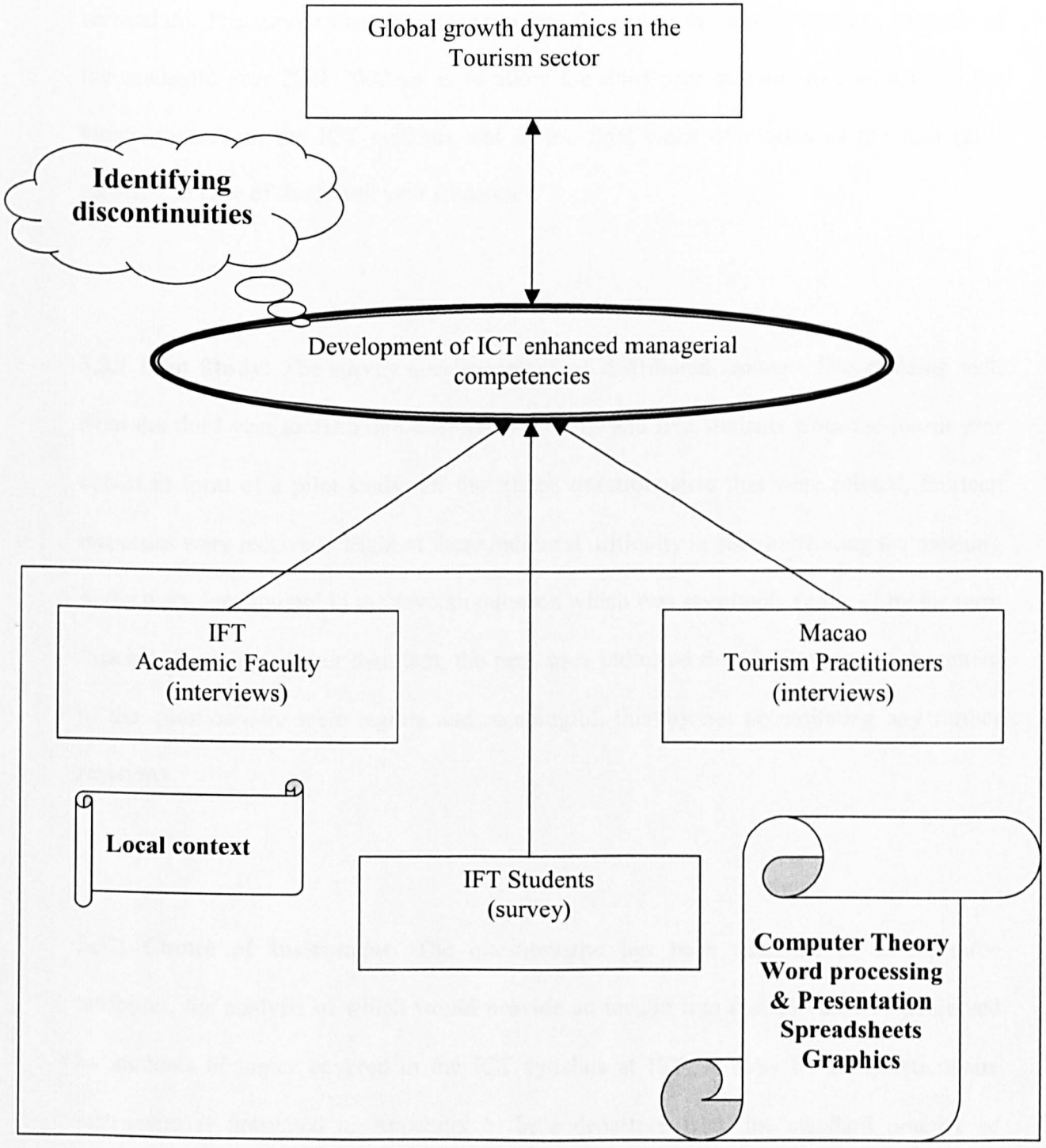
1. Computer Theory
2. Word processing and presentation
3. Spreadsheets
4. Graphics, multimedia & desktop publications
5. Databases
6. Internet & e-mail

The collective analyses of these inputs will contribute towards determining the extent to which ICT plays a role in nurturing the relevant managerial competencies that provide the driving force for a sustainable growth in the tourism sector. It needs to be emphasised that though the outcome of such analyses emanates from the contextual boundaries of local nuances, the common attributes that characterise the skills and competencies requirements of the tourism sector globally are brought into focus. The application of the research instruments, outcome and analyses of the stakeholder inputs are presented in the following sections.

5.3 Students' Perceptions

The students' perceptions on the relevance of the contents of the ICT syllabus were gauged by virtue of a survey assessing three attributes namely, application and usage in other courses included in the curriculum, the level of instruction and the perceived potential of the application/concept in career development. Only those students having studied through all the dedicated ICT modules (as listed in Table 5.1) could be deemed competent in offering opinion on all the generic applications included in the syllabus.

Figure 5.1: Stakeholder inputs towards sustaining growth



Thus, students in their first and second years of study were ineligible to participate in the survey by virtue of not having taken all the dedicated ICT courses included in the curriculum. The survey was conducted towards the end of the second (spring) semester of the academic year 2001-2002 so as to allow the third year students to complete all the topics covered in the ICT syllabus and in the final week of classes of the first (fall) semester in case of the fourth year students.

5.3.1 Pilot Study: The survey questionnaire was distributed amongst five students each from the third year tourism and hospitality streams and five students from the fourth year cohort in form of a pilot study. Of the fifteen questionnaires that were piloted, fourteen responses were received. Eight of these indicated difficulty in comprehending the meaning of the word 'pedagogic' in the seventh question which was eventually replaced by the term 'teaching/learning'. Other than that, the responses indicated that the structure and content of the questionnaire were legible and meaningful, thereby not necessitating any further revisions.

5.3.2 Choice of Instrument: The questionnaire has been designed to assess three attributes, the analysis of which would provide an insight into the relevance as perceived by students of topics covered in the ICT syllabus at IFT. A copy of the questionnaire instrument is presented in Appendix 5. In a departure from the standard practice of applying the Likert scale to measure such attributes, a binary multiple mention code was adopted. Such a departure was mandated so as to avoid a longitudinal warp in responses

from the respondents, who are in their third and fourth years of study wherein they would be required to comment on applications and concepts that were taught throughout the course of their study since their enrolment into the programme at least three years back. To require the respondents to make a selection on an ordinal scale of the Likert type would therefore increase the chances of eliciting distorted responses as the tendency would be towards according greater importance to applications that were more recently taught or in concurrent use. A binary code of the 'yes or no' type on the other hand, would reduce such an anomaly. Also, given the wide range of software included in the syllabus and the variations in the scope of their applicability, a binary response mechanism to gauge the respondents' perceptions on their usage and applications would be more accurate in comparison to a Likert scale design. To cite an instance, the usage of a word processing application such as Word is far more extensive across the disciplines in comparison to say, a spreadsheet application like Excel which finds a fairly limited usage, primarily in quantitative subjects. Thus, the bias in favour of one application over another would be more pronounced if a Likert type scale were to be applied. Taking into consideration these aspects of measurement, the binary design was opted for.

5.3.3 Questionnaire structure

The questionnaire comprised eight items, with the first six having a similar structure wherein each question corresponding to each of the six ICT competencies was trifurcated into three sub-items in order to assess:

i) application and usage in other courses included in the curriculum

ii) level of instruction for the concept taught in the dedicated ICT courses

iii) potential value of the application/concept in career development

The students were not required to disclose their identity; however, for the purpose of further analyses they were asked to indicate their year of study and stream (where applicable). The seventh question in the survey was formulated with the aim of assessing whether ICT, when applied to a subject as a pedagogic tool has a benign effect on the students' motivation in learning that subject. The generic applications included in the ICT syllabus at IFT are by no means exhaustive. The last question in the survey was of the open ended type and was included with the intention of eliciting opinions from students on what applications they deem as being important are presently absent from the ICT syllabus. An elaboration of the trifurcated sub-question structure adopted in questions one to six in the survey ensues.

a) Application and usage: For each of the six ICT skills and concepts listed in the preceding section, respondents were asked to adjudicate on whether the given application found usage in other areas of discipline that were grouped in accordance with the procedure described in Section3.2 of Chapter 3. Table 5.2 lists these discipline areas including the core courses and practical training subjects that collectively form the IFT curriculum. Respondents could select more than one subject areas in which the given application was found to have usage.

Table 5.2 Subject areas in the IFT curriculum

Core courses (Tourism- or hotel-related subjects)
Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organisational Behaviour, etc.)

b) Level of Instruction: The respondents were required to select one of the three options that best represented their evaluation of the level of course contents for each of the six skills/concepts taught in the dedicated ICT courses. The options provided were:

- Too basic
- Just about right
- Extensive

More extensive documentation on the appraisal of the course contents in the form of the mandatory course evaluation forms completed by students at the end of each semester was accessible through the IFT Registry. However, as the contents for a given course could

include more than one ICT skills and/or concepts the evaluation would not reflect on individual ICT skill *per se* but on the course as a whole. Besides, as the evaluation forms were required to be filled in at the end of each semester, the students' perception on the utility of the ICT skills taught for that semester would be restricted to the subjects they have studied to that particular point in time and not the entire curriculum. On account of these factors, the data from the course evaluation forms could not be included in the analysis, thereby necessitating the inclusion of this sub-item in the survey for assessing the level of instruction of the given ICT skill.

c) Potential in career development: As the respondents were in their third and fourth years of study, they have had an exposure to the work environment and expectations in the industry as part of the mandatory summer internships at the end of the first and second years of study as well as by virtue of core and practicum oriented courses. On the basis of this exposure, students were asked to opine on whether a given application had the potential to make a significant contribution towards their future career development. The fourth year students were in a slightly more advantaged position in making such a judgement in comparison to their third year counterparts as they had already commenced on their career path, working during the office hours and studying in the evenings.

5.3.4 Respondent profile

The profile of the target respondents is provided in Table 5.3. The batch code is designated in accordance with the intake codes assigned in Section 6.2 of Chapter 6. The survey was conducted in the last week of classes of the spring semester of the academic year 2001-

2002 in the case of the third year students. Of the nineteen questionnaires handed out to the third year hotel management students, seventeen responses were received as two students were absent in the class during which the survey was conducted. The corresponding figure for the third year tourism management students was twelve, a response rate of cent percent. The original S-98 batch consisted of thirty-seven students. However, in the first semester of the academic year 2001-2002 in which the survey was conducted among the fourth year students, three students from the preceding batch S-97 who had failed to graduate the final year of study were also included in the fourth year cohort, taking the total class size to forty. As these repeat students had also studied the same syllabus in ICT subjects albeit a year ahead of their concurrent contemporaries, their inclusion in the survey was not deemed as a source of contamination of the data.

Table 5.3 Target respondent profile

Major & Year	Batch code	Batch size	Responses
Year 3 Hotel Management	BH(99)	19	17
Year 3 Tourism Management	BT(99)	12	12
Year 4 Tourism Business Management	S-98	37	40*
Total	S98 + S99	68	69

* Original batch of 37 students plus 3 repeat students

After soliciting due consent from the lecturer in ICT subjects, the survey among the third year students was carried out (distribution and collection) during the last but one lecture of the semester in Information System Management 2 whilst in the case of the fourth year students, the questionnaires were distributed and collected during the last lecture in Quantitative Methods for Decision Making, a subject taught by the investigator in the fall semester of the academic year 2001-2002.

5.3.5 Outcome and analysis of responses

The raw data from the questionnaires were entered into SPSS version 10 for further analysis. In the interest of brevity in presentation of the outcome in Table 5.5, the six ICT competencies/concepts taught in the dedicated ICT courses have been coded and tabulated in Table 5.4.

Table 5.4 List of applications/concepts

Code	Application/Concept	Type
CT	Computer theory	Theoretical foundations
WP	Word and Power Point	Word processor & presentation tool
XL	Excel	Spreadsheet
GR	Pagemaker/ Viso/ Photo Editor	Graphics and desktop publishing
DB	Access	Database management system
EM	e-mail/ Internet	Communications and data search

The outcome of the responses to the set of six sub-questions soliciting students' feedback on the application and utility of these six ICT competencies in other discipline areas of the curriculum is presented in Table 5.5. The six ICT competencies/concepts have been arranged in columns whilst the subject areas have been aligned into rows. As the respondents were allowed to choose more than one subject area in which they judged a given ICT competency to be applicable, the data set is not mutually exclusive. As a result, though percentages and frequencies can be tabulated, the row and column totals exceed the number of respondents (with the corresponding percentage totals being in excess of 100%). Such a design, the reasons for adoption of which were stated in Section 5.3.2 precludes the possibility of performing any meaningful statistical significance tests to study group

differences and thereby restricts the analysis to comparison of frequencies and percentages (Oppenheim, 1992).

As can be seen from Table 5.5, the applications that find the maximum usage across the curriculum are, not surprisingly, Word and Power Point and Internet and e-mail, both being of the Generic/Operational type vide Figure 4.1. In case of the former, it finds extensive usage in preparation of class assignments, projects and reports whilst the later serves as a source of information and communication, especially in situations that demand submission of assignments and projects through electronic format, therefore implying that these applications are ideally suited for computer based learning (CBL) which purports to harness the prowess of ICT as a medium of knowledge exposition and information interchange.

On the other hand, graphics and desktop publishing, database management systems and computer theory in that order were perceived to have a relatively low utility value in terms of application in other subject areas. The utility of Excel, categorised as a conceptual and strategically focused application of the generic type, which incidentally ranked second in the overall column totals that signify usage across the disciplines constituting the curriculum, was found to be particularly strong in quantitative/numerical subjects that comprise group D and group E (except dedicated ICT subjects) apropos Table 3.1. In fact, a little over a third of the respondents opined that the application was found to be useful in subjects such as quantitative methods, mathematics and statistics.

As was discussed in Chapter 4, the emphasis of this research is towards exploring the role of ICT in fostering managerial competencies in budding tourism professionals, thereby

placing the spotlight on conceptual and strategically focused applications represented in the first quadrant of Figure 4.1. Apropos the frequency distribution in Table 5.5, from this family of applications, Excel, in the perception of the respondents, is found to have the highest utility value in terms of being applied as a tool in other discipline areas, thereby making it eminently qualified for being considered as an integrative technology in computer aided instruction (CAI) in accordance with the arguments presented in Section 4.3 of Chapter 4.

The results of the students' perceptions on the overall level of the course contents which included the six generic ICT competencies and concepts are summarised in Table 5.6. The overall gist of the responses tends to indicate that the level at which the course contents are taught ranges from being just about right to too basic. There is no perceptible trend observed that differentiates the generic operational concepts from their conceptual and strategic counterparts with respect to the level at which they were taught. It needs to be noted however, that for all the six ICT concepts, the number of respondents concurring with the option that the level at which the course contents were taught was extensive, is negligible. This outcome is consistent with the observation made in Section 4.3 of Chapter 4 that the spur in the penetration of ICT at the pre-university level in recent years has been steadily making the students more ICT savvy in so far as end-user applications are concerned. The outcome of this aspect of the study, in terms of gauging students' perceptions on the level of the course contents taught in the dedicated ICT modules can contribute towards augmenting the overall quality of the ICT syllabus.

Table 5.5 Students' perception on utility of ICT applications in other disciplines

Discipline	ICT competencies*						
	CT	WP	XL	GR	DB	EM	**Total**
Core courses (Tourism- or hotel-related subjects)	40 (57.97%)	54 (78.26%)	31 (44.93%)	27 (39.13%)	32 (46.38%)	53 (76.81%)	**237 (343.4%)**
Business Operations & Functions (Marketing, Consumer Behaviour, Quality Management, etc.)	20 (28.99%)	51 (73.91%)	31 (44.93%)	22 (31.88%)	29 (42.03%)	42 (60.87%)	**195 (282.6%)**
Practical courses (Internships, hands-on practice in training units, IFTI)	28 (40.58%)	44 (63.77%)	22 (31.88%)	24 (34.78%)	23 (33.33%)	43 (62.32%)	**184 (266.6%)**
Quantitative courses (Quantitative Methods, Mathematics, Statistics)	34 (49.28%)	39 (56.52%)	52 (75.36%)	13 (18.84%)	24 (34.78%)	37 (53.62%)	**199 (288.4%)**
Finance & Economics (Accounting, Economics, Financial Management)	19 (27.54%)	33 (47.83%)	47 (68.12%)	8 (11.59%)	18 (26.09%)	34 (49.28%)	**159 (230.5%)**
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations)	10 (14.49%)	35 (50.72%)	4 (05.80%)	15 (21.74%)	8 (11.59%)	45 (65.22%)	**117 (169.6%)**
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organisational Behaviour)	23 (33.33%)	45 (65.22%)	20 (28.99%)	22 (31.88%)	26 (37.68%)	47 (68.12%)	**183 (265.2%)**
Total	**174 (252.2%)**	**301 (436.2%)**	**207 (300%)**	**131 (189.8%)**	**160 (231.9%)**	**301 (436.2%)**	

* Key to the abbreviations is provided in Table 5.4

Table 5.7 sums up the students' responses vis-à-vis their assessment on the prospective contribution the knowledge of a given ICT skill/ competency can bring towards their future career enhancement. The ICT skill/ competencies have been ranked on the basis of affirmative responses in terms of their career enhancing potential. As is evident from the tabulated data, Excel 'shares the honours' with Word & Power Point in topping the tally.

Table 5.6 Students' perceptions on level of teaching of ICT competencies

Content & Level	Frequency	Percent	Cumulative %
Computer Theory			
Missing cases	1	1.4	1.4
Too basic	22	31.9	33.3
Just about right	38	55.1	88.4
Extensive	8	11.6	100.0
Total	69	100.0	
Word processing and presentation			
Too basic	26	37.7	37.7
Just about right	42	60.9	98.6
Extensive	1	1.4	100.0
Total	69	100.0	
Spreadsheets			
Too basic	31	44.9	44.9
Just about right	34	49.3	94.2
Extensive	4	5.8	100.0
Total	69	100.0	
Graphics & DTP			
Missing cases	5	7.2	7.2
Too basic	35	50.7	58.0
Just about right	25	36.2	94.2
Extensive	4	5.8	100.0
Total	69	100.0	
Database & Project			
Too basic	25	36.2	36.2
Just about right	38	55.1	91.3
Extensive	6	8.7	100.0
Total	69	100.0	
e-mail/Internet			
Too basic	33	47.8	47.8
Just about right	33	47.8	95.7
Extensive	3	4.3	100.0
Total	69	100.0	

That knowledge of a word processing and presentation application should be deemed as being important is more or less obvious but the fact that Excel is also accorded such a level of significance in terms of its potential in career development reflects on the level of awareness of this application's role as an indispensable tool in managerial decision making on part of the respondents. Graphics and desktop publishing applications on the other hand polled the least number of affirmative responses on this count.

As the figures summarised in Table 5.8 indicate, circa eighty percent of the respondents concurred that the application of ICT as a pedagogic tool in form of CBL or CAI augments their motivation for learning the given subject. This question was the only item in the survey that sought to gauge an attribute not directly related to the ICT syllabus as taught in the dedicated modules.

The final question in the survey was of the open-end type, inviting the respondents to suggest applications and concepts in ICT that they thought were of value but were not presently included in the syllabus. A total of sixteen respondents offered their opinions which exhibited a fair level of diversity. Save one, none of the sixteen respondents provided more than one suggestion. Four of the respondents lamented the lack of e-commerce topics (B2B & B2C transactions, e-banking, m-commerce, POS) in the current ICT syllabus whilst one of these stressed the importance of relating these technology concepts to the hospitality and tourism industry. Three respondents recommended upgrading the overall level of the ICT syllabus. These remarks are in consonance with the findings on the students' perceptions on the level at which ICT skills/competencies are taught.

Table 5.7 Students' perceptions on the potential utility of ICT competencies in future career development

Content & Level	Frequency	Percent	Rank*
Computer Theory			3
Yes	47	68.1	
No	9	13.0	
Can't say	13	18.8	
Total	69	100.0	
Word processing and presentation			1
Yes	61	88.4	
No	2	2.9	
Can't say	6	8.7	
Total	69	100.0	
Spreadsheets			1
Yes	61	88.4	
Can't say	8	11.6	
Total	69	100.0	
Graphics & DTP			4
Missing cases	3	4.3	
Yes	40	58.0	
No	14	20.3	
Can't say	12	17.4	
Total	69	100.0	
Database & Project			3
Missing cases	1	1.4	
Yes	47	68.1	
No	9	13.0	
Can't say	12	17.4	
Total	69	100.0	
e-mail/Internet			2
Missing cases	2	2.9	
Yes	59	85.5	
No	4	5.8	
Can't say	4	5.8	
Total	69	100.0	

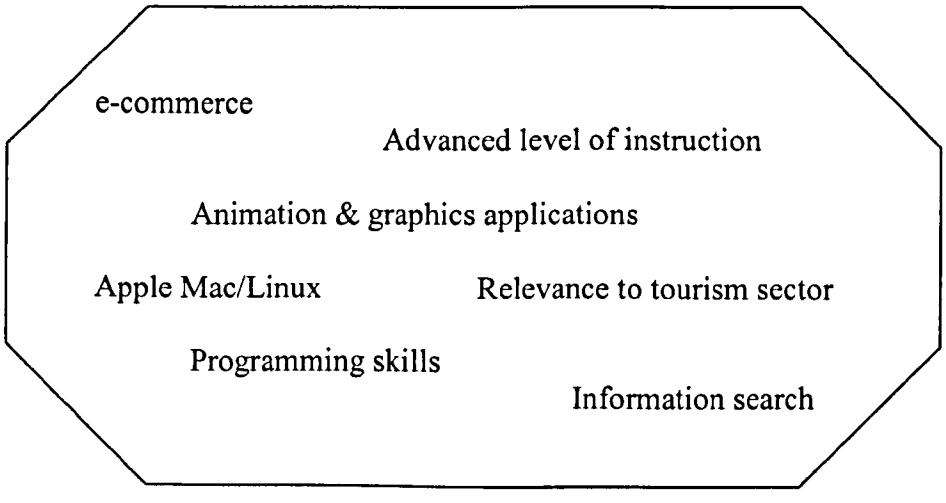
* Based on affirmative response

Table 5.8 ICT as a motivator for learning

Response	Frequency	Percent
Missing cases	2	2.9
Yes	55	79.7
No	6	8.7
Can't say	6	8.7
Total	69	100.0

Another three respondents suggested devoting more time to teaching graphic applications. Two of the respondents stressed on the need to be familiarised with alternate platforms such as Apple Macintosh and Linux. A couple of suggestions were accented on placing more emphasis in the ICT syllabus on information search, access and retrieval techniques. There was one response each recommending the incorporation of topics in animation software such as Flash in Website design and computer programming languages such as Java and C++ in the ICT syllabus. Figure 5.2 encapsulates a synopsis of the recommendations received from the students in the form of their responses to the open-ended question.

Figure 5.2: Lacunae in existing ICT syllabus as perceived by students



It is noteworthy that three of the respondents suggested according a deeper focus to the teaching of graphical and desktop publishing applications, given their relatively low degree of importance in the rankings for their potential in career development as well as utility value in other subjects. This seemingly contradictory situation could be correlated with a fair majority (little over half) of the students' perception that the level of the course content for these applications is too basic. Excel, on the other hand which has enjoyed a substantially wider exposure in terms of being used as an integrated tool in the teaching of some of the quantitative subjects, is perceived to be of significance insofar as career development is concerned, by eighty eight percent of the respondents though circa forty-five percent of them feel that the level at which it is taught in the dedicated ICT courses is too basic. Thus, the analysis of this survey has brought into focus the possible causality between exposure and perceived relevance of a given ICT competency. From a theoretical perspective, these findings are in agreement with the concept of meaningfulness as defined in the minimalist theory propounded by Carroll (1998) which states that ICT tasks and exercises should be self-contained and meaningful to the learners and Knowles's (1975; 1984) andragogy theory which postulates that interest in (and thereby, the capacity to learn more effectively) a given ICT skill varies in direct proportion to its immediate relevance. The following section explores the perceptions of the academic staff at IFT on the utility of ICT in the pedagogic process.

5.4 Faculty Perceptions

As facilitators of knowledge and imparters of skills, the academic faculty provide the students with the 'survival tools' necessary to 'perform' in the profession. As Yarusso (1992) has pointed out, instructors structure reality into abstract or generalised representations that can be disseminated to the students who in turn can recall and apply the same in a professional situation. Recent advances in ICT have provided further diversity and flexibility to the host of pedagogic techniques and methodologies available to the instructor in delivering on his/her mission (Nadkarni, 1998). With specific reference to management education, Leidner and Jarvenpaa (1995) conclude that ICT 'can enable the effective application of constructive, cognitive, collaborative and socio-cultural models of learning'. Opinions on the extent of ICT's utility in the pedagogic process as well as its contribution to the students' 'survival tool kit' are bound to be influenced, *inter alia*, by the instructor's adaptability in interfacing with ICT and hence varied. As one of the three principal stakeholders in Macao's tourism industry from the perspective of grooming management cadres, it is of significance to record the IFT faculty's perceptions on the role of ICT and cross compare the opinions with the other two stakeholders, namely students and industry practitioners.

5.4.1 Target Group

The distinction between core and non-core courses was underscored in Chapter 2 whilst a differentiation of ICT applications along core and non-core orientations was made in

Chapter 4 with the aim of bring into focus the principal issue of the role of ICT in the development of generic management competencies in students specialising in tourism business management. In line with the arguments advanced in these preceding chapters, the core subjects tend to be primarily operational in nature wherein the role of ICT, if any, is largely confined to achieving operational efficiency (as against effectiveness). On these grounds, it would be reasonable to assume that the opinion of faculty members involved solely in imparting core industry specific operational skills would have a minimal impact on the assessment of the role of ICT by virtue of generic applications. Hence, within the scope of this study, the target group whose perceptions are of relevance are the faculty members teaching generic (non-core) subjects, common to both the streams, hotel and tourism.

Table 5.9 Full time Faculty at IFT

Lecturer	Discipline
Bandeira, Hugo Robarts	Hotel Management
Chan, Soi Ha Shirley	*Accounting and Finance*
Dioko, Leonardo Anthony	*Marketing and Management*
Ieong, Fong Im Jaci	*Computer Applications and MIS*
Inoue, Kenichi	Japanese
Ip, Ka I Doris	English
Iu, Ka Ming Nacky	Hotel Management
McCartney, Glenn	*Public Relations* and Hotel Marketing
Moreira, Pedro	*Management and Social Sciences*
Nadkarni, Sanjay	*Quantitative Methods*
Ogle, Alfred	Hotel Management
O'Mullan, Kok Kum	English
Vong, Tze Ngai Louis	*Management*
Wong, Im Kun William	Tourism

Source: IFT Website http://www.ift.edu.mo/academic.htm

In Section 1.6 of Chapter 1, it was pointed out that the strength of the full time academic faculty at IFT since its inception has been very modest, varying between nine and thirteen, on account of the moderate number of students enrolled in accordance with regulatory guidelines whilst the part-time or adjunct and visiting faculty who largely comprise of professionals practising in different sectors of the economy have hovered in the range of circa thirty per semester. Table 5.9 represents the full-time faculty list as of the academic year 2002-2003, inclusive of the disciplines they teach. Apropos the arguments advanced in Section 2.4 of Chapter 2, core and language subjects are excluded from the scope of this research. Thus, the target group is confined to the full time academic staff members at IFT teaching non-core subjects associated with the development of strategic and conceptual managerial competencies. These are highlighted in *italics* in Table 5.9. The researcher being one of the seven faculty members that comprise the target group, the number of members of this group available for interviews is reduced to six.

5.4.2 Instrument & Interview Structure

Drawing upon Youngman et al's (1978) articulation on the choice of an appropriate research tool for eliciting specific information from a small group of respondents, a semi-structured interview was considered suitable for this aspect of the study. A purely structured interview would be no different from administering a questionnaire thereby risking a potential loss of recording more profound insights on part of the respondents, which, given their relatively small numbers would have an adverse impact on the study while an unstructured approach would make staying focussed on the issues of relevance an

inordinately difficult proposition. Hence, the semi-structured approach, which makes an allowance for probes and open ended questions. The choice of this instrument was arrived at after according due consideration to its attendant shortcomings in terms of potential interviewer bias as pointed out by Sellitiz et al (1962) and Boyd and Westman (1970). Bill (1973) emphasises that the success of an interview depends largely on the level of openness on a one-to-one basis. The collegial context in which this instrument was applied facilitated such openness. A sample of the interview questions' sequencing and structure is available in Appendix 6, wherein in the interest of brevity, the spacing provided for recording the answers has been condensed.

The interview comprised of a total of nine questions. The interviewee profile including the name, subjects taught (classified apropos Table 3.1), date and place of interview were recorded on the cover sheet. The first and second questions enquired of the respondents' usage of ICT in their pedagogy, more specifically, in preparation, delivery and assessment of their courses. In the third question, interviewees were asked to rate themselves on an ascending scale of four on their proficiency in the usage of generic applications drawn from the first and fourth quadrants of Figure 4.1. The mechanism of self-ranking exposes itself to limitations associated with the 'you don't know what you don't know' conundrum. However, in absence of alternate standardised procedures to assess applications user-skills on part of the respondents, the self-ranking mechanism was applied. A four category classification (low, medium low, medium high and high) was adopted to accommodate variations in interviewee responses pertaining to their self-assessment on their proficiency levels in interfacing with the listed applications, which at the analysis stage was collapsed into a dichotomous classification (high versus low). Cue cards listing the scale and list of applications were used in order to facilitate interviewee responses at the time of the

interviews. The fourth question probed into the specifics of functions and tools in the application/s that the interviewees used which were of particular significance to them. These four questions were designed to solicit information pertaining to the faculty members' scope of usage of ICT in the practice of their pedagogy and the level of their perceived proficiency in the application of a host of generic ICT skills and concepts

The fifth and sixth questions were aimed at gauging the faculty opinion on the relevance of ICT in developing managerial competencies in the students. The question structure made an allowance to the respondents to elaborate and justify their views on the necessity on the part of the students to be proficient in ICT applications in order to become successful managers. In order to minimise the scope for bias, given the investigator's views in favour of conceptual applications, the concepts and applications on which the respondents were invited to offer their opinion in terms of their role in nurturing managerial competencies were not subjected to segregation on the grounds of operational and strategic significance. The seventh question offered the respondents an opportunity to state whether they preferred students to be conversant with any application/s other than those listed on the cue card (Appendix 7), which could specifically be related to their subjects. The penultimate question was targeted at the interviewees to solicit their opinion on the role of ICT as a facilitator in the teaching learning process. In the final question, interviewees were invited to opine on the comprehensiveness of the interview instrument with respect to the role of ICT in grooming management skills among the students. This question was included with the intention of generating a 'snowball' effect that would provide for an added dimension of richness to the interviews.

5.4.3 Interview Methodology

In lieu of a pilot interview on any of the target group members, given its small size as was elaborated in Section 5.4.1, the list of interview questions was referred to Ms. O'Mullan, Kok Kum, who lectures in English language studies at IFT for comments on clarity of the language. Upon her suggestion, in the interest of clarity, the eighth question, which was originally drafted as "Would you consider ICT as a catalyst in facilitating the pedagogic process?" was subsequently rephrased as "Do you think that ICT facilitates the teaching/learning process?". No other changes were deemed necessary.

The faculty members who comprised the target group were approached in person by the researcher during the third week of October 2002, with a request for an appointment for interviews. The purpose and scope were clearly spelt out at the time of soliciting appointments. Being in the same collegial fraternity, no glitches were encountered in obtaining consent to interview from all the target group members and all the interviews were scheduled for the following week, as shown in Table 5.10. The interviewees were requested to set aside thirty minutes for the interview.

All the interviews were conducted on campus and on schedule with the interview time varying between fifteen minutes to half an hour. In the case of Ms. Jaci Ieong, who lectures in ICT subjects, the first four questions were not applicable, thereby requiring a total interview time of a little over fifteen minutes. As was mentioned in the preceding subsection, cue cards were used at appropriate junctures during the interviews. The replies were jotted down concurrently on a pre-designed interview sheet (Appendix 6). The replies were transcribed to a duplicate interview sheet within one hour of completion of each

interview. The duplicate sheet was forwarded to each interviewee for verification purposes, all of whom agreed to being quoted as and where necessary. As no discrepancies were noted, the transcribed interview sheets were subjected to analysis, the results of which are presented in the following subsection.

5.4.4 Outcome

All the five non-core discipline areas classified in accordance with the arguments forwarded in Section 3.2 of Chapter 3 were represented with two faculty members belonging to Group C and one each for the others. Table 5.10 profiles the interviewees according to the five discipline groups they teach. In the interest of brevity, respondent initials which have been assigned against their names in the first column of Table 5.10 will be used in the ensuing analysis of the interviews.

Table 5.10 Faculty Interviewee Profile: Disciplines & Schedules

Interviewee	Discipline (Group)	Interview Date
Chan, Soi Ha Shirley (SC)	Finance & Economics (D)	*22 October 2002*
Dioko, Leonardo Anthony (LD)	Business Operations & Functions (C)	*21 October 2002*
Ieong, Fong Im Jaci (JI)	Quantitative subjects & IT (E)	**24 October 2002**
McCartney, Glenn (GM)	Business Operations & Functions (C)	*22 October 2002*
Moreira, Pedro (PM)	Social Studies (A)	*21 October 2002*
Vong, Tze Ngai Louis (LV)	Organisation Theory (B)	*25 October 2002*

It was a fortunate coincidence that the profile of the full time faculty at IFT allowed for each of the five discipline groups to be covered in the study, thereby epitomising a fairly

representative set of opinions stretching across the entire spectrum of the non-core curriculum.

5.4.4.1 *Faculty Usage and Proficiency*

The responses to the interview questions pertaining to the faculty's usage of ICT in pedagogy and their self-assessed level of proficiency in generic applications and concepts are summarised in Table 5.11. The ICT applications and concepts have been grouped in columns and labelled in accordance with Table 5.4 whereas the interviewees are profiled in rows. As explained in the previous subsection, JI, by virtue of being a lecturer in ICT subjects, was precluded from responding to the interview questions pertaining to the ICT interface profile of the faculty members. The four category scale devised to accommodate variations in the interviewees' self-assessment of their ICT proficiency can, for the purpose of analysis, be collapsed into a dichotomous attribute viz. high proficiency and low proficiency. The strength of the relationship between high proficiency and usage in pedagogy is evident from the tabulated outcome. *Prima facie*, this statement seems to state the obvious in that proficiency in a given application on part of the user will allow for its usage in the user's professional activities. However, the incentive to gain proficiency in a particular application or concept which could involve substantial investment in time and effort, is largely derived from the recognition of its prospective utility in the discharge of functions on part of the potential user. To cite an instance, the concept of documentation and presentation of pedagogic material has been an integral part of the teaching fraternity much before the advent of computers.

Table 5.11 ICT Interface Profile of Faculty

Code	CT		WP		XL		GR		DB		EM		OT	
	SP	*UP*	*SP*	*UP*	*SP*	*UP*	*SP*	*UP*	*SP*	*UP*	*SP*	*UP*	*SP*	*UP*
SC	L	N	H	Y	H	Y	ML	N	ML	N	MH	Y	MH*	Y*
LD	MH	Y	H	Y	ML	N	ML	Y	L	N	MH	Y	H#	N#
JI	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GM	L	N	H	Y	ML	N	L	N	L	N	H	Y	-	-
PM	H	Y	H	Y	MH	Y	MH	Y	L	N	MH	Y	MH#	Y#
LV	L	N	MH	Y	ML	Y	L	N	L	N	MH	Y	MH#	N#

Key to Table 5.11

SP	Self assessed proficiency
L	Low level of proficiency
ML	Medium low level of proficiency
MH	Medium high level of proficiency
H	High level of proficiency
UP	Utility in pedagogy
Y	Applied in pedagogy
N	Not applied in pedagogy
-	No response
*	Dac Easy
#	SPSS

Usage of ICT in this functional aspect in the form of Word and Power Point has greatly automated routine tasks and thereby induced efficiency across all the disciplines. The same argument applies in the case of information search and dissemination which have been immensely facilitated by the Internet and e-mail. That explains the high level of proficiency each of the interviewees has attributed to himself/herself in applications such as WP and EM as well as their usage in the practice of their pedagogic functions. In particular, the functions and tools in these applications that stood out for special mention were the thesaurus, animation effects, formatting and manipulating the layout and search engines for secondary data search.

Also, it is of consequence to note the type of applications that find favour with faculty members apropos the subject areas they teach in. Specialised software such as SPSS in which LD, PM and LV have indicated their familiarity by virtue of their background in social sciences and business subjects like marketing does not find a mention among the other respondents on account of its low potential utility in the subjects they teach. It is interesting to note, however, that high level of proficiency does not necessarily imply usage in pedagogic practice as is borne out by LD and LV's responses in relation to SPSS.

It is also worthwhile taking note of the fact that all the interviewees, even those teaching subjects like marketing and accounting wherein databases are known to have a significant role to play in practice, rated themselves as having a low level of proficiency in database applications such as Access. By virtue of hindsight, it would have been interesting to know the reason behind their not having familiarised themselves in working with database applications. During the analysis of the interviews, it was observed that the faculty had little or no familiarity with dedicated database applications such as Access. As there was no provision for a corresponding probe in the interview structure that would have allowed for gauging the cause of this lack of familiarity, follow-up interviews with SC and LD who respectively teach accounting and marketing subject wherein DBMS have a significant role to play, were conducted. Whilst SC commented that the present suite of applications she was using contained DBMS capabilities which *'quite sufficed'* her requirements, LD stated that he *'did not see any use of it'* from the perspective of what he was teaching in his marketing courses.

The level of familiarity with graphics, multimedia and desktop publishing (DTP) applications was also on the lower side on part of the respondents. LD, though ranking

himself as having a low level of proficiency in these types of applications indicated his tendency to use streaming video effects in his class presentations as well as DTP software for creating marketing posters and brochures for his marketing classes. PM who professed to having a high degree of familiarity with this family of applications singled out Web page design with animation effects and filters as tools of particular relevance to him. Again, given the nature of these applications, it would have been of interest to know their potential usage for GM in his lectures on public relations. In response to a follow-up question, GM expressed regret at not having had the 'necessary grounding' in the form of formal training in the usage of 'fancy computer effects'.

The nomenclature related to theoretical concepts in ICT coded as CT leaves scope for an element of ambiguity in terms of their practical usage. No deliberate attempt was made by the researcher to elucidate on this score during the interviews as the actual familiarity would be reflected in the ability of the respondents to associate functions and utilities founded on these concepts that are of practical significance. This approach was vindicated by the responses from LD and PM, who, having indicated their familiarity as well as usage of computer theory ideas such as networking went on to cite and elaborate on the practical utility of concepts like file transfers and backups in networked environments, data compression and archiving and bandwidths.

SC and PM indicated having a high degree of familiarity with Excel as well as using the application for their teaching purposes. Plotting graphs and performing simple statistical calculations were citied by PM as the principal utilities offered by Excel. LV, though rating himself low in terms of user proficiency in Excel, pointed out that the formula and function tools were of particular utility to him insofar as his application of it to pedagogy

was concerned. LD and GM on the other hand, professed to not finding any usage of spreadsheet application in their teaching activities, coupled with having a low level of familiarity in working with it.

The above discussion, based on the analysis of the interviewee responses to the first four questions of the interview, provides a glimpse into the extent of the IFT faculty's familiarity and usage of generic applications. The size of the target group (or sample, in retrospect, derived on the inferences vis-à-vis APETIT in Chapter 3) imposes limitations on making sweeping generalisations. However, it is noteworthy that the extent of similarities and differences observed in the ICT usage and proficiency attributes, with the attendant variety in nature of subjects taught by the five respondents, attests to the very diversity of the respondent profiles in terms of their individual academic backgrounds. Derived from the information which the researcher is privy to by virtue of collegial fraternity, no two respondents have had their tertiary education in the same country or background. That being the case, this 'unity in diversity' points to a thread of commonality in the application of ICT in pedagogy.

5.4.4.2 *Faculty Opinion*

Questions five through eight in the interviews were designed to solicit the six faculty members' opinion of the role of ICT in fostering managerial competencies in the IFT students. All save one (LD) replied in the affirmative on the necessity for students to be ICT savvy in order to become successful managers. On being probed further, those who thought in the affirmative supported their answer by arguing along the lines that it is a

global trend wherein irrespective of the industry or sector of the economy, management aptitude ought to be able to spot the technological innovations that have a potential to contribute towards the organisation's efficiency and effectiveness and also engage appropriate talent in their acquisitions and implementations. SC went so far as to suggest that it is an essential *'survival tool'* in any industry. Providing an analogy to underscore the importance of this issue, PM remarked that *'if you are a photographer, you must know how to handle a camera'*. Though LV also replied in the affirmative, he saw ICT as a mere communication tool in the business world, used primarily for information delivery and access. He stressed that in order to become a successful manager, it is essential to have more analytical abilities rather than *'technical'* (read transferable) skills. The only dissenting opinion came from LD, who after a certain degree of prevarication, stated that he did not recognise ICT proficiency as a crucial skill for managers. He further elaborated that possessing ICT skills could open more opportunities but this did not necessarily imply being an effective manager. Without any leads by the interviewer (investigator), he did acknowledge that ICT has a role to play in managerial decision making and that notwithstanding, stressed that he stood by his opinion.

Interestingly, despite harbouring such a sceptical view on the necessity of being proficient in ICT skills for becoming a successful manager, LD, when asked if there were any particular software related to his subject that he would want his students to be familiar with, listed an entire range of applications which included on-line questionnaire design for marketing research, higher end relational database management system (RDBMS) viz. Oracle or SAS and fusion technology to create powerful multimedia effects in marketing related activities. In response to the same question, SC stressed the importance of Access for accounting purposes whilst the other respondents, except JI, to whom this question was

not applicable, did not have any particular application aside from those listed in Table 5.4 that they would want their students to be familiar with.

Table 5.12 Faculty Opinion on Important ICT Applications

ICT Skills	Rank 1	Rank 2	Rank 3	Tally
CT	JI; PM		LD	3
WP	SC; LD; GM		PM; LV	5
XL	LD; JI	SC; PM; LV	GM	6
GR			LD	1
DB	JI	LD		2
EM	JI; LV	LD; GM	SC	5

When asked to rank the three most significant generic ICT applications from a list of six (as summarized in Table 5.4), the interviewees' responses varied considerably. Some insisted on allocating a rank to all the listed applications whilst others restricted themselves to short-listing three in accordance to the rank of their choice. JI emphasized that the three applications she had short-listed were of equal significance and should be considered in combination, rather than individually. PM added a caveat to the choice of his ranking by emphasizing that the importance of an application depends on the focus of the manager. He further elaborated that if the focus is, for instance, on finance, the manager obviously will have to be familiar with spreadsheet applications whilst in the case of marketing, the manager will be expected to have knowledge of working with DBMS such as Access. LD cautioned about the necessity to demarcate between transferable skills and analytical abilities in the usage of ICT, both of which are essential from a manager's perspective. This comment is very much in line with the categorisation of the ICT applications discussed in Chapter 4.

The outcome of the ranking exercise has been tabulated in Table 5.12, the extreme right column of which provides a cumulative tally of the applications that 'made it' to the top three slots. Excel leads the pack followed by Word & Power Point and Internet & e-mail sharing the runners up slot, though in terms of being ranked first, Word & Power Point outdo Excel and Internet & e-mail. Thus, there seems to be a general consensus among the respondents that knowledge of a spreadsheet application such as Excel is vital for the students in order to develop managerial competencies apart from generic operational software like Word, Power Point and the Internet. A comparison of Tables 5.11 and 5.12 yields no perceptible relationship between the faculty members' ICT interface profile and their corresponding opinions on the importance of ICT applications in developing managerial competencies among the students. For instance, respondents with high as well as low proficiency levels in Excel ranked it among the top three applications that the students should be familiar with. With all the attendant limitations therefore, it can be reasonably claimed that the extent of importance attributed to an ICT application in this context is not hostage to the attributor's level of proficiency in it.

To the question whether ICT facilitates the pedagogic process, the answers were varied both, in length and substance. LV was non- committal whereas LD expressed indifference, with the others replying in the affirmative. LD justified his indifference on the grounds that the sheer variety and complexity of existing applications is mind-boggling, thereby creating a steep learning curve which consequently could prove a detraction from the original purpose. PM shared this concern, though on a different note listed a host of factors that made ICT a useful tool in the teaching/learning process, some of these being flexibility, eco-friendliness and interactivity. He also cautioned that easy access to all sorts of information, authentic or otherwise, via the Internet could take its toll on the usage of

library resources which are usually associated with a high degree of reliability and authenticity. LV levelled criticism on the misuse of ICT in the sense that *'what can be done simply is made to be unnecessarily complicated'*, thereby underscoring the importance of *'when to use what'*. He further emphasised that principles of teaching require the teacher to impact all five human senses and the misuse or overuse of ICT could actually prove a handicap, citing as an example how the use of Power Point in the classroom environment deprives the students from taking down notes in anticipation of readymade handouts and thereby compromising on their ability to learn by repetition. On the same note, GM had a radically different perspective in that he considered Power Point as a prompter in the classroom context, enticing the students into two-way interaction and classroom discussion and thus emancipating them from the learn-by-rote method. The responses yielded a rich harvest of diverse and sometimes contradictory opinions ranging from ardent support for the usage of ICT in the classroom to rank indifference and even outright scepticism and reluctance.

When invited to point out whether any important aspect pertaining to ICT in grooming management skills ought to have been included in the interview, none of the respondents had anything further to add, thereby dampening the intended 'snowball' effect referred to in Section 5.4.3. Also, in contrast to Kim, Shim and Yoon's (1999) contention that educators accord a high degree of importance to emerging issues such as e-commerce, none of the interviewees alluded to these type of concepts. As is evident from this analysis, even a small target group of six faculty members teaching generic non-core subjects has generated a wealth of diverse opinions and perceptions in the form of their responses on issues related to the relevance of ICT in developing competencies required of management talent in the students. Strictly speaking, this group has been defined within the framework

of the local Macao context. However, on the strength of the inferences arrived at in Chapter 3, the localised contextual constraints notwithstanding, this group of six faculty members can also, with a reasonable degree of confidence, be construed to be typically representative of a pool of academics in the APETIT member-institutions engaged in teaching non-core management subjects of the generic type focused on the development of strategic and conceptual competencies. Having thus secured the opinion of the faculty, the next section probes into the perceptions and expectations of the tourism and hospitality industry practitioners.

5.5 Industry Perceptions

The dynamics governing the local industry operations are strongly influenced by a host of socio-economic characteristics unique to Macao which oftentimes are 'out of sync' with global trends. This in part explains the fragmented nature of the industry which was brought into focus in Section 1.5 of Chapter 1. The relatively small scale of operations compared to other trend-setting markets further accentuates the conflicting inter-play of globalisation trends with local nuances, making any attempt at a generalisation of the industry's characteristics a challenging proposition. One such nuance is the relatively low level of esteem traditionally associated with the 'service' profession in this society in comparison to other white-collared vocations. The other which is of direct relevance to this aspect of the study is a pervading sense of wariness to express opinions and points of view on record, no matter how non-controversial the topic may be. This could be attributable to a unique juxtaposition of power distance and risk averse proclivities in the Chinese society

which is derived from Confucian dynamism (Hofstede, 1991), in combination with the extent of interconnectedness and at times, even conflict of interests that characterise an undersized society like Macao.

A factor that further aggravates the circumstances is the researcher's lack of ability to speak Cantonese, which is the dominant local language. In the absence of a strong personal rapport, the scepticism associated with divulging information immensely diminishes the scope for generating primary qualitative data. Thus, the heightened risk of obtaining little or no relevant information on account of evasive responses or even lack of them negates the advantages of using interviews (and by extension, semi-structured surveys) as an instrument for research on a broad field study basis, thereby severely crippling the ability to derive views and opinions from the myriad associations mentioned in Section 1.5 of Chapter 1 that proffer to represent the industry's interests. There have been instances in the past wherein research plans have had to be radically altered or even abandoned whenever it came to gauging overall industry opinion. Besides, some of these associations also double as *de facto* trade unions, embodying the interests of non-managerial staff and workers, thereby being of little relevance to the context of this study.

5.5.1 Defining the Target group

From the above discussion, it is evident that the ground realities inhibit the articulation of objective criteria for constituting a target group of interviewees from among the dedicated industry practitioners that could be considered as being truly representative of the industry, the absence of which necessitates the adoption of an alternative albeit less cogent

approach. It was pointed out in Section 1.7 of Chapter 1 that IFT has been having to recruit practising professionals to teach in the subject areas of their expertise on a part-time basis during the course of the semester to supplement the full-time faculty, which are very modest in number, so as to be able to comprehensively cover the scope of the curriculum. Those listed in Table 5.13 are among those in the part-time faculty who are practicing professionals in the tourism sector. Given their concurrent work experience in and exposure to the industry as well as their role in teaching potential industry managers of the future, it would be reasonable to assume their predisposition towards contributing to a study of this nature by virtue of expostulating on their views of the ICT competencies required of managers in the tourism sector. On another note, their ability to converse in English eliminates the language barrier altogether, thereby making them suitable candidates in their capacity as industry practitioners for interviews aimed at gauging the industry's opinion. However, to what extent these can be interpreted as being truly representative is a moot question and this uncertainty can be construed to be an unavoidable weakness of this study.

Table 5.13 Industry Interviewee Profile: Designation, Company & Schedules

Interviewee	**Designation & Company**	**Interview Date**
Lobo Luis (LL)	OperationsConsultant & Interim General Manager, Palacio Bel Monte	13 November 2002
Lobo Pedro (PL)	Managing Consultant, Starway Travels	13 November 2002
Lao Rebecca (RL)	Sales & Promotion Manager, MIL	20 November 2002
Ng Clara (CN)	Director of Rooms, Westin Resort	22 November 2002
Nunes Fatima (FN)	Operations Manager, New Express Travel Limited	18 November 2002
Salgado Carlos (CS)	CEO & Airport Director, Macao Airport Development Authority	14 November 2002

5.5.2 Interview composition & methodology

The arguments for the choice of interview as the research instrument are derived from the discussions in Section 5.4.2. The interview comprised of a total of ten questions. Required fields detailing the respondent profile were recorded on the cover page. In the interest of achieving a greater degree of consistency in the comparative analysis of stakeholder perceptions, the questions were structured along the lines of those for the faculty interviews. Relevant modifications were introduced, which *inter alia* allowed for assessing the interviewees' extent of exposure and usage of ICT, not just in their present professional designations, but also during the entire length of their tenure in the industry. The interview question list is provided in Appendix 8. The penultimate question was of a very generic nature and was formulated with the intention of gauging the respondents' overall judgment on the contribution of ICT to the tourism sector.

Through the good offices of the IFT Registry, the researcher obtained the contact details of the target group of interviewees. One of the potential interviewees, Mr. Douglas Brennan who was Recreations Manager at the Westin Resort in Macao and taught recreation management at IFT on a part-time basis was not available on account of his recent transfer to the Westin's Hainan property in China. At the time of writing this component of the thesis, no replacement from the industry was found and his teaching duties for the semester were taken over by two of IFT's full-time faculty members. The researcher approached the rest of the industry practitioners listed in Table 5.13 with a request for interview, explaining its purpose and objective. All consented to the interviews which were

conducted during November 2002. The interviewees also granted their consent to being quoted verbatim, where necessary. Apropos their request, an advance copy of the interview questions was provided to the interviewees. *Post factum*, a note of thanks was communicated to all the interviewees, a sample of which is provided in Appendix 9.

5.5.3 Outcome

Unlike in the case of faculty interviews, wherein the analysis was performed on a question-by-question basis, the scrutiny of the industry practitioners' perceptions has been carried out in a respondent-centric format in the chronological order of the interviews. Such an approach has been deemed more appropriate in the context of this study from the point of view of placing the responses in the perspective of the respondents' individual industry experience, which is an important dimension in the analysis.

The first interviewee on the schedule was Mr. Pedro Lobo (PL) who has had twenty-two years of industry experience, starting his career in the area of hotel operations at the Hong Kong Sheraton Hotel. He has held senior management positions, mostly in the operations area in major hotel properties in Hong Kong and Macao and is presently a Managing Consultant at Starway Travels Limited. Though he did not have extensive opportunity to use generic applications *'hands-on'* in the discharge of his duties, PL rated himself as being familiar with presentation and word processing applications, Internet and e-mail, spreadsheets and database systems in that order. Elaborating on why he felt ICT proficiency was necessary on part of students aspiring to become successful managers in the industry, PL recounted his personal experience in terms of having to depend on reports

of varying periodicity and data for all sorts of managerial tasks such as budgeting, human resource planning, forecasting and even staff appraisals. He regretted not having sufficient level of familiarity with analytical applications such as Excel and Access and stated that in the recent past, he has been attempting to *'make miracles happen by applying ICT in decision making'*. He emphasised that communications, presentations and analyses were part and parcel of managerial skills and hence considered networking concepts, Excel, Word and Power Point as being applications essential for a building a successful career in the industry. Speaking specifically about Macao, PL expressed his concern at the low level of ICT awareness that afflicts the present management cadres and how that would have an adverse impact on the expected and impending growth of the industry in the wake of the deregulation of the gaming industry. He linked ICT proficiency to being open minded and *'accepting knowledge gracefully in contrast to shunning it in the days of yore'*. In reply to whether there ought to have been any other question in the interview relevant to this topic that was not asked, PL suggested touching on issues related to other operating systems such as Macintosh which also has an extensive suite of application software, some of which are superior to their PC compatible counterparts. In his concluding remarks to this interview which lasted for about forty minutes, he stressed the need to ask and address the '*all important*' question on whether the students have the ability to conceptually compile the information processed through ICT and leverage it to their advantage.

Next in the interview sequence was Mr. Luis Lobo (LL), who, in a career in the industry spanning twenty years, has also been a General Manager at resorts and hotel properties in Taiwan, the Philippines and Portugal, his latest stint being with the Palacio Bel Monte in Lisbon as Operations Consultant and Interim General Manager. LL has extensively interfaced with the entire suite of Microsoft Office applications in performing his

professional duties apart from industry specific applications such as Property Management Systems (PMS) and Point of Sales Systems (POS). Stating that ICT proficiency was *'absolutely indispensable'* for making a successful managerial career in any industry, he stressed on the contribution of generic applications in the hospitality and tourism sector in enhancing efficiency and productivity. When asked to rank the top three applications he thought were most important from this aspect, he chose to do so on the basis of his experience in terms of frequency of usage. Ranking Word and Power Point as being the most extensively used applications for documentation and presentation purposes, he underscored the importance of effective communication and interchange of ideas in this *'people's industry'*. Excel found the next most extensive usage in LL's portfolio of generic applications. He dwelt on the computational and analytical capabilities of Excel and while acknowledging the potential of its analytical prowess, admitted to using it largely for descriptive statistics in generating tables and graphs for reports. He however lauded the Internet as a vast repository of secondary data, both, raw and processed, which provided critical analytical inputs at the macro level such as evolving market trends. In his opinion, Access was much too generic and instead, the industry has benefited largely from database utilities built into their PMS which greatly enhance customer relationship management (CRM) and marketing activities. LL pointed out that an important issue not covered in the scope of the interview was the role of ICT from the perspective of discipline and individuality which are critical attributes in the industry. He stressed the need for the current crop of industry managers in Macao to *'think out of the box'* and hoped that the existing tendency to *'get others to do it'* would be replaced by a more proactive and dynamic approach from the perspective of ICT usage.

The third interview took place at the office of the Macao Airport Development Authority (ADA) with their Chief Executive, Mr. Carlos Salgado (CS). CS's association with the industry dates back to 1985 and during the interceding years, he has been associated with its various facets including infrastructure, resorts and airport facilities. CS recounted having first interfaced with ICT in 1992 in terms of discharge of his professional duties. Describing himself as belonging to the old generation, he dwelt on the efforts he had to put in to overcome a steep learning curve in being comfortable with using ICT, which he now considers an indispensable tool. CS rated himself as being very proficient in using Word, Power Point, Excel and the Internet as these were the applications that he required at work. Graphic applications and Access were not particularly useful from his point of view and hence he did not perceive the necessity to get himself familiarised with them. He fervently agreed with the statement that students aspiring to successful managerial careers in the industry should be proficient in ICT. He brought into focus the range of applications that have penetrated the hospitality and tourism sector right from humble restaurants that use POS terminals to major travel and hotel chains and airlines that require computer reservation systems (CRS) to achieve operational efficiency. In his opinion, irrespective of the industry, a manager has to be effective and generic ICT competencies provide the tools that are necessary for this. On this score, he chose to rank Excel, Word and Power Point and concepts in networking as applications that are of crucial significance to a manager. He opined that in the initial stages of the career, the importance of communication and presentation skills is supreme, underlining the significance of Word and Power Point. However, as one moves up the career ladder, decision-making tools such as those packaged in Excel take precedence as these help tackle the complexity of tasks associated with critical decisions in almost all areas of management. CS went on to add that irrespective of the stage at which one is in ones career, it is important to develop a logical

mental structure in terms of organising one's work from the point of view of efficiency and effectiveness and herein he believes concepts in networking and file management have a pivotal role to play. He chose to underscore the benefits that the industry has accrued from the developments in ICT by placing the issue from an end-user's (customer) perspective. That an entire travel itinerary including airline reservations, ground transport, hotel bookings, travel insurance, tour packages and in some cases even restaurants can be planned and purchased on-line '*with the click of the mouse*' points to the enormity of ICT enabled back office tasks on part of the suppliers of these services. CS felt that the scope of the interview was sufficiently comprehensive in terms of meeting its stated objectives.

Ms. Fatima Nunes (FN) who is currently the Operations Manager with the New Express Travel Group was the subsequent interviewee. Since 1992, FN has been involved with the airline business, having been the general sales agent (GSA) in Macao for major European carriers such as British Airways and Air France. Her job profile has required intense usage of ICT in the form of airlines reservation systems and GDS since the time she entered the industry. In discharging her present job responsibilities as an operations manager, FN has been using networking concepts, Word, Power Point, Excel, graphic applications, Internet and e-mail over and above the industry specific applications. FM chose to voice her opinion on the necessity to be proficient in ICT usage on part of students majoring in hospitality and tourism studies by drawing upon her observations on her subordinates who have graduated from IFT. Cautioning that she did not intend to make sweeping generalisations, she remarked that her staff who graduated from IFT tended to be less efficient in the application of ICT at the workplace in comparison to their colleagues who were recruited from Taiwan. She attributed this disparity to the '*possible underexposure to the ICT culture in Macao*'. In her perception, Internet and e-mail, networking and file

management concepts along with graphic and desktop publishing applications are the three most important applications in that order that a student should be comfortable with in interfacing in order to become a successful manager. When asked to elaborate on why she deemed these applications to be of greater import than others, she attested to their significance in terms of her own usage of ICT in the workplace. FM cited a concrete example of the airlines and hotels discontinuing the supply of their printed information booklets and brochures on timetables, fare structures and policies to travel agents who are now advised by the suppliers of these services to access the information on-line. She opined that with the extent of demand on precise and timely information in the travel business, the industry would grind to a halt without ICT. According to her, given the geographical proximity to China and the magnitude of growth of its economy, it is necessary to make the local tourism practitioners effective in the usage of Chinese software applications in the interest of better product integration. FM was of the opinion that this being an important point, should have been included in the structure of the interview.

The following interview was conducted with Ms. Rebecca Lao (RL) who is currently with Macau Industrial Limitada as Marketing and External Affairs Manager. RL has had six years of experience in the industry which includes a stint at the Ryerson University's training hotel in Toronto, Canada, as well as with American Airlines in the area of marketing research. RL rated herself as being proficient in all the generic applications listed in the interview over and above GDS and CRS applications in which she claimed to have a medium level of competence. She placed special emphasis on the statistical functions in Excel which she uses extensively for her marketing research as well as on animation and multimedia effects in Power Point presentations. RL stressed the need for tourism and hospitality students to be proficient in ICT as it helps improve efficiency,

quality of service and creativity. On being asked to rank the three most important applications required to discharge managerial responsibilities in the industry, RL opined that all the generic applications listed in the cue card were indispensable and hence of equal importance. These, she stated, were the most commonly used tools from her own experience. On the benefits of ICT to the tourism industry, RL brought into fore the apparent contradiction, as she saw it, between high tech and high touch. Elaborating that in its present state of development, ICT, despite the benefits it brings to the tourism industry in terms of efficiency, tends to be impersonal, she expressed the hope that with further advances in the area of interactivity and artificial intelligence, the human touch factor, on which the industry places a premium, will be an integral part of ICT. These sentiments resonate with the recent trends in developing CRM systems in the hospitality and tourism industry whereby the prowess of ICT is harnessed in ensuring efficiency and effectiveness without compromising on the human element of the interaction between the clients and the service providers. In response to whether there were any points relevant to the subject of discussion that were not included in the interview, RL suggested that the inclusion of a question that could assess the difficulty of users in interfacing with ICT applications would make the discussion more complete.

The final interviewee was Ms. Clara Ng (CN), presently the Director of Housekeeping at the Westin Resort, Macao. CN has been with the industry since 1984, with a career that spans across different aspects of the hospitality business such as front office, rooms and housekeeping. She has worked in the major hotel properties of Macao, Hotel Lisboa and the Westin being the more recent ones. CN stated that ever since she joined the industry, she has had to interface with ICT. Except for Access, graphical and desktop publishing applications on which she rated herself as having low proficiency, CN has used all the

generic applications listed on the cue card and is now reasonably proficient in their application to her job duties. She did however remark that despite using networking and file management concepts at work, she was not as fluent as she would have desired in understanding them. Relating to her own industry experience, she agreed that in order to build a successful managerial career in the industry, proficiency in ICT is a must. She stressed that throughout her years in the industry, she has had to rely on ICT in one form or another, be it rooms, front office or housekeeping. She added further that it was not just the PMS she was referring to but generic applications as well. In CN's opinion, no manager could afford not to be conversant with networking and file management concepts, Excel, Word and Power Point, Internet and e-mail applications as these tools greatly facilitated producing reports, analyses, presentations and memos. As a case in point, CN drew attention to an Excel file containing inventory data in housekeeping which was on view on her desktop computer monitor at the time of the interview in her office at the Westin Resort. Familiarity with Access, graphical and desktop publishing applications was desirable according to her, though not a must. On the contribution ICT has made to the industry, she recalled that in 1984 when she entered the industry, not all managers had computers on their desks. Attending to routine work procedures entailed spending a lot of time behind the desk despite secretarial support. The infusion of ICT over the years has greatly contributed towards reducing transaction time and enhancing efficiency, thereby allowing managers in hotels more time to interface with the guests, which is a crucial attribute in this industry, rather than spending time behind the desk. In this era of cost cutting and downsizing, ICT has come to the rescue of managers who often have to do with little or no secretarial support. CN had nothing further to add when asked whether there were any other points pertaining to ICT in grooming management skills that were not hitherto covered in the interview.

From the above narrative of the responses to the interviews, it is evident that the industry practitioners interviewed for this study, all of whom incidentally have been or are in senior managerial positions, are adept at using generic ICT applications in the workplace. The diversity of the interviewees' current job profiles and past work experience attests to the permeation of ICT in the industry on a universal scale. The proficiency in a given application on their part is characterised by the value it adds in terms of facilitating the discharge of their concurrent job responsibilities. This in turn seems to influence their perceptions on the importance of a given application in contributing to a successful managerial career in the industry. In this case, the correlation between the usage of an ICT application or concept in the workplace and its perceived significance on part of the industry practitioners is more pronounced than in the case of the academic faculty, suggesting that whilst academics tend to take into account the overall potential of an application in contributing to their subject area, industry practitioners display a propensity to base their judgment on the tangible value an application brings to their job functions. Also, the industry practitioners' responses to questions regarding the necessity on part of hospitality and tourism management students to be conversant with ICT, and the benefits of ICT to the profession were mutually more consistent in contrast to those of the academic faculty. Networking & file management, Word & Power Point, Excel, Internet & e-mail were the applications that stood out as being almost unanimously perceived as tools that contribute significantly to the managerial decision making process in the industry.

5.6 Discontinuities

The comparison of the outcome of the students' survey and interviews with academic faculty and industry professionals allows for the possibility to identify the gaps in expectations vis-à-vis proficiency in ICT skills in the tourism sector. However, before embarking upon such an exercise, it would be of interest to locate common grounds on which the perceptions of the stakeholders converge. Graphic & desktop publishing applications along with Access seem to be perceived as having relatively low level of importance by students, faculty and industry practitioners alike whilst on the other hand, Word & Power Point, Excel and Internet & e-mail were accorded the highest significance in terms of their role and potential as tools *sine qua non* for documentation and presentation, analysis and communications which are essential managerial functions. These findings are partially consistent with the arguments forwarded in Section 4.3 of Chapter 4 wherein the applications of the conceptual and strategic type were labelled as being career critical. The stakeholder perceptions seem to imply that DBMS such as Access, a conceptual and strategically focused application, is not essentially career critical, in that familiarity with this application could be desirable but not necessary. Such an inconsistency could be attributable to the specific nature of the Macao market, which being small in size, may not need to place a premium on familiarity with sophisticated DBMS conceived for larger markets. This once again underscores the contextual dependence of such a study. The stakeholders' verdict on Excel, however, was in total conformity with the deliberations in Chapter 4. To what extent this conceptual and strategically focused application contributes towards the students' analytical decision-making capabilities forms the topic of discussion of the following chapter.

The perceptions of each of the three stakeholder groups are influenced to some extent by their immediate environs. For instance, the responses of the industry professionals seem to suggest that they accord reasonable importance to concepts in networking and file management as a necessary skill for managers in the industry, based on their concurrent experience and needs. The students however, tend to accord a low priority to this competency in so far as its potential utility in their future career development is concerned and there is no convergence of views on this aspect among the faculty. An interesting aspect of the outcome of this study reveals the students' awareness of contemporary issues related to the convergence of ICT and business such as e-commerce, B2B & B2C transactions, e-banking, m-commerce and POS technology and their desire to get an exposure to these concepts by virtue of their inclusion in the ICT syllabus. None of the faculty and industry practitioners who were interviewed alluded to these issues despite the subtle probes employed by the interviewer. That these issues which are considered 'hot topics' in shaping the future of the industry should find a mention in the students' responses and not those of the faculty and industry practitioners flies in the face of conventional wisdom. This apparent oddity of sorts, however, is in line with the arguments forwarded in Section 4.3 of Chapter 4 wherein it was pointed out that the spur in the penetration of ICT at the pre-university level has contributed to the shaping of the techno-savvy generation (a.k.a. Gen-X) of students at the tertiary level. This also explains the students' verdict on the level of teaching of ICT competencies in the existing syllabus which was perceived to be from being just about right to too basic.

Note also needs to be taken of the reasonable concurrence of opinions on the benefits that accrue from employing ICT from the perspective of the stakeholders. This finding can by

no means be construed to be unanimous on account of a few discordant views on part of some faculty members. The element of heterogeneity on account of individual characteristics and personality traits shaped by experience explains the randomness of the responses. However, as this study has sought to demonstrate, it is possible to glean the 'gist of the matter' and arrive at some plausible conclusions, albeit on a more subjective plane. To quote Albert Einstein (Famous Quotations Network, 2002), problems cannot be solved at the same level of awareness that created them. After all, all that can be counted does not count and all that counts cannot be counted. The discontinuities that have been identified in terms of the generic ICT competencies from the perspective of the stakeholders can serve as a basis for making recommendations for formulating a more effective ICT syllabus geared at meeting the needs of the tourism industry.

5.7 Chapter Summary

The objective of this chapter was to identify gaps and commonalities with respect to stakeholders' perceptions on the various facets of ICT in tourism. This goal was realised by describing the stakeholders' profile, defining and operationalising appropriate instruments to solicit their perceptions, identifying the contextual constraints that characterise this study and performing a comparative analysis of the outcome. Considered independently, the analysis of the responses from each individual group of stakeholders has been able to provide an insight into their unique angle of looking at the issue. The stakeholder responses were put into perspective of the analysis of ICT competencies in tourism education and industry carried out in Chapter 4. On the strength of the inferences

arrived at in Chapter 3, there are reasonable grounds to assume that these findings would be applicable in fair measure to academic institutions having a profile similar to that of IFT. The outcome of this chapter provides the groundwork for recommendations for the formulation of an enhanced ICT syllabus geared at fulfilling the management competencies requirement of the tourism industry in an intensely competitive and fast-evolving information age. The contents of the concluding chapter of this thesis focus on the formulation of these recommendations. Also, conceptual and strategically focused applications that contribute towards honing analytical abilities which were found to be relevant and applicable by consensus in the industry were identified in this chapter. In this regard, the perceived importance of Excel was established. To what extent this perceived importance is substantiated forms the topic of discussion of the following chapter wherein Excel is employed as a CAI tool in teaching statistics, a non-core subject and its impact on students' understanding of the subject matter is assessed.

CHAPTER 6 CAI AS A FACILITATOR IN TOURISM MANAGEMENT EDUCATION

6.1 Chapter Introduction

As part of exploring the broader issue of gauging the impact of Information and Communication Technology (ICT) on management education in the tourism sector, the purpose of this chapter is to determine whether Computer Assisted Instruction (CAI) enhances students' performance in Statistics-II which is a non-core course common to students of both the majors viz. Hotel and Tourism offered at IFT. This subject which is taught in the second semester of the second year of study is a continuation of a course on descriptive statistics (Statistics I) delivered in the preceding semester (Appendix 3). In what typically comprises a fifteen week-semester, Statistics-II which focuses principally on topics in inferential statistics, is taught for two academic hours per week wherein fifty minutes comprise an academic hour. This being a course common to both streams, the syllabus, pedagogic methodology for course delivery and the evaluation scheme are required to be identical for any given intake. The preceding chapter has brought into focus the importance of Excel as a strategic and conceptual application and its suitability as a platform for CAI. By varying the magnitude of CAI applied in Statistics II across four intakes, the impact on the students' performance was monitored from intake to intake. Using appropriate statistical procedures, a series of hypotheses was formulated to determine the impact that CAI had on students' scores. The outcome of this study will

contribute towards establishing the influence of Information and Communication Technology (ICT) in terms of classroom usage towards enhancing students' level of comprehension and performance of non-core discipline areas in tourism and hospitality management programmes.

6.2 Methodology

An empirical approach was adopted to investigate the research problem. After considering a range of empirical approaches for this study, two designs were short-listed out of which one was ultimately adopted. One alternative was a cross-sectional design (Design A) whilst the other was a variation of a longitudinal design model (Design B). The latter was eventually favoured over the former, the reasons for which are elaborated in the ensuing discussions. The study was planned over a span of four years, commencing in September 1998 and culminating in June 2002. Each intake comprised of two streams viz. Hotel management and Tourism management. The coding scheme which is used in subsequent discussions of the results and their interpretation for the four intakes along with their subgroups representing the two streams is shown in Table 6.1. For example, S-97 stands for the intake that commenced studies at IFT in the academic year 1997-1998, beginning in September 1997. In turn, this intake comprises of two subgroups, BH(97) and BT(97) representing the hotel and tourism streams respectively. All the four intakes were taught Statistics II by the same lecturer (also the investigator). The syllabus as illustrated in Table 6.3 (series a to d) in terms of contents remained unchanged throughout the course of the investigation. As there was no random allocation to the groups, the approach could more

aptly be defined as a quasi-experimental design. A brief description of the two designs that were considered ensues.

Table 6.1 Magnitude of CAI per Intake

Intake	BH (Hotel Management)	BT (Tourism Management)	Component of CAI in Statistics II
S-97 (batch admitted to IFT in 1997)	BH(97)	BT(97)	0%
S-98 (batch admitted to IFT in 1998)	BH(98)	BT(98)	10%
S-99 (batch admitted to IFT in 1999)	BH(99)	BT(99)	55%
S-00 (batch admitted to IFT in 2000)	BH(00)	BT(00)	70%

Design A

Conventionally, in a cross-sectional design unrelated groups are compared more or less in the same timeframe (Oppenheim, 1992). In this context for any given intake excluding S-97 wherein no intervention would be used, one of the two groups, either the hotel or tourism stream, would be designated as a control group whilst the other would be the experimental group. Say, for S-98, Statistics II would be taught to BH(98) in a conventional format devoid of any CAI whereas BT(98) would be exposed to intervention in form of CAI to the extent of, say, 10% of the Statistics II syllabus (in terms of the weight and allocated time). For the two streams, the means of the students' grades at the end of the semester which would be reflective of the performance of the groups, would be

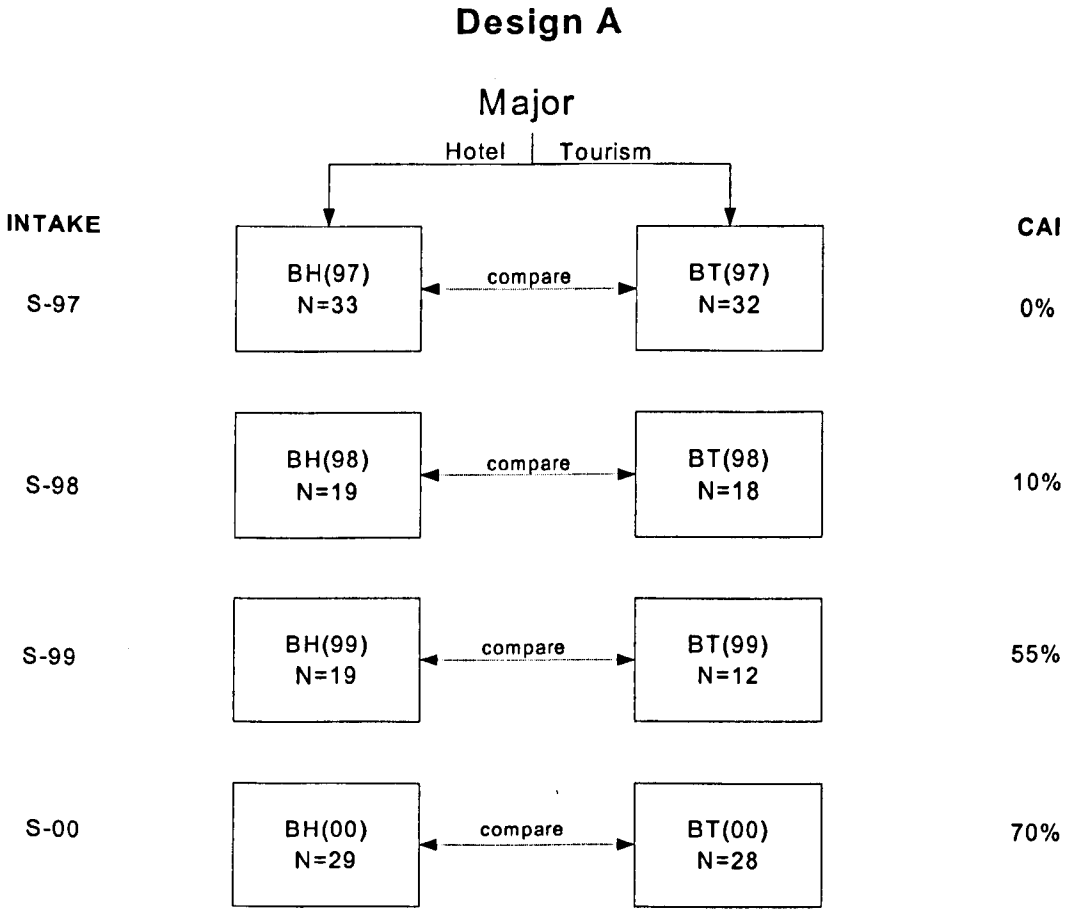
compared to check for significant differences. *Ceteris paribus*, the procedure would be repeated for the subsequent intakes S-99 and S-00 albeit the extent of CAI would be enhanced to 55% and 70% respectively in the case of the experimental groups. The design layout is illustrated in Figure 6.1 In the event that there is no significant difference between the mean scores of BH(98) and BT(98), the investigation would probe further into examining whether increasing the magnitude of the intervention to 55% in the case of the experimental group of S-99 would make any difference. Else, the outcome of S-99 would serve as a measure of validation to that of S-98 in that CAI does indeed influence students' performance and offer a perspective, though not a statistically rigorous one, on the magnitude of the difference. The outcome with the S-00 would then serve to further consolidate the conclusions in either case.

The application of the hitherto described instrument would have implied an intra-intake comparison. The variability among students across the two streams within the same intake would be relatively less in relation to an inter-intake comparison which forms the basis of Design B. Also, repetitive application of the instrument across the intakes would have provided credence in terms of its validity, differences in the magnitude of the intervention notwithstanding. However, adopting such an instrument would have

- mandated an abrogation of the requirement that the syllabus, pedagogic methodology for course delivery and the evaluation scheme be identical for both streams in any given intake

- created an ethical dimension by affording a learning environment that would possibly help enhance performance to one group whilst denying the same to the other group from the same intake, thereby causing intentional disparity in their grades by virtue of reasons other than merit

Figure 6.1: Design A



- made it impossible to isolate the influence of potential mediating factors such as differences in the overall curricular structure of the two streams in terms of the balance between core and non-core courses (see Section 2.4 of Chapter 2) on students' performance; by benefit of hindsight as demonstrated in Section 6.3, no significant differences in performance were observed between hotel and tourism groups across all the four intakes.

The issue of unequal sizes of the groups being compared within each intake would have also posed a challenge. This, along with the aforementioned factors inspired the rejection of Design A in favour of Design B, the description of which follows hereunder.

Design B

Longitudinal designs involve repeated measures of the same respondents at several time intervals (Oppenheim, 1992). The design adopted for this research was a variation of a conventional longitudinal study in that the respondents belonged to different groups. The layout of the design is illustrated in Figure 6.2. A pure longitudinal design was not suitable in this situation as the objective of the study was to monitor the influence of CAI on students' performance in Statistics II wherein the magnitude of the intervention was made to vary across the intakes. Curriculum modification from one intake to another being permissible, adopting such an approach ensured the adherence to the condition that there be no disparity in terms of the course structure, delivery and assessment between the two

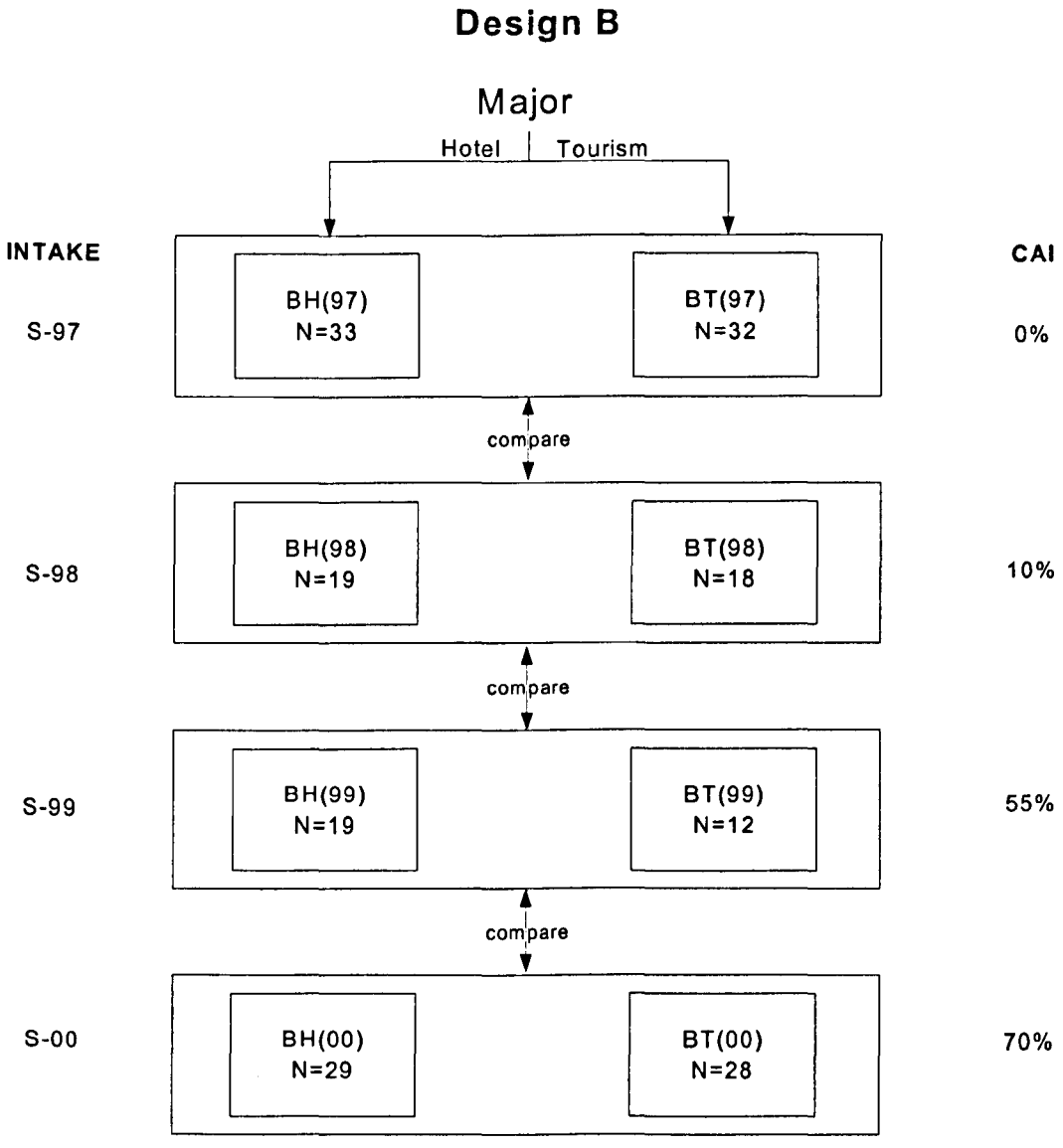
majors of the same intake. However, violating the norms of a conventional longitudinal design in terms of repeated measures with the same respondents had the following implications:

- Though the number of places is limited to a maximum of seventy per intake (Section 1.6 of Chapter 1), the dropout rate (which can be deduced from Figure 1.2) within the first year of study in the case of S-98 and S-99 was particularly high. Therefore, student numbers varied from intake to intake, thereby making non-uniformity in the group sizes an issue. In applying the analysis of variance (ANOVA) procedure to compare the group means (Section 6.13), more conservative *post hoc* tests viz. Tukey test or Scheffe test could not be employed as they rely on the harmonic means of the groups in the event of non-uniform group sizes, thereby not guaranteeing Type 1 error levels. Therefore, LSD which is a more liberal *post hoc* test, had to be taken recourse to.

- Comparison of the students' performance from different intakes on a common attribute could be considered dubious in terms of the reliability of the measure on account of the possibility of batch-to-batch variations. So as to minimise the influence of this factor, the mean cumulative GPAs prior to commencing Statistics II (i.e. until the start of the second semester of the second academic year in which Statistics II is offered) of all the four intakes were compared (Section 6.10). No significant differences were observed, thereby implying that there are no grounds to suggest disparities in the overall level of academic achievement among the constituents of all the four intakes. Moreover, the common admission criteria as

stated in Section 1.6 of Chapter 1 further dampen the magnitude of inter-intake variations, thereby adding credence to the null hypothesis $6.5H_0$ in Section 6.10.

Figure 6.2: Design B



As the hotel and tourism streams are taught separately, an investigation with a pre-determined magnitude of intervention attribute is in effect repeated twice every academic year. Having established that there are no significant differences between the two streams

in terms of their performance in Statistics II (Section 6.12), the consistency in their individual outcomes for any given intake will serve as a measure of reliability.

6.3 ICT Infrastructure for CAI

The ICT infrastructure plays a pivotal role in the delivery of a course in the CAI format. The quality and quantity of hardware as well the type of software are critical in ensuring the effectiveness of CAI. IFT's computer laboratory was used as a venue for conducting classes in Statistics II that required the usage of computers. At the time of commencing the investigation in September 1998, the computer laboratory was equipped with a total of thirty-six IBM compatible Pentium 200 MHz personal computers (PCs), with two workstations serving as master consoles for demonstration and usage by the lecturers and instructors. Thus, a maximum of thirty-four students could be accommodated in the computer laboratory. As the tourism and hotel streams were taught separately, given the class sizes, the ratio of PCs to students was always greater than unity. All the PCs were networked trough an Ethernet connection with a leased line gateway to the Internet. A multimedia educational network system (Hi Class, 1999) used for transmitting the screen of the master console/s to the thirty-four students' workstations was also in place. The operating system in use was MS Windows 95, running among other application software, MS Excel version 5 with PHStat version 1.2 add-in (Prentice Hall, 1998). In 1999, the hardware and the operating system were upgraded to P-2 (350 MHz) and MS Windows 98 respectively. MS Office 97 which included an updated version of MS Excel was introduced in the same year. In 2000, MS Office 97 was replaced by MS Office 2000 and

the PHStat version 1.4 substituted its predecessor as an MS Excel add-in. These upgrades, though augmenting the computational speed and storage memory of the hardware and boosting the capabilities of the software in terms of additional utilities and functions, had no significant impact on the methodology adopted to teach components of Statistics II using CAI. There was no alteration in the type of functions and utilities used to teach a given component of the syllabus for all the four intakes which was brought about by these upgrades. Hence, the influence of the variations induced by these upgrades on the outcome of the study can be discounted.

In terms of the network infrastructure, all enrolled students are provided with an individual 30 MB work folder on the student network drive to which they can download study material such as handouts and store their assignments. The lecturers are also allocated folders on this network drive for uploading their handouts or assignments for students to access. In so far as students' access to the lecturers' folders on this drive is concerned, they have read-only rights which allows them to access and copy the contents to their respective folders but prevents them from making any alterations in the lecturers' folders. An option for a separate drop-box folder is available for the lecturers wherein the students can 'drop in' their assignment files that are too large in size to be e-mailed. The intranet site offers an alternative option to lecturers for electronic dissemination of handouts, notices and assignments to the students. In cases where students are required to submit their completed assignments in electronic format, this is done by e-mailing the file attachments or copying the files to the lecturer's drop in box on the student network drive. The network infrastructure facilitates the two-way flow of information between students and the academic staff. Though this aspect also forms an integral part of ICT in education, it is not the principal area of focus of this study.

6.4 Choice of Application Software Platform

In the context of this aspect of the study, the usage of computers is not an end in itself but is regarded as a means for developing a more effective teaching-learning mechanism. Thus, the emphasis is placed on knowledge gains achieved through the application of CAI as opposed to learning how to use ICT though the latter is *sine qua non* in order to realise the former. Thus, so as to be able to put CAI to effective use, an element of technical competence comprising of a combination of 'practical knowledge of how the software works' and 'psychomotor skills to operate it via an input device' (Davis et al, 1999) is essential. Therefore, within the framework of the available time and pre-defined scope of the subject being taught through CAI, the choice of software would depend not just on its ability to perform the required tasks but also on the extent of its ease of use.

In so far as the teaching of statistics is concerned, the advent of the Information Age has spurred the development of a variety of statistical software such as SPSS (SPSS Inc., 2001), SAS (SAS Inc., 2001) and Minitab (Minitab Inc., 2001). These are highly specialised and powerful subject-specific packages, which by virtue of not being of a generic variety are usually targeted at advanced learners of the subject and have restricted availability through site licences and pared down student editions. MS Excel, on the other hand is a generic spreadsheet application that comes as a standard MS Windows OS application software which provides a versatile platform for quantitative analyses and modelling. In the preceding chapter, the significance attached by the industry stakeholders

(i.e. students, faculty and practitioners) to the role of this application as a strategic and conceptual tool in management was demonstrated. As illustrated in Exhibit 6.1, MS Excel includes virtually all the necessary tools that are required for statistical analysis in an introductory-to-intermediate level course, thus making it eminently suitable for being incorporated into the Statistics II syllabus as a vehicle for CAI. Add-in packages such as PHStat (Prentice Hall, 1998) and Crystal Ball (Decisioneering, 2000) further boost the capability and user-friendliness of MS Excel. Thus, the combination of its computing prowess and ease of use allow MS Excel to play an integral part in providing an application orientation with primary emphasis on statistical methodology insofar as applying it to Statistics II is concerned. Besides, the knowledge of MS Excel is not restricted to applications in statistical analysis alone. As was discussed in Chapter 4, spreadsheet applications are also widely used in other disciplines that require numerical literacy such as accounting and finance. Thus, familiarity with MS Excel does work to the advantage of students studying in management related programmes. MS Excel is the most frequently used spreadsheet application in colleges and universities as well as in business (Anderson et al, 2001). From the point of view of students' career prospects, ability to work with MS Excel provides a distinct advantage since an increasing number of managers use spreadsheet applications to retrieve and analyse data directly instead of depending on their company's Management Information Systems (MIS) departments to obtain customised summaries of corporate data (Levine et al, 1999). Given the afore-discussed advantages that accrue from the knowledge of spreadsheet applications, MS Excel with PHStat add-in was the preferred choice for integration as a CAI tool into the Statistics II syllabus.

6.5 Choice of Subject

Quantitative methods are applied to virtually every branch of public and private enterprise as a tool for informed decision making under conditions of uncertainty. The importance of tourism statistics is not lost on national and regional tourism organisations as these tourism data and their analyses help in monitoring the growth of the industry, gauging its contribution to the economy and formulating strategic policies related to the development of the sector. Therefore, statistics is a subject that is *sine qua non* for academic degree programmes in tourism that purport to impart managerial skills to their students. As regards its perceived importance in the industry, a study by Su, Miller and Shanklin (1998) found that quantitative methods were one of the skill areas considered most important by both professionals and educators. The outcome in Chapter 3 wherein the proliferation ratio of statistics as a subject stands at 0.86 (Table 3.6a) underscores the importance accorded to the subject among institutions offering degree level programmes in tourism studies.

As is elaborated in the following section on the intervention attribute, when taught in a conventional classroom format with the aid of calculators and/or statistical tables, a significant proportion of the class time tends to be devoted to mechanistic calculations. Consequently, the scope of the problems being discussed is restricted to textbook type examples. Real world problems which are usually associated with substantial data and their complex interrelationships, the analysis of which using calculators and statistical tables is not feasible, therefore tend to get excluded from the syllabus. The computational power available through CAI can be harnessed to tackle tasks related to number crunching that are so characteristic of real world problems in quantitative subjects in general and statistics

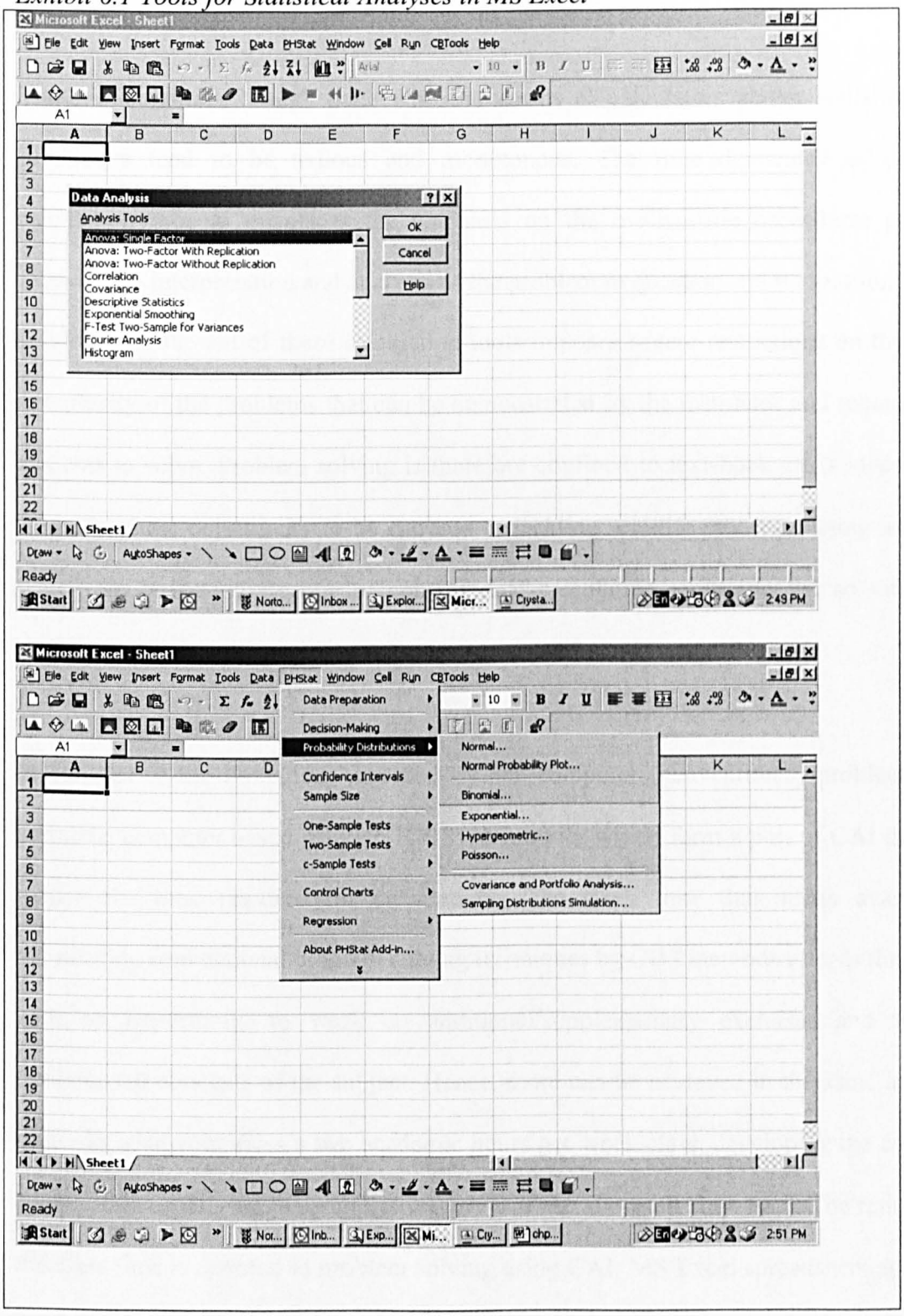
in particular, thereby allowing students time for focusing on drawing inferences and interpretation from the data analysis.

Thus, coupled with the significance of statistics in tourism management education, the extent of the scope available to CAI as a pedagogic tool in enhancing the instruction and understanding of the discipline contributed in the selection of Statistics II as a subject for this research. The fact that the instructor for this subject was also the investigator for this research was also a factor in the choice of the subject.

6.6 The Intervention Attribute

Computer Aided Instruction or CAI assumes the role of the intervention attribute in this quasi-experimental design. The term CAI is associated with the use of ICT in the teaching-learning process and as such has broad connotations. At this juncture, the context in which it has been applied to this study needs to be elaborated. In the case of Statistics II, the selected topic to be taught through CAI is initially explained from the theoretical perspective. Instances illustrating the topic's application to business and economics are discussed. From the point of view of providing the students with a historical perspective vis-à-vis the solution techniques, a standard textbook example is solved by taking recourse to conventional (non-CAI) methods. Statistical tables and/or calculators are used towards this end. In conventional problem-solving techniques, a significant proportion of the class time is allocated to calculations.

Exhibit 6.1 Tools for Statistical Analyses in MS Excel



These calculations, though done with the means of calculators and/or statistical tables, oftentimes tend to be tedious and monotonous. The time demanded of the actual calculation process misplaces the emphasis on the mechanistic procedures instead of focusing on interpretation and analysis of the problem in question and its solution. Problem solving with the aid of these calculation tools imposes severe restrictions on the level of complexity of the problems that can be demonstrated by the instructor and required of the students to solve. Problem solving is therefore confined to text-book cases, depriving the students of the opportunity to be exposed to tackling real-life problems using actual data which are beyond the scope of conventional calculation tools and yet so vital to the students' understanding of the subject and appreciation of its significance.

In contrast to the limitations imposed by non-computer (conventional) problem solving methods, computer based solution (CBS) techniques which form a part of CAI drastically reduce the time required for calculations. The slack time thus made available by substituting conventional problem solving techniques by CBS methods affords the students with an opportunity to work on additional/supplementary exercises and focus on fundamental concepts of the subject. Hence, more can be achieved in the same amount of time. In what comprises a two academic hours per week class, developing the conceptual background usually takes up approximately half the allocated class time. The remainder of the class time is devoted to problem solving using CAI. MS Excel spreadsheet application supplemented by an add-in package PHStat (Prentice Hall, 1998) is used as a tool in this context. The computer laboratory serves as the classroom for this module of the class.

familiar with spreadsheet applications by virtue of their first year syllabus in computer subjects. Essentially, the relevant functions in the application software are demonstrated from the point of view of problem solving. Students are also encouraged to apply the skills acquired in the dedicated ICT courses towards configuring the computer output in a user-friendly and presentable format. Primarily, the emphasis is placed on interpretation and analysis of the output. After the instructor's demonstration, students are required to solve a set of pre-assigned problems using the computers wherein the solution includes answers to questions that are formulated to gauge the students' ability to analyse appropriately and interpret the computer output. Students are then required to save the file containing the output and the solutions to their individual folders on the students' network drive and e-mail a confirmation copy to the instructor. Consequently, hands-on experience with ICT forms an integral part of the CAI process, thereby allowing for greater interactivity in the learning process.

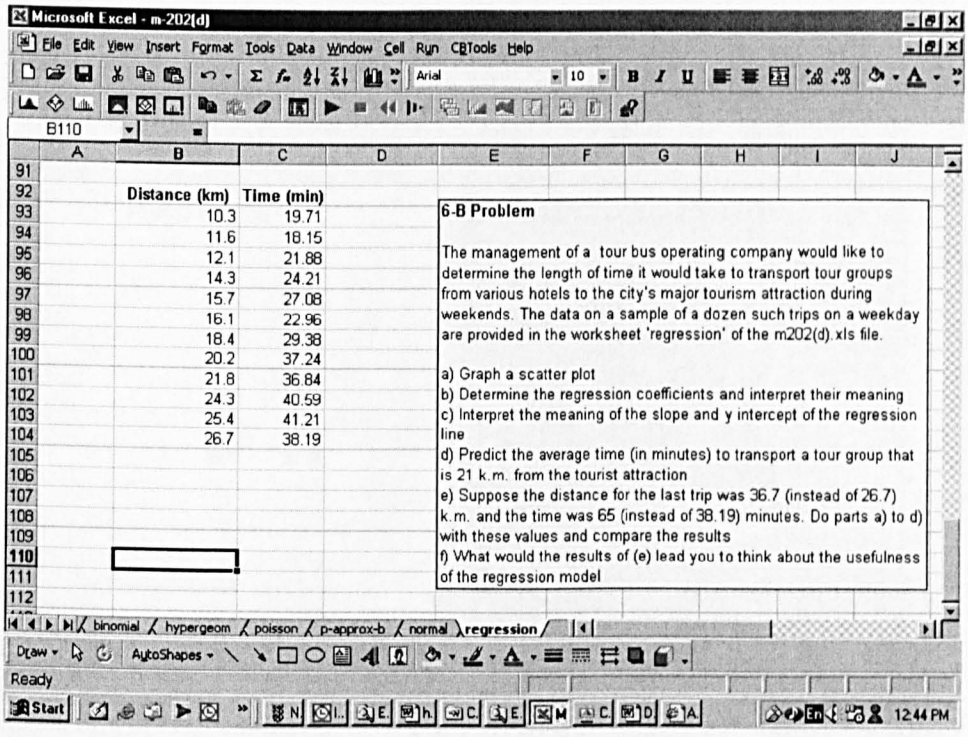
During the problem solving process, though the students work on individual workstations, they are allowed to interact with one another. From the learners' perspective, this methodology enables them to hone their problem solving skills and comprehension of the subject matter through mutual discussion and assistance without having to rely solely on the instructor. Thus, such an approach assists the students in what Vygotsky (1978) defines as the '*zone of proximal development*' in which, by virtue of the interactive support they are able to apply skills and concepts they have only partially mastered (Salomon, 1988). From the instructor's perspective, it is necessary to interact creatively with ICT as a resource and 'shape its use' (Sheingold, 1987) through the setting of '*framing tasks*' (Somekh and Davies, 1991). Thus, computer-mediated tasks are '*embedded within a wider framework of learning tasks*' (Somekh and Davis, 1999). Exhibit 6.2 provides an example.

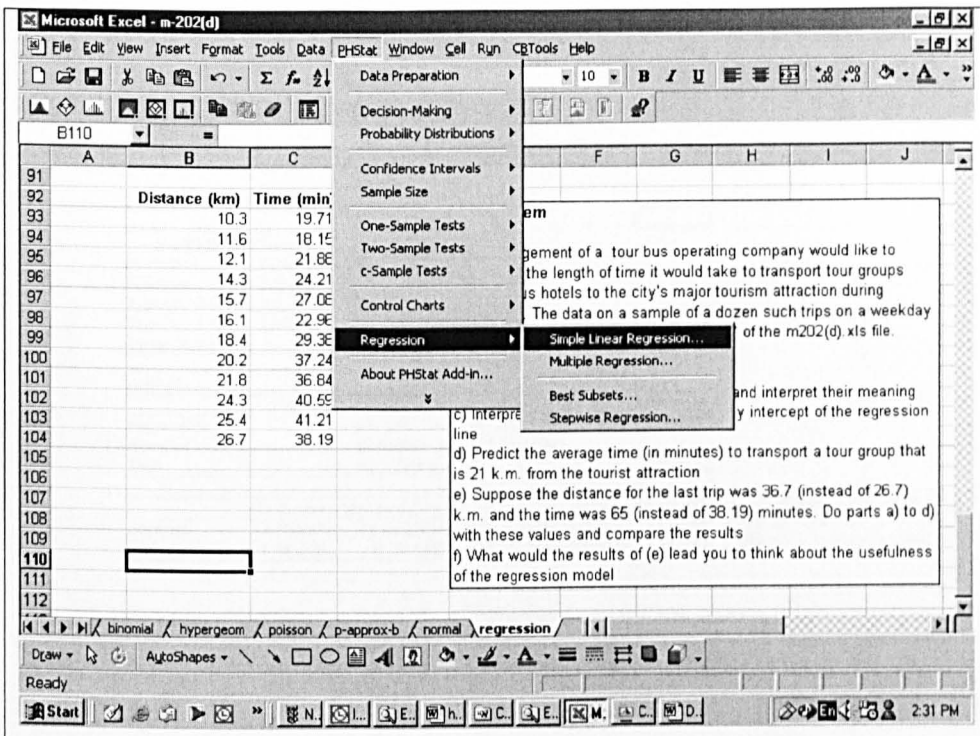
Exhibit 6.2

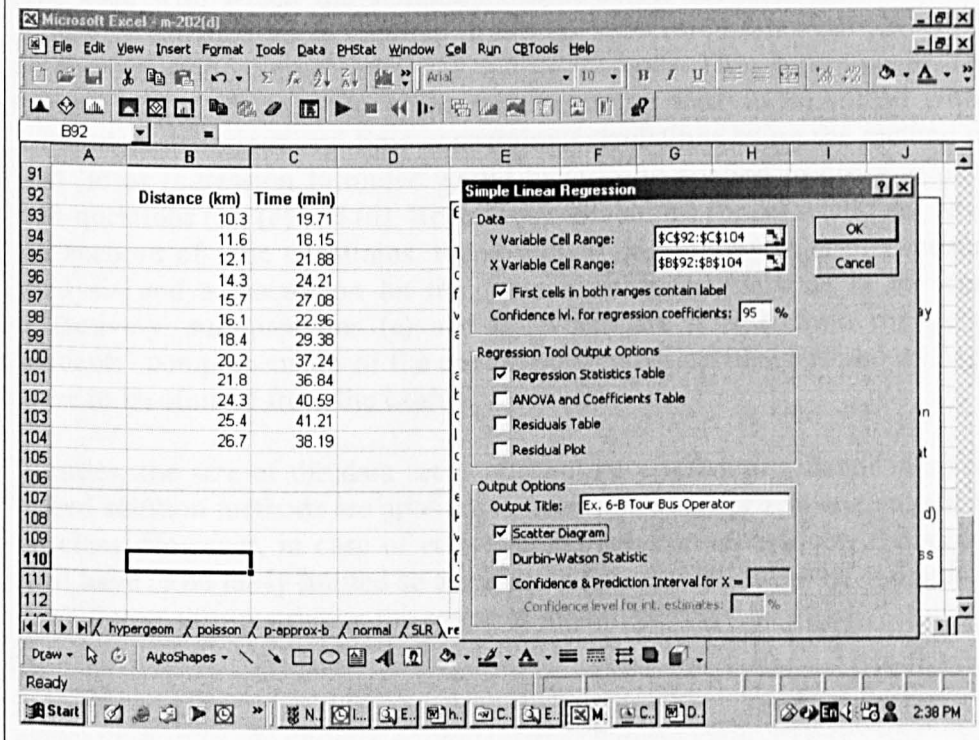
The management of a tour bus operating company would like to determine the length of time it would take to transport tour groups from various hotels to the city's major tourism attraction during weekends. The data on a sample of a dozen such trips on a weekday are provided in the worksheet 'regression' of the MS Excel file 'm202(d).xls'.

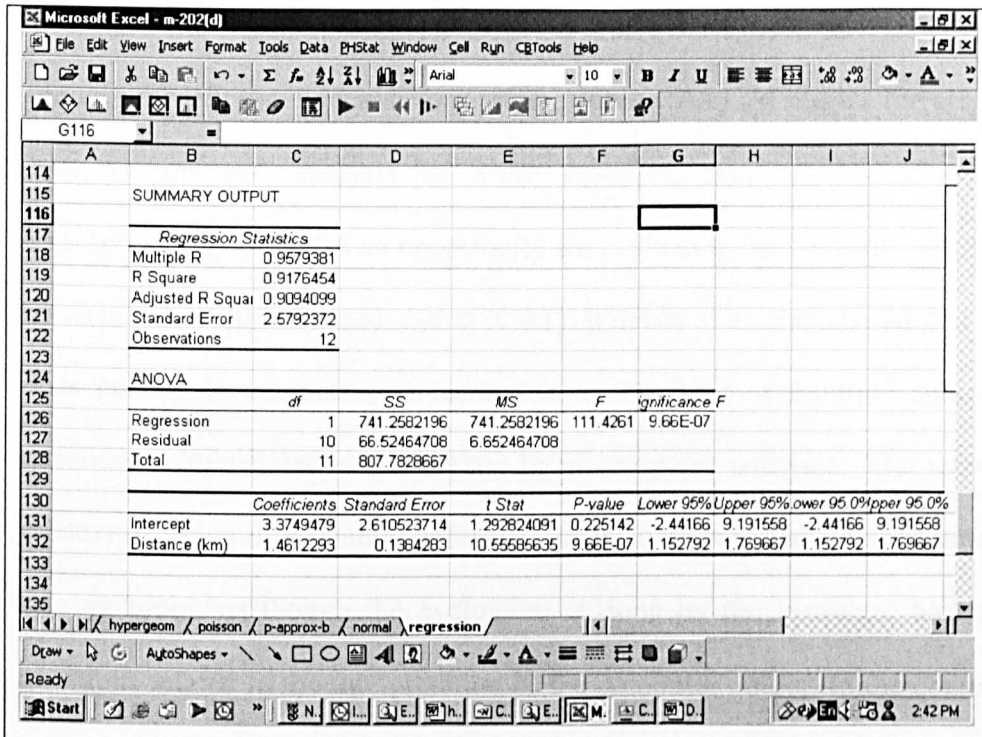
a) Graph a scatter plot
b) Determine the regression coefficients and interpret their meaning
c) Interpret the meaning of the slope and y intercept of the regression line
d) Predict the average time (in minutes) to transport a tour group that is 21 k.m. from the tourist attraction
e) Suppose the distance for the last trip was 36.7 (instead of 26.7) k.m. and the time was 65 (instead of 38.19) minutes. Do parts a) to d) with these values and compare the results
f) What would the results of (e) lead you to think about the usefulness of the regression model?

The following sequence of illustrations demonstrate the computational component of the computer based solution to the example.




Microsoft Excel - m-202(d)
File Edit View Insert Format Tools Data PHStat Window Cell Run CBTools Help
Data Preparation
Decision-Making
Probability Distributions
Confidence Intervals
Sample Size
One-Sample Tests
Two-Sample Tests
c-Sample Tests
Control Charts
Regression
About PHStat Add-In...
Simple Linear Regression...
Multiple Regression...
Best Subsets...
Stepwise Regression...
B110
Distance (km) Time (min)
10.3 19.71
11.6 18.15
12.1 21.88
14.3 24.21
15.7 27.08
16.1 22.96
18.4 29.38
20.2 37.24
21.8 36.84
24.3 40.59
25.4 41.21
26.7 38.19
gement of a tour bus operating company would like to
the length of time it would take to transport tour groups
us hotels to the city's major tourism attraction during
The data on a sample of a dozen such trips on a weekday
of the m202(d).xls file.
and interpret their meaning
y intercept of the regression
line
d) Predict the average time (in minutes) to transport a tour group that is 21 k.m. from the tourist attraction
e) Suppose the distance for the last trip was 36.7 (instead of 26.7) k.m. and the time was 65 (instead of 38.19) minutes. Do parts a) to d) with these values and compare the results
f) What would the results of (e) lead you to think about the usefulness of the regression model
binomial hypergeom poisson p-approx-b normal regression
Draw AutoShapes
Ready
Start
2:31 PM


Microsoft Excel - m-202(d)
File Edit View Insert Format Tools Data PHStat Window Cell Run CBTools Help
B92
Distance (km) Time (min)
10.3 19.71
11.6 18.15
12.1 21.88
14.3 24.21
15.7 27.08
16.1 22.96
18.4 29.38
20.2 37.24
21.8 36.84
24.3 40.59
25.4 41.21
26.7 38.19
Simple Linear Regression
Data
Y Variable Cell Range: $C$92:$C$104
X Variable Cell Range: $B$92:$B$104
First cells in both ranges contain label
Confidence lvl. for regression coefficients: 95 %
OK
Cancel
Regression Tool Output Options
Regression Statistics Table
ANOVA and Coefficients Table
Residuals Table
Residual Plot
Output Options
Output Title: Ex. 6-B Tour Bus Operator
Scatter Diagram
Durbin-Watson Statistic
Confidence & Prediction Interval for X =
Confidence level for int. estimates: %
hypergeom poisson p-approx-b normal SLR
Draw AutoShapes
Ready
Start
2:38 PM



The ease with which the summary output of the solution can be obtained allows for repetitive calculations as required in sub-question (e) of this example without much effort in comparison to conventional calculating methods. This in turn paves the way for more serious 'What if' analysis. If the same example were to be solved without the use of computers, laborious and time consuming calculations using the method of least squares and linear regression formulae would have to be applied in order to obtain answers to sub-questions (b), (c) and (d). Repetitive calculations for (e) would not have been feasible on account of time constrains, thereby depriving the students of exposure to 'What if' analysis and a discussion on the various attributes included in the computer output. Effectively, sub-questions (e) and (f) which are critical from the perspective of the students' comprehension of the concept of regression analysis and its application would have to be omitted from the example.

Besides, the size of the data set would not be a restricting factor in so far as computer based solution methods are applied, thereby allowing for real-life situations to be tackled in class. However, in case of conventional solution techniques, the size of the data set will have to be fairly limited so as to allow for calculations to be completed in the limited time frame, thus restricting the scope of the problems.

The application of CAI to a topic or set of topics in a subject also induces the necessity to suitably modify the students' evaluation process. As CAI allows for greater emphasis on interpretation and analysis of more complex than text book type problems, it correspondingly provides an opportunity for evaluating the students' abilities in this regard by virtue of computer based testing (CBT). It needs to be emphasised that CBT in this case does not imply computerised testing as in the form of multiple choice and true/false questions administered and assessed by a computer software. The term is used in the context of usage of computer software (in this case spreadsheet application) as a tool for solving problems though the evaluation is done by the instructor based on answers to questions related to the interpretation of the computer output. In the context of this study, CBT includes the usage of application software on part of the students in solving problems for evaluation purposes inclusive of submission through electronic medium as well as answering questions in a conventional paper-and-pen format based on a computer output of a given procedure (as can be seen from the last illustration of Exhibit 6.2). This extended definition of CBT has been considered due to the limitation in conducting a common exam simultaneously for both the streams that may require individual use of computers on part of the students. This limitation is a consequence of the ICT infrastructure constraints as described in Section 6.3.

The distinct advantages offered by CAI as hitherto discussed make it a worthy intervention attribute, the impact of which on students' performance merits further investigation.

6.7 Evaluation

The evaluation scheme for the four intakes is presented in Table 6.2. The basic structure of the scheme remained unchanged in that the overall assessment was made on the basis of two tests and an end of the semester final exam, the weights of which are indicated in the first row of Table 6.2. 30% of the semester's grade was allocated to a group project assignment which has been precluded from the scope of the data analysis to avoid masking effects. The topic-wise breakdown for the two tests and the final exam is as follows:

Test 1

- Types of variables
- Expected values

Test2

- Probability distributions (Binomial, Poisson, Hypergeometric and Standard Normal)

Final Exam

- Scatter diagram
- Method of least squares and the equation for linear regression
- Interpolation and extrapolation

The percentage allocated to CBT is in direct proportion to the degree of CAI applied. The extent to which CAI is applied to the topics included in the syllabus is illustrated in Table

6.3 (series a to d). In the absence of a reliable quantitative measure, the density of the shaded area is used to indicate the intensity of CAI applied. For instance, in the case of S-99, CAI was applied in teaching topics earmarked for evaluation in Test 2. This test was administered in CBT format. The same test for S-98 was administered in a dual component (CBT as well as non-CBT) format. The presence of a non-CBT (NCBT) component is indicative of the fact that CAI applied to the topics covered under Test 2 in the case of S-98 was less in extent compared to S-99. Test 1 and test 2 were conducted in class hours during the course of the semester. As the two streams are taught separately, two versions of the same test, one for each stream, having a similar level of complexity had to be arranged. The computer laboratory was used as a test venue as and when CBT was administered. The submission of answers for a CBT varied from e-mail delivery to noting down responses in the conventional paper and pen format. As per IFT's policy, in the case of non-core subjects, a common final exam has to be administered simultaneously to both the streams during the examination period at the end of the semester. As this requirement precludes the use of the computer laboratory as a test venue on account of space limitations, the CBT component was restricted to written answers to questions related to interpretation and analysis of print-outs of computer outputs of the relevant statistical procedures.

Table 6.2 Assessment Scheme

Intake (Batch)	Test 1 (20%)	Test 2 (25%)	Exam (25%)	Total* (70%)
S-97	CBT: 0% NCBT: 20% *Total: 20%*	CBT: 0% NCBT: 25% *Total: 25%*	CBT: 0% NCBT: 25% *Total: 25%*	70%
S-98	CBT: 0% NCBT: 20% *Total: 20%*	CBT: 10% NCBT: 15% *Total: 25%*	CBT: 0% NCBT: 20% *Total: 25%*	70%
S-99	CBT: 20% NCBT: 0% *Total: 20%*	CBT: 25% NCBT: 0% *Total: 25%*	CBT: 10% NCBT: 15% *Total: 25%*	70%
S-00	CBT: 20% NCBT: 0% *Total: 20%*	CBT: 25% NCBT: 0% *Total: 25%*	CBT: 15% NCBT: 10% *Total: 25%*	70%

* Excludes group project which carries 30% weight

Tables 6.3-a to 6.3-d: Intake-wise infusion of CAI into Statistics II syllabus

Table 6.3-a S-97

Topics	**Time Allocation***
Application of Probability Theory	
• Types of variables	10%
• Expected values	25%
• Probability distributions (Binomial, Poisson, Hypergeometric and Standard Normal)	35%
Regression	
• Scatter diagram	5%
• Method of least squares and the equation for linear regression	15%
• Interpolation and extrapolation	10%

* Time allocated to teaching which excludes consultation periods and test hours

Table 6.3-b S-98

Topics	Time Allocation*
Application of Probability Theory	
• Types of variables	10%
• Expected values	25%
• Probability distributions (Binomial, Poisson, Hypergeometric and Standard Normal)	35%
Regression	
• Scatter diagram	5%
• Method of least squares and the equation for linear regression	15%
• Interpolation and extrapolation	10%

* Time allocated to teaching which excludes consultation periods and test hours

Table 6.3-c S-99

Topics	Time Allocation*
Application of Probability Theory	
• Types of variables	10%
• Expected values	25%
• Probability distributions (Binomial, Poisson, Hypergeometric and Standard Normal)	35%
Regression	
• Scatter diagram	5%
• Method of least squares and the equation for linear regression	15%
• Interpolation and extrapolation	10%

* Time allocated to teaching which excludes consultation periods and test hours

Table 6.3-d S-00

Topics	Time Allocation*
Application of Probability Theory	
• Types of variables	10%
• Expected values	25%
• Probability distributions (Binomial, Poisson, Hypergeometric and Standard Normal)	35%
Regression	
• Scatter diagram	5%
• Method of least squares and the equation for linear regression	15%
• Interpolation and extrapolation	10%

* Time allocated to teaching which excludes consultation periods and test hours

6.8 Procurement and Calibration of Grades

The dependent variable in this research was the students' performance in Statistics II. The instructor who was also the investigator kept records of the students' scores in the subject for all the four intakes. For the purpose of data analyses, the students' scores that were considered excluded the component for the group project. As indicated in Table 6.2, marks in the two tests and the final exam totalling to 70% of the semester's grade were taken into consideration. These scores were then converted to percentages during data analysis. The exclusion of the students' performance on the group project was done in order to eliminate potential masking effects that could contaminate the outcome.

So as to establish a baseline for all the four intakes, it was necessary to procure the students' cumulative GPAs until the end of the first semester of the second academic year. A request to this effect was conveyed to the IFT Registry which obliged under the condition that the identities of the students corresponding to their GPA score would not be displayed in the data set in compliance with privacy regulations and that the data be used solely for the research purposes as indicated in the request.

Apropos the discussions in Section 2.4 of Chapter 2, the weight allocated to non-core subjects is higher for the Tourism stream in comparison with the Hotel stream. With the objective of investigating whether this difference in the distribution of weights between the two majors has an influence on the students' overall performance in non-core subjects, the

cumulative GPAs or average percentage scores in all the non-core subjects up to any given year of study of the students in the hotel stream would have had to be compared with those of students in the tourism stream. However, on account of the limitations of the student information database system currently in operation at IFT, the Registry was unable to provide the data in the required format. In its existing configuration, this database is capable of providing only the total cumulative GPAs of students. There is no provision for segregating between core and non-core subjects. In the absence of availability of GPAs in non-core subjects, the research question therefore had to be restricted to exploring the differences in performance between the students of the two streams in one of the non-core subjects, namely Statistics II, the outcome of which is discussed in Section 6.12. As such, the Registry provided the GPAs as well as the final grades in Statistics II. A letter of authentication to this effect is provided in Appendix 4.

6.9 Procedure

The extent of CAI to which each intake was subjected is shown in the extreme right column of Table 6.1. S-97 had no exposure to CAI and were taught the course in a conventional classroom situation. Theoretical concepts were explained in the standard chalk and talk format and calculators and statistical tables were used for problem-solving sessions. CAI was introduced to S-98 whilst studying the concept of expected values and probability distributions. Contingency tables for expected monetary value and opportunity loss were generated using PHStat add-in. In terms of weight allocation, CAI comprised

10% of the total grade for the semester. The extent of CAI was enhanced to 55% for S-99. Elements of CAI were introduced in varying degrees for all the topics covered in the syllabus. For S-00, CAI was the principal method used in delivering the course. However, as explained in the Section 6.6, for the sake of completeness, the usage of conventional problem-solving techniques was also demonstrated for select topics.

As shown in Table 6.2, the weight of the CBT in the evaluation was commensurate with the extent of CAI applied to the given intake. Students' scores in the two tests as well as final exams were recorded for all the four intakes. The impact of the intervention attribute was monitored longitudinally across the four intakes. It needs to be emphasised at this juncture that the investigator was also the subject lecturer and *ipso facto*, a participant in this empirical study. This dual identity allowed for a structured and coherent processing of inputs vis-à-vis the situational analysis apropos the syllabus, infrastructure and profile of the student body that eventually contributed in the formulation of the empirical design that was adopted in this study as well as facilitated its implementation phase. The procedure of consulting the course coordinators for the two streams, hotel and tourism (subsequently re-titled academic coordinator overseeing both the streams) to moderate the outcome of the assessment modules (tests and exams) minimised the potential for any bias on account of this dual identity during the length of the investigation.

Based on the scope of the study, a set of research questions were formulated and subsequently translated into hypotheses. As is discussed in the following sections, appropriate statistical methods were adopted using SPSS version 10 to test these hypotheses and arrive at inferences apropos the assessment of the impact of CAI on students' grades in Statistics II.

6.10 Baseline

The cases (students) in these four intakes can be assumed to belong to the same population as the selection criteria (entrance examinations and interviews) for being admitted to the IFT degree programme were essentially identical for all the four intakes. However, so as to strengthen the basis of this assumption by precluding the possibility of any given batch (intake) of students being better than the other/s in terms of academic achievement, a baseline measure was accorded to all the four intakes. This measure was characterised by the mean of the cumulative grade point averages (GPA) until the end of the first semester of the second academic year (i.e. prior to commencing the semester in which Statistics II was taught) for each of the intakes. The means of the cumulative GPAs of the four intakes were tested for differences in hypothesis 6.5

The variable which represents the GPAs is of the ratio/interval type. In order to convincingly apply parametric tests to the mean cumulative GPAs, it is *sine qua non* to establish that the cumulative GPAs of the students of each of the four intakes belong to a normally distributed population and that the variances are homogenous. This assumption of normality is tested in hypotheses 6.1 to 6.4 using the One-Sample Kolmogorov-Smirnov test.

6.1 H_0: The cumulative GPAs of the students belonging to the S-97 intake belong to a normally distributed data set.

H_1: The grades of the students belonging to the S-97 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Year 1 GPA
N		65
Normal Parameters	Mean	2.2218
	Std. Deviation	.40173
Most Extreme Differences	Absolute	.051
	Positive	.046
	Negative	-.051
Kolmogorov-Smirnov Z		.412
Asymp. Sig. (2-tailed)		.996

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.2 H_0: The cumulative GPAs of the students belonging to the S-98 intake belong to a normally distributed data set.

H_1: The grades of the students belonging to the S-98 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Year 1 GPA
N		37
Normal Parameters	Mean	2.1822
	Std. Deviation	.44967
Most Extreme Differences	Absolute	.105
	Positive	.105
	Negative	-.064
Kolmogorov-Smirnov Z		.641
Asymp. Sig. (2-tailed)		.806

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.3 H_0: The cumulative GPAs of the students belonging to the S-99 intake belong to a normally distributed data set.

H_1: The grades of the students belonging to the S-99 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Year 1 GPA
N		31
Normal Parameters	Mean	2.0910
	Std. Deviation	.40929
Most Extreme Differences	Absolute	.101
	Positive	.101
	Negative	-.065
Kolmogorov-Smirnov Z		.563
Asymp. Sig. (2-tailed)		.909

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.4 H_0: The cumulative GPAs of the students belonging to the S-00 intake belong to a normally distributed data set.

H_1: The grades of the students belonging to the S-00 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Year 1 GPA
N		57
Normal Parameters	Mean	2.2216
	Std. Deviation	.40463
Most Extreme Differences	Absolute	.054
	Positive	.054
	Negative	-.051
Kolmogorov-Smirnov Z		.407
Asymp. Sig. (2-tailed)		.996

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.5 H_0: There is no difference between the mean cumulative GPAs (prior to commencing the second academic year) of the four intakes S-97, S-98, S-99 and S-00.

H_1: The mean cumulative GPAs for the S-97, S-98, S-99 and S-00 intakes are significantly different from one-another.

Descriptives
Year 1 GPA

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
S-97	65	2.2218	.40173	.04983	2.1223	2.3214	1.46	3.19
S-98	37	2.1822	.44967	.07392	2.0322	2.3321	1.40	3.30
S-99	31	2.0910	.40929	.07351	1.9408	2.2411	1.47	3.14
S-00	57	2.2216	.40463	.05359	2.1142	2.3289	1.44	3.17
Total	190	2.1927	.41295	.02996	2.1336	2.2518	1.40	3.30

Test of Homogeneity of Variances
Year 1 GPA

Levene Statistic	df1	df2	Sig.
.171	3	186	.916

At the p = 0.05 level, Levene's test indicates that the variances of the batches S-97, S-98, S-99 and S-00 are not significantly different. This condition being satisfied, the analysis of variance (ANOVA) procedure can be applied to the mean cumulative GPAs of the four intakes.

ANOVA
Year 1 GPA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.428	3	.143	.834	.477
Within Groups	31.802	186	.171		
Total	32.230	189			

The ANOVA yields a result of F(3, 186) = 0.834, p = 0.477 which is not significant at the p = 0.05 level, thereby suggesting that there is no statistically significant difference in the mean cumulative GPAs of the S-97, S-98, S-99 and S-00 intakes. Thus, on the premise that the omnibus F is not significant, the null hypothesis is accepted.

6.11 Normality of the students' grades in STATISTICS II

As mentioned in the preceding section, parametric tests can be performed more convincingly on a ratio/interval type variable provided it can be assumed that the data values are normally distributed. Before proceeding with the relevant parametric tests on the students' scores, it is therefore imperative to verify whether the data set conforms to this assumption. Hypotheses 6.6 to 6.11 assess the assumption that the scores in Statistics II of students grouped in accordance with their major and subsequently, their year of intake, belong to an underlying normal distribution. The One-Sample Kolmogorov-Smirnov procedure was used to test the validity of this assumption.

6.6 H_0: The grades of the students majoring in hospitality management (BH group) belong to a normally distributed data set.

H_1: The grades of the students majoring in hospitality management (BH group) are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Grade
N		100
Normal Parameters	Mean	57.98
	Std. Deviation	17.318
Most Extreme Differences	Absolute	.064
	Positive	.058
	Negative	-.064
Kolmogorov-Smirnov Z		.640
Asymp. Sig. (2-tailed)		.807

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.7 H_0: The grades of the students majoring in tourism management (BT group) belong to a normally distributed data set.

H_1: The grades of the students majoring in tourism management (BT group) are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Grade
N		90
Normal Parameters	Mean	58.92
	Std. Deviation	14.807
Most Extreme Differences	Absolute	.089
	Positive	.069
	Negative	-.089
Kolmogorov-Smirnov Z		.847
Asymp. Sig. (2-tailed)		.470

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.8 H_0: The grades of the students of the S-97 intake belong to a normally distributed data set.

H_1: The grades of the students of the S-97 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Grade
N		65
Normal Parameters	Mean	54.65
	Std. Deviation	15.399
Most Extreme Differences	Absolute	.109
	Positive	.101
	Negative	-.109
Kolmogorov-Smirnov Z		.881
Asymp. Sig. (2-tailed)		.419

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.9 H_0: The grades of the students of the S-98 intake belong to a normally distributed data set.

H_1: The grades of the students of the S-98 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Grade
N		37
Normal Parameters	Mean	53.16
	Std. Deviation	15.699
Most Extreme Differences	Absolute	.110
	Positive	.105
	Negative	-.110
Kolmogorov-Smirnov Z		.670
Asymp. Sig. (2-tailed)		.761

a Test distribution is Normal.
b Calculated from data.

At the $p = 0.05$ level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.10 H_0: The grades of the students of the S-99 intake belong to a normally distributed data set.

H_1: The grades of the students of the S-99 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Grade
N		31
Normal Parameters	Mean	63.21
	Std. Deviation	16.178
Most Extreme Differences	Absolute	.075
	Positive	.075
	Negative	-.048
Kolmogorov-Smirnov Z		.415
Asymp. Sig. (2-tailed)		.995

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

6.11 H_0: The grades of the students of the S-00 intake belong to a normally distributed data set.

H_1: The grades of the students of the S-00 intake are not derived from a normally distributed data set.

One-Sample Kolmogorov-Smirnov Test

		Grade
N		57
Normal Parameters	Mean	63.54
	Std. Deviation	15.347
Most Extreme Differences	Absolute	.100
	Positive	.056
	Negative	-.100
Kolmogorov-Smirnov Z		.754
Asymp. Sig. (2-tailed)		.620

a Test distribution is Normal.
b Calculated from data.

At the p = 0.05 level of significance, no significant difference is observed. Therefore the null hypothesis is retained.

Inference: The outcome of testing hypotheses 6.6 to 6.11 indicates that the students' scores in Statistics II as factored with respect to their major as well as year of intake are indeed normally distributed. This inference allows for the application of powerful parametric techniques (which require that the underlying test variable be normally distributed) to these sets of students' scores in Statistics II to compare their performance characteristics.

6.12 Towards exploring differences in the performance of students factored with respect to their major of study

The test variable, which in this case is the mean grade (score) for a given group, can be considered to be a valid measure of central tendency since the set of grades represents a ratio-interval scale (distance between all scale values is equal). Also, as demonstrated in the preceding section, the assumptions of normality are satisfied. Therefore, parametric procedures designed to test for significant differences between the groups can be convincingly applied to this test variable.

The scope of the hypotheses 6.12 to 6.16 is to ascertain whether or not there are significant differences in the mean scores in Statistics II of students majoring in hotel management and those of students majoring in tourism management. Hypothesis 6.12 explores this question across all intakes whilst hypotheses 6.13 to 6.16 examine the differences in scores between the two majors on an intake-by-intake basis.

6.12 H_0: There is no difference between the mean scores in Statistics II of students majoring in hotel management and those majoring in tourism management, considered collectively for the S-97, S-98, S-99 and S-00 intakes.

H_1: The mean score in Statistics II considered collectively for the S-97, S-98, S-99 and S-00 intakes in the case of the hotel major students differs from that of the tourism major students.

Group Statistics

	Major	N	Mean	Std. Deviation	Std. Error Mean
Grade	Hotel	100	57.98	17.318	1.732
	Tourism	90	58.92	14.807	1.561

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	3.611	.059	-.398	188	.691	-.94	2.351	-5.574	3.700
	Equal variances not assumed			-.402	187.522	.688	-.94	2.331	-5.536	3.662

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(188) = -0.398, p = 0.691 is not significant at the p = 0.05 level. Consequently, the null hypothesis is retained.

6.13 H_0: There is no difference between the mean scores in Statistics II of students majoring in hotel management and those majoring in tourism management for the S-97 batch.

H_1: For the S-97 batch, the mean score in Statistics II in the case of the hotel major students differs from that of the tourism major students.

Group Statistics

	Major	N	Mean	Std. Deviation	Std. Error Mean
Grade	Hotel	33	55.55	15.528	2.703
	Tourism	32	53.72	15.457	2.732

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.242	.624	.475	63	.636	1.83	3.844	-5.855	9.508
	Equal variances not assumed			.475	62.955	.636	1.83	3.844	-5.854	9.508

Levene's F is not statistically significant at the $p = 0.05$ level. Hence, equal variances can be assumed. Therefore, $t(63) = 0.475$, $p = 0.636$ is not significant at the $p = 0.05$ level. Consequently, the null hypothesis is retained.

6.14 H_0: There is no difference between the mean scores in Statistics II of students majoring in hotel management and those majoring in tourism management for the S-98 batch.

H_1: For the S-98 batch, the mean score in Statistics II in the case of the hotel major students differs from that of the tourism major students.

Group Statistics

	Major	N	Mean	Std. Deviation	Std. Error Mean
Grade	Hotel	19	49.26	18.150	4.164
	Tourism	18	57.28	11.756	2.771

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	6.179	.018	-1.584	35	.122	-8.01	5.059	-18.285	2.255
	Equal variances not assumed			-1.602	31.030	.119	-8.01	5.002	-18.215	2.186

Levene's F is statistically significant at the p = 0.05 level. Hence, equal variances cannot be assumed. Despite unequal variances, t(35) = -1.584, p = 0.199 is still not significant at the p = 0.05 level. Consequently, the null hypothesis is retained. This anomaly (unequal variances) could be attributable to the small sample sizes in the S-98 intake.

6.15 H_0: There is no difference between the mean scores in Statistics II of students majoring in hotel management and those majoring in tourism management for the S-99 batch.

H_1: For the S-99 batch, the mean score in Statistics II in the case of the hotel major students differs from that of the tourism major students.

Group Statistics

	Major	N	Mean	Std. Deviation	Std. Error Mean
Grade	Hotel	19	67.11	16.160	3.707
	Tourism	12	57.04	14.791	4.270

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.202	.656	1.743	29	.092	10.06	5.772	-1.742	21.870
	Equal variances not assumed			1.780	25.116	.087	10.06	5.655	-1.580	21.707

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(29) = 1.743, p = 0.092 is not significant at the p = 0.05 level. Consequently, the null hypothesis is retained.

6.16 H_0: There is no difference between the mean scores in Statistics II of students majoring in hotel management and those majoring in tourism management for the S-00 batch.

H_1: For the S-00 batch, the mean score in Statistics II in the case of the hotel major students differs from that of the tourism major students.

Group Statistics

	Major	N	Mean	Std. Deviation	Std. Error Mean
Grade	Hotel	29	60.48	16.843	3.128
	Tourism	28	66.71	13.185	2.492

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	3.836	.055	-1.552	55	.126	-6.23	4.016	-14.280	1.817
	Equal variances not assumed			-1.558	52.775	.125	-6.23	3.999	-14.253	1.790

Levene's F is not statistically significant at the $p = 0.05$ level. Hence, equal variances can be assumed. Therefore, $t(55) = -1.552$, $p = 0.126$ is not significant at the $p = 0.05$ level. Consequently, the null hypothesis is retained.

Inference: The results of tests on hypotheses 6.12 to 6.16 show no significant differences in the performance characteristics between students of the two majors in Statistics II. The significance of this conclusion is that besides validating the approach adopted in Design B,

the major of study is not an issue as far as students' performance in non-core subjects like Statistics II is concerned.

6.13 Towards exploring differences in the performance of students factored with respect to their year of intake

The conclusions arrived at in the preceding section make it possible to explore the differences between the four intakes S-97, S-98, S-99 and S-00 in terms of the students' performance in Statistics II, without having to distinguish between the BH and BT streams for any given intake. Thus, an inter-intake comparison is made, wherein each intake has a pre-defined magnitude of the intervention attribute so as to gauge its influence on students' performance. The analysis of variance (ANOVA) technique was applied to test hypothesis 6.17. The outcome of hypothesis 6.17 was cross-validated by testing hypotheses 6.18 to 6.23 using the independent sample t tests.

6.17 H_0: There is no difference between the mean scores in Statistics II of students belonging to the S-97, S-98, S-99 and S-00 intakes.

H_1: There are differences between the mean scores in Statistics II of students belonging to the S-97, S-98, S-99 and S-00 intakes.

Descriptives
Grade

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
S-97	65	54.65	15.399	1.910	50.83	58.46	29	90
S-98	37	53.16	15.699	2.581	47.93	58.40	27	88
S-99	31	63.21	16.178	2.906	57.28	69.14	34	96
S-00	57	63.54	15.347	2.033	59.47	67.62	30	88
Total	190	58.42	16.142	1.171	56.11	60.73	27	96

Test of Homogeneity of Variances
Grade

Levene Statistic	df1	df2	Sig.
.040	3	186	.989

At the p = 0.05 level, Levene's test indicates that the variances of the batches S-97, S-98, S-99 and S-00 are not significantly different. This condition being satisfied, the ANOVA procedure can be performed on the mean scores of the four batches in Statistics II.

ANOVA
Grade

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4156.227	3	1385.409	5.715	.001
Within Groups	45092.041	186	242.430		
Total	49248.268	189			

The ANOVA yields a result of F(3, 186) = 5.715, p = 0.001 which is significant at the p = 0.05 level, thereby suggesting a statistically significant difference in the mean scores in Statistics II of students belonging to the S-97, S-98, S-99 and S-00 intakes. Thus, on the premise that the omnibus F is significant, the null hypothesis is rejected.

So as to gauge which specific mean scores are different from which other ones, the data set was subjected to LSD post hoc test. Given the differences in the size of the intakes, a

liberal post hoc analysis using the LSD test was preferred over the more conservative tests viz. Tukey test or Scheffe test which rely on the harmonic means of the group size, thereby not guaranteeing Type 1 error levels.

Post Hoc Test
Multiple Comparisons
Dependent Variable: Grade
LSD

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Batch(year)	(J) Batch(year)				Lower Bound	Upper Bound
S-97	S-98	1.48	3.207	.644	-4.84	7.81
	S-99	-8.56	3.399	.013	-15.27	-1.86
	S-00	-8.90	2.825	.002	-14.47	-3.32
S-98	S-97	-1.48	3.207	.644	-7.81	4.84
	S-99	-10.05	3.791	.009	-17.53	-2.57
	S-00	-10.38	3.287	.002	-16.87	-3.90
S-99	S-97	8.56	3.399	.013	1.86	15.27
	S-98	10.05	3.791	.009	2.57	17.53
	S-00	-.33	3.475	.923	-7.19	6.52
S-00	S-97	8.90	2.825	.002	3.32	14.47
	S-98	10.38	3.287	.002	3.90	16.87
	S-99	.33	3.475	.923	-6.52	7.19

As the results of the LSD post hoc test indicate, at the $p = 0.05$ level, the mean score of intake S-97 differs significantly from those of intakes S-99 and S-00. Ditto for intake S-98. No significant differences are observed between the average scores of intake S-97 and S-98. Ditto for S-99 and S-00.

The following hypotheses were tested using the independent sample t test to validate the outcome of the ANOVA analysis and the subsequent post hoc LSD test.

6.18 H_0: There is no difference between the mean scores of S-97 and S-98 batches in Statistics II.

H_1: The mean score in Statistics II of the S-97 batch differs from that of the S-98 batch.

Group Statistics

	Batch(year)	N	Mean	Std. Deviation	Std. Error Mean
Grade	S-97	65	54.65	15.399	1.910
	S-98	37	53.16	15.699	2.581

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.020	.887	.465	100	.643	1.48	3.194	-4.852	7.820
	Equal variances not assumed			.462	73.782	.645	1.48	3.211	-4.914	7.882

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(100) = 0.466, p = 0.643 is not significant at the p = 0.05 level. Consequently, the null hypothesis is retained.

6.19 H_0: There is no difference between the mean scores of S-97 and S-99 batches in Statistics II.

H_1: The mean score in Statistics II of the S-97 batch differs from that of the S-99 batch.

Group Statistics

	Batch(year)	N	Mean	Std. Deviation	Std. Error Mean
Grade	S-97	65	54.65	15.399	1.910
	S-99	31	63.21	16.178	2.906

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.064	.801	-2.507	94	.014	-8.56	3.416	-15.347	-1.780
	Equal variances not assumed			-2.463	56.576	.017	-8.56	3.477	-15.528	-1.599

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(94) = -2.507, p = 0.014 is significant at the p = 0.05 level. Consequently, the null hypothesis is rejected.

6.20 H_0: There is no difference between the mean scores of S-97 and S-00 batches in Statistics II.

H_1: The mean score in Statistics of the S-97 batch differs from that of the S-00 batch.

Group Statistics

	Batch(year)	N	Mean	Std. Deviation	Std. Error Mean
Grade	S-97	65	54.65	15.399	1.910
	S-00	57	63.54	15.347	2.033

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.007	.932	-3.189	120	.002	-8.90	2.790	-14.422	-3.374
	Equal variances not assumed			-3.190	118.031	.002	-8.90	2.789	-14.421	-3.374

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(120) = -3.189, p = 0.002 is significant at the p = 0.05 level. Consequently, the null hypothesis is rejected.

6.21 H_0: There is no difference between the mean scores of S-98 and S-99 batches in Statistics II.

H_1: The mean score in Statistics II of the S-98 batch differs from that of the S-99 batch.

Group Statistics

	Batch(year)	N	Mean	Std. Deviation	Std. Error Mean
Grade	S-98	37	53.16	15.699	2.581
	S-99	31	63.21	16.178	2.906

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.012	.914	-2.592	66	.012	-10.05	3.876	-17.786	-2.309
	Equal variances not assumed			-2.585	63.219	.012	-10.05	3.886	-17.813	-2.282

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(66) = -2.592, p = 0.012 is significant at the p = 0.05 level. Consequently, the null hypothesis is rejected.

6.22 H_0: There is no difference between the mean scores of S-98 and S-00 batches in Statistics II.

H_1: The mean score in Statistics II of the S-98 batch differs from that of the S-00 batch.

Group Statistics

	Batch(year)	N	Mean	Std. Deviation	Std. Error Mean
Grade	S-98	37	53.16	15.699	2.581
	S-00	57	63.54	15.347	2.033

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.044	.834	-3.175	92	.002	-10.38	3.269	-16.875	-3.888
	Equal variances not assumed			-3.160	75.772	.002	-10.38	3.285	-16.925	-3.838

Levene's F is not statistically significant at the p = 0.05 level. Hence, equal variances can be assumed. Therefore, t(92) = -3.275, p = 0.002 is significant at the p = 0.05 level. Consequently, the null hypothesis is rejected.

6.23 H_0: There is no difference between the mean scores of S-99 and S-00 batches in Statistics II.

H_1: The mean score in Statistics II of the S-99 batch differs from that of the S-00 batch.

Group Statistics

	Batch(year)	N	Mean	Std. Deviation	Std. Error Mean
Grade	S-99	31	63.21	16.178	2.906
	S-00	57	63.54	15.347	2.033

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grade	Equal variances assumed	.098	.754	-.096	86	.924	-.33	3.491	-7.274	6.605
	Equal variances not assumed			-.094	58.983	.925	-.33	3.546	-7.430	6.762

Levene's F is not statistically significant at the $p = 0.05$ level. Hence, equal variances can be assumed. Therefore, $t(86) = -0.096$, $p = 0.924$ is not significant at the $p = 0.05$ level. Consequently, the null hypothesis is retained.

Inference: As described in Section 6.9, the CAI component in the Statistics II syllabus was defined as the independent variable which was increased progressively from 0% for the S-97 intake to 70% for the S-00 intake. The effects of CAI begin to manifest themselves on the students' performance as the intervention attribute exceeds 55% in magnitude.

6.14 Discussion & Conclusions

By virtue of the dependent variable (i.e. students' grades) being of the interval/ratio type, it was possible to consider the use of parametric tests in order to address the research

questions posed in the second column of Table 6.4, subject to the dependent variable also satisfying the assumptions of normality and homogeneity of variances (Bryman and Cramer, 1997). There has been considerable debate in literature on the requirement to satisfy these conditions for applying parametric tests. For instance, studies carried out by Boneau (1960) and Games and Lucas (1966) suggest that the outcome of parametric tests on samples drawn from populations that violate these norms did not differ greatly from that of samples drawn from populations satisfying the conditions of normality and homogeneity of variances. In so far as this investigation is concerned, all the hypotheses were tested at a statistical significance level of 5% ($p = 0.05$). The dependent variable was subjected to suitable statistical tests to check whether these conditions were satisfied. As illustrated in the first and third items of Table 6.4, the students' cumulative GPAs which were used in defining the baseline as well as their scores in Statistics II met the conditions of normality and equality of variances. These checks were performed so as to eliminate any ambiguity on the appropriateness of applying parametric tests to the data set, thereby allowing for the mean to be recognised as a true measure of central tendency. Table 6.4 provides a synopsis of the hypothesis tests performed in sections 6.10 to 6.13.

As was pointed out in Section 6.2, in absence of the random distribution of students into groups, the design for this investigation can be construed to be of a quasi-experimental type. In order to minimise the potential repercussions on the inferences of this investigation precipitated by the lack of randomness in shaping the groups that were studied, it was necessary to propound a baseline that would establish a 'level playing field' for all the four intakes before their commencing studying Statistics II in the second semester of the second academic year of the programme. The second item in Table 6.4 addresses this issue. As no significant differences were found in the means of the

cumulative GPAs between the four intakes, there are no grounds to suggest that any given intake was different from the rest in terms of academic achievement. Moreover, the fact that the selection criteria for all the four intakes were identical furthermore reduces the possibility of such differences. Thus, all the four intakes were on a 'level playing field' vis-à-vis their academic achievement prior to commencing studying Statistics II in which the intervention attribute was introduced. This negates the possibility of a better/worse performance in Statistics II of any given intake being attributable to it being inherently more/less 'intelligent' that the others, thereby eliminating the possible influence of previous academic achievement as a mediating factor on the outcome of this investigation.

In Section2.4 of Chapter 2, the differences in the curricular structure of the hotel and tourism programmes were highlighted wherein it was observed that the students in the hotel major are subjected to a higher number of core courses than their counterparts in the tourism major. As the outcome in the fourth item of Table 6.4 suggests, no significant differences in performance for a non-core subject like Statistics II were observed between the students of the two streams. Though there are insufficient grounds to extrapolate this conclusion to other non-core subjects, this outcome does lend further credence to the arguments put forth in Chapter 2 that there be no distinction made between hospitality and tourism management programmes despite the differences in their curricular structure with respect to distribution of core and non-core subjects. On the strength of these arguments, the generic disciplines of the APETIT member-institutions' curricula were compared without differentiation between hotel management and tourism management programmes in Chapter 3. Also, the outcome allows for comparison of any two intakes with respect to the students' performance in Statistics II to be made without having to differentiate between the two streams BH and BT. This implies that there are no intra-stream

four intakes under study, thereby validating the approach adopted in Design B which is discussed in Section 6.2. Besides, combining the two streams in a given intake also mitigates the problem of small sample sizes.

Table 6.4 Summary of results on the influence of CAI

Item No.	***Research Question***	***Test & Hypothesis***	***Inference & Implications***
1	Can the cumulative GPAs of the students belonging to the four intakes S-97, S-98, S-99 and S-00 be construed to belong to a normally distributed population?	One sample Kolmogorov-Simrnov test No.: 6.1 to 6.4	Yes. *Ipso facto*, parametric tests can be performed on these data.
2	Is there a statistically significant difference between the means of the cumulative GPAs for the four intakes?	One-way ANOVA No.: 6.5	No. Hence, it may be assumed that the level of academic achievement was similar for the four intakes prior to the intervention treatment
3	Can the students' grades in Statistics II classified according to their major of study and year of intake be construed to belong to a normally distributed population?	One sample Kolmogorov-Simrnov test No.: 6.6 to 6.11	Yes. *Ipso facto*, parametric tests can be performed on these data.
4	Is the performance in Statistics II of the students majoring in Tourism significantly different from those majoring in Hotel across the four intakes?	Independent samples t-test No.: 6.12 to 6.16	No. The differences in their curricular structure bear no influence on their performance in a non-core subject like Statistics II, thereby making inter-intake comparisons possible
5	Does CAI, as an intervention attribute, bear an influence on the students' grades in Statistics II?	One-way ANOVA & Independent samples t-test No.: 6.17 to 6.23	Yes. The intervention attribute, when administered in sufficient magnitude, does influence students' grades in Statistics II.

The first four items of Table 6.4 were focussed on preparing the backdrop to explore the core issue of this investigation i.e. the influence of the intervention attribute CAI on the

performance of the students in Statistics II. The fifth item addresses this core issue. As illustrated in Table 6.1, the extent of the intervention attribute was increased in magnitude from 0% to 70% sequentially on an annual basis during the length of the experiment. For S-98 wherein the magnitude of CAI was 10%, no significant difference in the students' performance in Statistics II was observed with respect to the preceding intake. However, with a sizable increase of CAI to 55% for the subsequent intake S-99, a significant upswing in the students' scores was noted. Intensifying the extent of CAI applied in the syllabus to 70% in the case of S-00, there was no significant difference in the students' performance in relation to the preceding intake. Consistent with the outcome of the comparison of S-99 with S-98 and S-97, students belonging to S-00 outperformed their counterparts from S-97 and S-98.

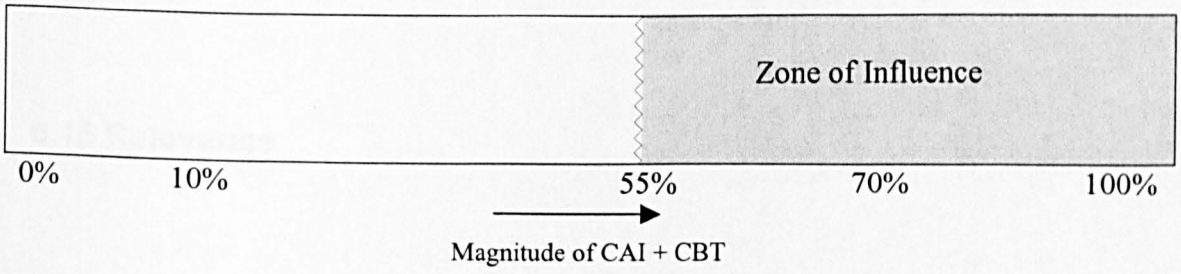
Based on these observations, it can be inferred within the framework of the design for this investigation that CAI, when administered in sufficient magnitude does indeed have a positive influence on the students' performance. The magnitude of the difference in the mean scores between S-97 and S-98 having no to low level of CAI on one hand and S-99 and S-00 having a much higher level of the intervention attribute on the other was observed to be in the range of 8.5% to 10.5%. In Section6.6, the use of computer based testing (CBT) to supplement CAI was discussed. The framework of the design for this investigation makes no provision for making a distinction between the influence of CAI and CBT on students' performance. Whilst CAI is concerned with the cognitive aspects of students' learning skills, CBT relates to the evaluation methodology. Thus, the inability to provide a satisfactory answer to the dichotomy on 'whether the improvement in the grades is attributable to students having gained a better understanding of the concepts in Statistics II by virtue of CAI or was this outcome a consequence of change in the testing and

assessment methods which, among other aspects allowed for more accurate calculation apparatus' may seem to be a major drawback of this design. However, differentiating between the influence on CAI and CBT is beyond the scope of this study. In any case, this limitation does not stand in the way of concluding that overall, ICT when used as a tool in the instruction of a given subject, in this case, Statistics II, does have a positive influence on the students' performance. A validation to this effect can be drawn from the observations tabulated in Table 5.8 wherein an overwhelming majority of the students concur that application of ICT in form of CAI and/or CBL in a given subject provides a boost to their motivation for learning that subject. Besides, new instructional methodology does mandate corresponding changes in the evaluation techniques. It would be inconsistent to adopt traditional testing methods in this type of a situation wherein students are required to use statistical tables and calculators to solve idealised text-book type problems on their tests and exams even when the instructional methodology, by virtue of the intervention attribute, affords the possibility of solving complex problems resembling real-life situations. Therefore, CAI and CBT are not mutually exclusive. In fact, they are complimentary and hence can be viewed to be interdependent components of ICT in education. The high magnitude of the difference in the mean scores of students between groups exposed to a higher level of the intervention attribute and their counterparts having no or low level of it can thus be attributable to the combined effect of CAI and CBT. At this juncture, it would therefore be appropriate to suggest that whilst referring to CAI it would not be out of place to subsume the effects of CBT and vice-versa. Having thus clarified the semantic aspects of the situation, the answer to the question posed in the second column of the last item of Table 6.4 is in the affirmative. Given the importance of this result to the overall outcome of this study, a series of independent samples t-tests were conducted on the four intakes taken in pairs (hypotheses 6.18 to 6.23) to validate the

outcome of the one-way ANOVA test for hypothesis 6.17. The results were found to be consistent. Needless to say, the net inference of this investigation should be interpreted within the ambit of the specified definitions accorded to CAI and CBT for the purpose of this study which were discussed in Section6.6 and Section6.7.

The results of this investigation suggest that the effects of CAI with an intervention level of up to 10% do not yield any perceptible differences. As illustrated in Figure6.3, the lowermost threshold value in this design at which these effects begin to manifest themselves in terms of their influence on the students' performance is 55%. An iterative trial and error approach will have to be adopted by steadily decreasing the quantum of CAI in order to determine the 'real' threshold value beyond which the effects begin to set in.

Figure 6.3: Zone of Influence of CAI



The investigation has been carried out under specific conditions, the exact replication of which may not be feasible on a longitudinal basis. This significantly weakens the prospects of establishing an accurate mechanism for gauging the external reliability of the measure. The following section wherein a framework for the applicability of this investigation's outcome is established does partially address this problem. On the other hand, the consistency of the outcomes obtained in Section 6.12 whilst exploring the differences in

the performance of students across the four intakes factored with respect to their study major vouches for the measure's internal reliability.

In so far as the validity is concerned, the change in students' scores in response to the variations in the magnitude of the intervention attribute reflects the content of the concept in question, thereby establishing the face validity of the measure. The underlying assumption here is that the students' scores are a true measure of their performance. The question of establishing concurrent validity does not arise in this case as there were no significant differences in the level of academic achievement among the four intakes as was demonstrated by the outcome of testing hypothesis 6.5. Thus, there was no possibility of employing a criterion on which the intakes were known to differ so as to determine the influence of CAI on their performance.

6.15 Relevance

The replication of this methodology is obviously independent of the specialisation of the programme in which the subject is taught as well as its geographical location. However, based on this study alone, there are no grounds to suggest that a similar investigation in say, an undergraduate business management degree programme would yield the same outcome. This could, *inter alia*, be attributable to the differences in the emphasis in the curricular structure of a business management programme with that of a tourism management programme. Also, variations in infrastructure availability and socio-cultural perceptions induced by change in location in which such a study could be replicated will

not guarantee results similar to those obtained in this case. These factors therefore underscore the contextual dependence of this research. The relevance of an empirical investigation of this type in terms of its contribution to the body of knowledge in the field of curriculum studies and evaluation rests in its potential for wider applicability to contextual situations that are identical or similar to the backdrop for this study. Having established the significance of the relevance issue, it can be further explored from the rubric of internal and external relevance.

Internal relevance herein refers to the possibility of enhancing students' performance in non-core subjects within the curriculum that mandate skills similar on their part to those required in Statistics II using the methodology for infusion of ICT into the syllabus as adopted in this study. Specifically, subjects that require analytical skills and numeric literacy such as mathematics and quantitative methods in decision making would stand to benefit from the infusion of CAI as defined in this study. The clustering of subjects of this nature into one group (Group E) as illustrated in Table 3.1 of Chap. 3 validates this argument. Subjects in Group D could also stand to benefit from the infusion of CAI as the skills requirement for these subjects are not radically different from those in Group E. The rule of thumb threshold value as shown in Figure 6.3 that was arrived at as a result of this study could serve as a benchmark for the magnitude of the CAI to be incorporated into the concerned subjects. Depending on their suitability, the actual tools required in terms of software platform and functions may vary from subject to subject but the underlying approach as far as the course delivery and assessment using ICT are concerned, apart from case-specific fine tuning, could remain largely unchanged from the approach adopted in this study.

If the outcome of the study is strictly confined to the context of IFT, the student body that was involved in process can be defined as a population. So as to demonstrate the external relevance of this study by extending its applicability to entities having a similar profile to that of IFT, the inference arrived at in Section 3.8 of Chapter 3 can be taken recourse to. The comparison of curricula of APETIT member-institutions within a framework of predefined criteria with its attendant limitations yielded a measure of commonality among fifteen academic institutions including IFT. Having thus established the contextual similarity amongst these entities, IFT students that were part of this investigation could then be construed as a convenience sample drawn from a student population of the APETIT-15 and *ipso facto*, the outcome of the investigation in this chapter could, with a reasonable degree of conviction, be extrapolated to the other members of this family of APETIT-15. Allowing for fine-tuning apropos variations in locale, socio-cultural attributes and infrastructure amongst the APETIT-15, the methodology adopted in this study for the infusion of ICT into the syllabus of a non-core subject will thus qualify for external relevance.

The contextual dependence of this empirical study places restraints on claiming an across-the-board applicability of its outcome. A more modest audit study design in which the CAI module would be subjected to developmental testing with students using opinion surveys may have toned down the contextual dependence but in the process would have also done away with the rigour of an empirical outcome on the effect of CAI on students' scores. The discussion on internal and external relevance provides a framework within which it would be reasonable to assume that the outcome holds good in terms of its wider applicability. It can thus be stated that ICT in the form of CAI when applied to non-core subjects in

undergraduate programmes in tourism management does have a beneficial effect on the students' performance.

6.16 Theoretical Considerations

Several theoretical models have been propounded in relation to the role of ICT in education with the objective of explaining outcomes of its application in teaching other subjects as well as designing more effective ICT syllabi (Kock, Aiken and Sandas, 2002). The outcome of this study can also be interpreted from the prism of such theories. For instance, the application of the intervention attribute during lectures involved conversations and discussions highlighting the usage of the spreadsheet application in statistics. This, in turn would have contributed towards facilitating the learning process in accordance with the provisions of the conversation theory (Pask, 1975).

The programming facilitated learning theory (Papert, 1993) on the other hand explains how the students could enhance their understanding of statistics based on the requirement on their part to design spreadsheet models, using a host of statistical functions provided in Excel and the PHStat add-in to develop the relevant formulae. As per this theory, engaging students in operationalising the concepts in a given discipline by virtue of writing programs (in this case, developing/applying specific statistical models/formulae in Excel) can significantly improve their level of comprehension in that discipline.

The usage of Excel in the case of this study entailed employing several functions and tools. This effectively meant transferring advanced level competencies to the students in the application of spreadsheet modelling to statistics. From the perspective of the cognitive flexibility theory (Spiro et al., 1992), the application of ICT as a pedagogic tool which involves the transfer of ICT skills beyond the basic level, facilitates the understanding of complex and ill-structured domains on part of the students.

In this study, the administration of the intervention attribute allowed for the adoption of a more experiential learning approach over and above inducing problem-centred learning on the part of the students. This is consistent with the tenets of the andragogy theory (Knowles, 1984), which, *inter alia*, advocates that experiences, including learning through mistakes should provide a suitable platform for learning activities involving ICT. The computational prowess of Excel combined with its ability to perform 'what if' analysis allowed the students the flexibility of an iterative approach, thereby making it significantly easy to track inconsistencies and errors and rectify them. This theory also espouses a problem-centred approach as opposed to a content-based approach.

As the above discussion has demonstrated, meaningful interpretations to the outcome of this empirical study can be derived from a host of theoretical considerations, which, though independent, are mutually consistent.

6.17 Chapter Summary

This chapter focussed on the empirical approach to gauge the influence of ICT as an instructional aid on students' performance. Two possible research designs were explored and after studying the merits and de-merits of each, the one that seemed to compromise the least on rigour and yet satisfied the contextual constraints was selected for implementation. The components that contributed to the contextual framework were identified and discussed. A set of hypotheses based upon research questions pertinent to the objective of this study were formulated and tested using appropriate statistical procedures.

The outcome of this empirical investigation does seem to suggest that ICT in form of CAI contributes constructively towards enhancing students' performance in and by extension, level of comprehension of a non-core subject in a tourism business management degree programme. This outcome is consistent with a host of theoretical considerations as also with the conclusions arrived at in the preceding chapter. Thus, the significance of ICT and more specifically, that of a strategic and conceptual application like Excel, in the form of CAI in tourism and hospitality management education has been demonstrated, the wider implications of which can be derived from the perspective of the inferences arrived at in Chapter 3 which thereby testifies to the relevance of this study.

CHAPTER 7 EPILOGUE

7.1 Summary

The first chapter has provided the backdrop in which the study has been conducted, the significance of which is borne out by the contextual dependence that manifests itself in the discussions and inferences at several junctures in the body of the thesis. It has given a regional and local perspective of the tourism sector, its contribution and significance to the economy and has brought into focus its attendant human resource training and education issues. Towards this end, a situational analysis of Macao's tourism sector was performed which included an overview of IFT and its role in meeting the human resource requirements of the local tourism industry as well as efforts at fostering regional cooperation in tourism education and training issues under the aegis of the APETIT network.

Drawing upon arguments in published literature, the veracity of tourism as an emerging discipline was established in the second chapter. The debate on considering hospitality as being distinct from tourism was brought into focus wherein it was argued on the strength of published literature that whether to accord hospitality education the status of a discipline independent from tourism was a moot issue and from a more holistic perspective, tourism subsumes hospitality as well. This axiom paved the way for defining more robust criteria

for comparison of the curricula which was carried out in the third chapter. As the focus of this study was on the development of managerial competencies, distinction between training which tends to be vocational and education which is more conceptual by nature was also made. An analysis of IFT's curriculum vis-à-vis the two streams, hotel and tourism management was carried out. The differences in the core skills requirements for the two streams notwithstanding, the advantages that accrue from the emphasis on generic management subject components in the curriculum which are common to both the streams were highlighted from the point of view of graduate employment opportunities. A multi-disciplinary model for tourism studies was derived on the basis on Tanner and Tanner's (1980) education model and in this context, the pros and cons of the extensive curriculum in tourism business management studies at IFT were deliberated upon.

The third chapter focussed on the comparison of the generic management component of IFT's curriculum with those of peer institutions who are members of the APETIT regional network. Towards this end, issues in comparison of curricula were discussed and the non-core subjects were clustered into five distinct groups based on which criteria for comparison were defined with the aim of identifying a 'thread of commonality'. The application of these criteria to the APETIT member-institutions yielded fourteen member-institutions that could be considered to have a reasonable extent of similarity in profile with that of IFT. A comparative analysis of the curricula of these institutions including IFT was carried out and limitations of such an approach were also spelt out. So as to enable quantification of the outcome of the comparative analysis, the concepts of proliferation ratio and coefficient of commonality were propounded. The inferences derived herein allow for defining a unique population set which comprises of students of the fifteen APETIT member-institutions including IFT. The significance of defining such a

population demonstrates the common context within which IFT operates in the Asia-Pacific region. Thus, the outcome of studies carried out in any one of these fifteen entities wherein the students can be construed to be a convenience sample derived from the afore-defined population can, with a reasonable degree of confidence be applied and extrapolated to the other fourteen.

Whereas the first three chapters were primarily devoted to defining the contextual milieu and laying the foundations, the fourth chapter touches directly on the core issue of this thesis which is the role of ICT in tourism management education. The contribution of ICT to the tourism sector as a whole was discussed and thereon, the spotlight was shifted to the educational aspects of ICT in tourism. Factors that are potentially responsible for existing gaps and discontinuities between what is taught in the ICT syllabi of tourism and hospitality programmes and what ought to be taught in line with the industry expectations were identified. Concepts and topics comprising the ICT syllabus presently taught in IFT were subjected to scrutiny and were resultantly classified with respect to two dimensions, namely, type and value. The outcome of this bi-dimensional classification allowed for further collapsing the ICT skills and competencies into three broad categories which were industry specific applications, end-user applications and conceptually & strategically focussed applications. Given the focus of this thesis on the development of managerial competencies, the utility of conceptually and strategically focussed applications such as Excel in actuarial subjects was brought into focus and their suitability as a pedagogic tool in form of CAI was established, thereby laying the groundwork and providing the rationale for the empirical component of this study which is discussed in the sixth chapter. From this standpoint, career critical applications were identified and their role as a critical backbone in nurturing managerial competencies was defined. This chapter also included an interim

review and overview of the arguments developed in the preceding chapters with the aim of consolidating on what was achieved thus far, on the basis of which the future direction of the study was brought into focus.

The issue of gaps and discontinuities derived from published literature in ICT skills requirements in the tourism sector that was alluded to in the fourth chapter was subjected to an in-depth scrutiny in the fifth chapter within the ambit of the scope of this study. Towards this end, the Macao tourism industry stakeholders' perceptions on the significance and utility of ICT were solicited. Survey and interview techniques were deployed to gauge the opinions of students, academic faculty and industry practitioners to generate primary data, the analysis of which gave an indication of the gaps and discontinuities that exist between the tourism industry demand and education supply in Macao. The challenges attributable to local nuances in operationalising this exercise were brought into focus, thereby underscoring the strong contextual dependence of this study. With all its attendant limitations, the analysis of this exercise yielded a spectrum of convergences and divergences vis-à-vis stakeholder perceptions. In terms of the utility and potential of ICT applications, the stakeholder opinions were fairly consistent in conferring the accolades on Word & Power Point, Excel and Internet & e-mail. Word processing, presentation and information interchange are regarded as routine operations, devoid of any significant analytical component and pursuant to the arguments developed in the fourth chapter, the applications that facilitate these aspects of managerial responsibilities are bound to find favour among users as convenience tools. Apropos the inferences arrived at in the fourth chapter, the family of conceptual and strategically focussed applications was defined as being career critical. Of these, only Excel qualified being perceived by the stakeholders as relevant and significant from the standpoint of development of analytical

managerial competencies. This outcome attests to the versatility of the spreadsheet application which has been alluded to at several junctures in the thesis and simultaneously validates the choice of Excel as a CAI platform in the empirical component of the thesis which is elaborated in detail in the sixth chapter. The prominent gaps that came to light as a result of this study have been the differences in perceptions of concepts such as networking and file management which were deemed to be important by industry practitioners but not so much by the students. An important outcome of this study was the desire for inclusion in the ICT syllabus of contemporary and futuristic issues concerning the interface of ICT, business and tourism such as B2B and B2C transactions, e-commerce, m-commerce and POS technology, demonstrated on part of the students. None of the interviewees, both from the faculty and among the industry practitioners, alluded to these 'hot' topics. The diversity of opinions among the academic faculty was further exacerbated by an element of incongruence in their response patterns, thereby posing a challenge in extricating this group's views on a collective basis. Nonetheless, the outcome of this aspect of the thesis serves as a pointer towards the development of a more effective ICT syllabus geared at nurturing the essential managerial competencies required by the tourism sector.

In line with the stated objectives of this thesis, the sixth chapter delved upon the conception, implementation and analysis of an empirical study stretching across four cohorts aimed at assessing the impact of ICT as an instructional tool on the students' level of comprehension of concepts in actuarial subjects that require analytical and conceptual competencies. Issues influencing the choice of a quasi-longitudinal design as the investigative methodology, Excel as the application platform and Statistics II as the subject for applying the intervention attribute were deliberated on. Using standard statistical methods, a range of hypotheses on the subject matter was tested. The condition for

normality being satisfied by the test variables allowed for the application of parametric statistical procedures such as ANOVA and independent sample t-test. A baseline study indicated that there was no significant difference in academic achievement between the four cohorts prior to the intervention treatment. Another important outcome was that the differences in the curricular structure of the two streams, hotel and tourism, which were brought into focus in the second chapter, bore no significant influence on the students' performance in non-core subjects such as statistics. This outcome also serves as a validation of the approach adopted in the third chapter wherein no distinction was made between hotel and tourism management programmes whilst comparing the non-core components of their curricula, based on the arguments articulated in the second chapter. The answer to the principal question of this empirical study on whether CAI facilitates the students' level of comprehension of a non-core actuarial subject was in the affirmative. A threshold value beyond which the effects of CAI begin to manifest themselves was obtained. The relevance of this study in terms of its wider applicability was discussed from the standpoint of the framework developed in the third chapter. The outcome was found to be consistent with a host of theoretical considerations propounded in published literature.

7.2 Observations

The longitudinal scope of this thesis stretched across a span of a little under five years during which some interesting observations came to light based on the range of interactions, discussions and interviews on part of the investigator. The following table lists these in a cause-effect format.

Table 7.1 Observations on the effects of ICT integration in the curriculum*

Cause	Effect
ICT enables retrieval and analysis of real data, thereby facilitating design of systems for performing real tasks	Students demonstrate better motivation towards their studies
ICT offers total user-control	Students tend to be more independent and autonomous
ICT simplifies modelling and analysis tasks	Students show willingness to explore solutions to problems
ICT allows easy correction of errors through iteration without repeating tedious procedures	Students are more willing to experiment and take risks

*These observations are largely applicable to conceptual and strategically focussed applications

7.3 Recommendations

One of the principal spin-offs of a study of this nature is the possibility to make recommendations that would contribute towards the overall betterment of the attributes that were researched. On the basis of the inferences and outcomes arrived at in this thesis, following are the suggestions aimed at more effectively leveraging the benefits that accrue from integrating ICT into the tourism management curriculum, both, in terms of content as well as an instructional tool, so as to augment the students' analytical competencies.

- The teaching of generic applications at an introductory level in dedicated ICT courses in a tourism business management programme should be gradually reduced and eventually eliminated as the growing penetration of ICT among students at the higher secondary and pre-university stages is making them sufficiently ICT savvy. Instead, the

course contents should be sufficiently upgraded to an advanced level and emphasis should also be placed on concurrent and futuristic topics related to the convergence of ICT and business management such as B2B and B2C transactions, e-commerce, m-commerce, e-banking, e-travel, POS technologies, ERP and CRM from the context of their relevance to the service sector in general and tourism industry in particular. The importance of maintaining a 'high tech and high touch' approach should be continuously stressed. The possibility of introducing alternative operating systems, application platforms and suites should also be explored.

- Emphasis should be placed on deploying ICT in the form of conceptual and strategically focussed applications in generic management subjects with a two-pronged objective: to attain a higher degree of efficiency in pedagogy and to ensure effectiveness in honing the students' management concepts. For instance, the scope for integrating spreadsheet applications like Excel which is robust and versatile in the teaching and learning of non-core subjects of the actuarial variety such as mathematics, finance, statistics, project and even marketing should be seriously explored.

- Provisions should be made to increase the awareness of other strategic and conceptually focussed applications of the generic type such as Access and Project amongst all the industry stakeholders. That these applications were not perceived to be of particular significance and utility by the stakeholders can be attributed to the low level or even lack of awareness of the potential of these software as decision support systems in management. Such a process of 'enlightenment' can be achieved by exploring the possibility of integration of these applications in relevant subject syllabi

wherein idealised text-book problems can be replaced by more complex real-world cases that require computer based solution techniques. Achieving such an integration and inter-disciplinary synergies would mandate greater coordination on part of the academic faculty. Problem based learning is one such way of achieving this objective and has been introduced in IFT on a selective basis since the academic year 2001-2002, albeit out of different considerations.

- It is imperative to ensure a regular and periodic trilateral dialogue between industry practitioners, academic faculty and students. As the outcome of this study has shown, students belonging to the Gen-X can oftentimes be more techno-savvy and aware of the latest ICT trends, although with a different focus. Whereas the conformists adhere to utilitarian aspects, the more adventurous would experiment with the exotic. Thus, while concepts in networking and file management were considered important by industry practitioners on the basis of their individual experiences, the students demonstrated their awareness of and desire to learn more futuristic concepts in ICT of which there was no mention on part of the industry practitioners or academic faculty. Educators should strive to keep themselves abreast of the cutting-edge, trend-setting technologies developed for the industry and disseminate information in this regard to students as well as industry practitioners.

7.4 A Random Walk

The plurality of issues alluded to in this thesis overwhelms any attempt at achieving a concise monothematic analysis. In the interest of doing justice to the cause of contributing to the existing body of knowledge, a less structured approach wherein a note of random observations and comments is made on the research techniques applied and the goals attained in this thesis would be in order. Such an approach would increase the possibility of bringing to the fore important points which would otherwise have gone unnoticed in the labyrinth of the arguments articulated in the thesis. Following are the jottings made on basis of a random walk through the thesis structure, primarily on the research methods and contributions.

In social science research, the accepted conventions usually determine the outcome of a study. As a case in point, the acceptance or rejection of a hypothesis depends on the arbitrary critical value (α) assigned to the test statistic, the standard convention in most cases being $\alpha = 0.05$. That the veracity of a proposition subjected to hypothesis testing should rest entirely on an arbitrarily assigned α value apparently flies in the face of scientific rigour, thereby casting a pall of scepticism on the reliability of the outcome. In attempting to draw a balance between Type I and Type II errors, parallels can be drawn with the famous Heisenberg's principle of uncertainty in quantum physics, the gist of which is that the momentum and position of an object cannot be measured simultaneously with a cent percent accuracy (Shankar, 1994). Thus, it is imperative to talk in the language

of probabilities and uncertainties and *ipso facto*, it would be inadvisable to consider the inferences obtained on the basis of hypothesis testing as being conclusive and definite.

Then, there is this issue of subjectivity in the interview process. There are no grounds to assume that response to an open-ended question in an interview will be free of the interviewee-interviewer dynamics. Responses produced under one set of circumstances to the same set of questions may differ from those elicited in another set of circumstances, thereby putting to test their reliability. The author's healthy scepticism of this technique fuelled by the contextual constraints such as the small scale of operations in Macao, the language issue and the local socio-cultural attributes which have been brought into focus at relevant junctures in the thesis, further contributes to the conundrum and should be taken into consideration whilst considering the output of the fifth chapter.

The contextual constraints imposed on this thesis have subdued the possibility for triangulation, which is the use of multiple methods to measure a single construct. In the given circumstances, applying an alternate method would have been directed at establishing the truth of the initial method, rather than to simply define it as true. However, in a roundabout manner, triangulation has been applied in establishing the veracity of the conjecture that Excel is an application of significance and utility in tourism management education as is borne out by the outcome of the empirical study as well as surveys and interviews of the industry stakeholders. This argument also applies to the inference that there is no significant distinction in the non-core curricular structure of hotel and tourism management programmes.

One of the principal contributions of this thesis to the body of knowledge has been to consolidate the convergence interface of tourism, ICT and management education. Given the concurrent demands on ICT driven management competencies required in the tourism sector, the inferences arrived at in this thesis assume significance in terms of addressing the discontinuities in education supply and industry demand. At a micro level, the concepts of coefficient of commonality and proliferation ratio have been propounded in this thesis as tools for comparing curricula and syllabi. These concepts serve as an instrument to quantify the extent of commonality in the curricular structures and measure the level of proliferation of subjects and disciplines among the programmes that are being compared and are particularly useful in comparing curricula of programmes that do not fall under the purview of guidelines stipulated by regulatory authorities. Career critical ICT skills were also identified as was the threshold value beyond which the effects of CAI begin to manifest themselves on the students' performance in what has been defined as the zone of influence. Besides, this research has generated scope for further investigation into a host of related topics which are discussed in the following section.

7.5 Scope for further research

Despite the attendant limitations, this study has demonstrated the benefits that can accrue to pedagogy by virtue of infusing the appropriate ICT concepts into the curriculum. The inferences arrived at herein also spawn a host of possibilities for conducting further research on a range of issues touched upon in this thesis, some of which are discussed hereunder.

- This research has been carried out within the ambit of tourism management education. Though all the inferences and outcomes have been interpreted within this framework, there are no grounds to negate the applicability of these results to management programmes of other specialisations. A conservative approach in interpreting the outcomes has been adopted in this thesis so that the claims made are relevant to the context and consistent with the objectives. However, a more liberal interpretation would make permissible the extrapolation of these inferences in varying degrees to programmes other than tourism that include subjects imparting strategic and conceptual competencies. The methodology evolved in this thesis could thus be adapted and applied to other specialised programmes in management at the undergraduate as well as at the postgraduate levels, the outcome of which will allow for more robust interpretations on the role of ICT in the development of managerial competencies.

- The dominant language in Macao is Cantonese though Portuguese continues to be one of the two official languages. Over eighty percent of the tourists that Macao receives are from the greater China region which comprises of Taiwan, Hong Kong and mainland China, who are predominantly Mandarin speakers. It is of interest to note that the medium of instruction at IFT is English whilst the overwhelming majority of students are non-native speakers of the language. Note needs to be taken of the author's inability to converse in the local language which could have had inhibiting effects on conducting this research. Whether or not the medium of instruction has played the role of a mediating factor influencing the outcome of this study is an issue that merits further research.

- In the third chapter, a methodology for comparison of curricula was developed wherein concepts like proliferation ratio and coefficient of commonality were propounded and deployed to define a population of students belonging to academic institutions. This technique can be fine-tuned to compare syllabi of subjects taught in different institutions. For instance, subject to the availability of data in form of detailed course outlines, the syllabi in dedicated ICT courses offered at the APETIT-15 can be compared on the basis of the constituent topics. Such an exercise will provide a macro-view of the prevalent concepts being taught in tourism management programmes in the region as well as bring into focus intra-regional gaps, discontinuities and commonalities.

- The empirical aspect of this study has the scope of being replicated in a range of combinations of one of the actuarial management subjects with one of the conceptual and strategically focussed applications. For instance, the effects of integrating MS Project software as a CAI tool in the syllabus of say, Financial Management could be explored. An exhaustive series of such empirical exercises would contribute towards more authoritatively identifying the ICT driven career critical competencies in management.

- In this study, a regional population was defined in the form of the APETIT-15 to provide a wider degree of applicability to the inferences arrived at in this thesis. A more ambitious step would be towards defining a quasi-global population wherein,

instead of being constrained to APETIT member-institutions imparting degree programmes in tourism management, the curricula of the World Tourism Organisation (WTO) member-institutions offering similar programmes can be studied and compared. Such an exercise will also test the robustness of the concept of commonality with respect to geographical dimensions.

- The contextual dependence of this study has hampered extricating full advantage of the methods applied. A case in point is the difficulty in defining a truly representative sample of industry practitioners. A replication of this study in locales with more conducive circumstances will, besides providing a test for validity of the results obtained herein, be better poised to realise the potential of the methods employed in this research to a fuller extent. Towards this end, a similar study can be carried out in one of the APETIT-15 member-institutions that have been demonstrated to have a profile similar to that of IFT vide inferences arrived at in the third chapter or, as suggested in the preceding point, in one of the WTO member-institution after duly establishing the congruence of its curricular structure with that of IFT. The outcomes of a series of such studies will provide a tool for assessing the reliability of the results obtained in this research and will also contribute towards the WTO's efforts at evolving a framework for voluntary standardisation procedures and guidelines vis-à-vis issues related to quality in tourism education.

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LIST OF APPENDICES

* In the interest of brevity, the spacing for recording answers between questions as appears in the original format has been reduced

APPENDIX 1 MEMBERS OF THE APETIT NETWORK

Source: APETIT

Country	Institution
Australia	University of Queensland
Australia	Victoria University of Technology
Australia	West Coast College of TAFE
Australia	International College of Hotel Management
Azerbaijan	Council for Foreign Tourism of the Azerbaijan Republic
Bangladesh	Ministry of Civil Aviation and Tourism
Bangladesh	National Training Institute of Hotel and Tourism
Cambodia	Ministry of Tourism
China	Tourism Department, Management College, Xiamen University
China	Bohai College of Tourism and Hospitality Management, Dongbei University of Finance and Economics
China	Hotel and Tourism Management Department, Shanxi University of Finance and Economics
China	Shanghai Institute of Tourism
China	Tianjin University of Commerce
Fiji	School of Hospitality and Tourism Studies, Fiji Institute of Techonology
Fiji	University of the South Pacific
Guam	University of Guam
Hong Kong	Hong Kong Polytechnic University
Hong Kong	Hong Kong Technical College
India	National Council for Hotel Management
India	Indo-American Hotel Management Academy
India	Sree Balaji Institute of Hotel Management
India	Shri Shakri College of Hotel Management
India	Rizvi College of Hotel Management
India	Oriental School of Hotel Management
India	Oberoi Centre of Learning and Development
India	North India Institute of Hotel Management
India	National Institute of Hotel Management
India	Academy of Culinary Education
India	Merit Swiss Asian School of Hotel Management
India	Indian Institute of Tourism and Travel Management
India	Gujarat Institute of Hotel Management
India	Empee Institute of Hotel Management and Catering Techonology
India	Educational Institute of American Hotel and Motel Association
India	Canan School of Hotel Management
India	Nageshkar Memorial Hospitality Academy
India	Ministry of Tourism and Culture
Indonesia	Manajemen Pariwisata Indonesia (MAPINDO)
Indonesia	Bali Hotel and Tourism Training Institute

Country	Institution
Iran	Tourism Services Training Center, Iran Touring and Tourism Organization, Ministry of Culture and Islamic Guidance
Iran	Iran Air Training Center
Iran	Allameh Tabatabaei University
Iran	Institute of Training, Research and Operational Consultancy for Tourism
Japan	Rikkyo University
Korea	Dong-A University
Korea	Hang Yang University
Korea	Korea National Tourism Organization
Lao	National Tourism Authority of Lao PDR
Macao	Institute for Tourism Studies
Malaysia	Kolej Puncak Desa (Country Heights College)
Malaysia	Hotel and Tourism Academy
Malaysia	Renaissance Training Centre (RMH Training Centre sdn. bhd.)
Malaysia	School of Hospitality & Tourism Management, Sunway College
Malaysia	School of Tourism Management, Universiti Utara Malaysia
Malaysia	Universiti Teknologi MARA
Malaysia	Flamingo Institute of Further Education
Maldives	Institute of Hotel and Catering Services
Mongolia	Institute of Tourism Management
Myanmar	Hotel and Tourism Training Centre (Ministry of Hotels and Tourism)
Nepal	Nepal Academy of Tourism and Hotel Management
New Zealand	Waiariki Institute of Technology
Pakistan	Pakistan Institute of Tourism and Hotel Management
Pakistan	Pakistan Tourism Development Corporation
Pakistan	Ministry of Minorities, Culture, Sports, Tourism & Youth Affairs
Papua New Guinea	Lae Technical College
Philippines	Asia Pacific Tourism Training Institute
Philippines	Asian Institute of Tourism, University of Philippines
Philippines	Department of Tourism
Philippines	Diversified Corporation
Philippines	International Tourism & Culinary Development School, INC.
Philippines	Punlaan School
Philippines	University of San Jose Recoletos
Philippines	University of Santo Tomas
Russian Federation	Tourism Department of the Russian Federation, Ministry of Economic Development and Trade
Samoa	Samoa Visitors Bureau
Singapore	Singapore Hotel and Tourism Education Centre (SHATEC)
Sri Lanka	Ceylon Hotel School / School of Tourism
Thailand	Rajabhat Institute Phranakhon Si Ayutthaya
Thailand	Tourism Authority of Thailand
Thailand	Silpakorn University
Thailand	Siam University
Thailand	Siam Institute of Technology

Country	Institution
Thailand	School of Hospitality Industry, Rangsit University
Thailand	Rajamangala Institute of Technology, Southern Campus
Thailand	Rajamangala Institute of Technology, Northern Campus
Thailand	Rajabhat Institute Suan Dusit and the Suan Dusit Palace
Thailand	Rajabhat Institute Songkhla
Thailand	Assumption University
Thailand	Rajabhat Institute Phuket
Thailand	Rajabhat Institute Chiang Mai
Thailand	Prince of Songkla University
Thailand	Payap University
Thailand	Naresuan University
Thailand	Mahidol University International College
Thailand	Khon Kaen University
Thailand	Hotel and Tourism Training Institute
Thailand	Dusit Thani College
Thailand	Canadian Universities Consortium Urban Environmental Management Project, Asia Institute of Technology (AIT)
Thailand	Rajabhat Institute Rajanagarindra
Vietnam	Institute of Tourism Research and Development
Vietnam	Hanoi Tourism College

APPENDIX 2 SAMPLE OF MACAO INBOUND TOURISM STATISTICS

Source: Macao Security Forces

	Jan - Sep 2002		Jan - Sep 2001	
Country/Territory	Number	%	Number	%
NORTHEAST ASIA	**8,166,062**	**96.18**	**7,379,274**	**95.85**
HONG KONG SAR	3,918,916	46.16	9,976,457	51.65
JAPAN	105,660	1.24	110,251	1.43
KOREA, REPUBLIC OF	36,719	0.43	36,652	0.48
P.R.CHINA	2,944,795	34.68	2,150,729	27.94
TAIWAN	1,157,997	13.64	1,103,858	14.34
N.E.A. Others	1,975	0.02	1,327	0.02
SOUTH & SOUTHEAST ASIA	**129,520**	**1.53**	**123,270**	**1.60**
INDIA	7,689	0.09	6,631	0.09
INDONESIA	11,783	0.14	9,955	0.13
MALAYSIA	21,000	0.25	19,132	0.25
PHILIPPINES	40,761	0.48	38,341	0.50
SINGAPORE	18,870	0.22	18,764	0.24
THAILAND	17,329	0.20	16,197	0.21
S. & S.E.A. Others	12,088	0.14	14,250	0.19
EUROPE	**78,417**	**0.92**	**82,215**	1.07
FRANCE	11,766	0.14	11,429	0.15
GERMANY	7,442	0.09	8,668	0.11
PORTUGAL	7,165	0.08	7,256	0.09
UNITED KINGDOM	28,452	0.34	32,582	0.42
EUROPE Others	23,592	0.28	22,280	0.29
THE AMERICAS	**83,572**	**0.98**	**81,510**	**1.06**
CANADA	20,512	0.24	19,908	0.26
UNITED STATES OF AMERICA	55,449	0.65	54,611	0.71
AMERICAS Others	7,611	0.09	6,991	0.09
AUSTRALIA, N.Z., C.& S. PACIFIC	**27,803**	**0.33**	**27,810**	**0.36**
AFRICA & MIDDLE EAST	**4,610**	**0.05**	**4,607**	**0.06**
OTHER GEOGRAPHIC AREAS	**161**	**0.00**	**172**	**0.00**
TOTAL	**8,490,145**	**100.00**	**7,698,858**	**100.00**

APPENDIX 3 CURRICULUM AT IFT

NB: Core courses in hospitality/tourism are shaded to distinguish them from non-core or generic management courses

Major: Tourism

YEAR ONE

First Semester

Code	Title	Credit
ENGL 101 / ENGL 102 *	Elementary English 1 / Intermediate English 1	2
INFO 101	Introduction to Computers 1	2
JAPN 101 / MAND 101 **	Japanese 1 / Mandarin 1	2
MATH 101	Mathematics 1	2
MGMT 101	Introduction to Business	2
PORT 101	Portuguese 1	2
SOCI 101	Intercultural Relations	3
SOCI 103	Sociology in Tourism	2
TSMT 102	Travel Agency Techniques 1	2
TSMT 103	Introduction to Tourism Industry 1	3
TSMT 104	Tourism Geography 1	2

Second Semester

Code	Title	TOP Credit
ENGL 103 / ENGL 104 *	Elementary English 2 / Intermediate English 2	2
HIST 101	History of Macau	2
INFO 102	Introduction to Computers 2	2
INSH 100	Internship in Travel Agency 1	3
JAPN 102 / MAND 102 **	Japanese 2 / Mandarin 2	2
MATH 102	Mathematics 2	2
MGMT 102	Principles of Management	2
PORT 102	Portuguese 2	2
TSMT 105	Travel Agency Techniques 2	2
TSMT 106	Introduction to Tourism Industry 2	3
TSMT 107	Tourism Geography 2	2

YEAR TWO

First Semester

Code	Title	TOP Credit
ACCT 201	Accounting 1	3
ECON 201	Economics 1	3
ENGL 201	English Communication Skills 1	2
HIST 201	History of Art	2
INFO 201	Computer Applications 1	2
JAPN 201 / MAND 201 **	Japanese 3 / Mandarin 3	2
LLAW 201	Tourism Legislation	2
MATH 201	Statistics 1	2
PORT 201	Portuguese 3	2
TSMT 201	Tourism and Environment	2
TSMT 203	Travel Services Management	2

Second Semester

Code	Title	TOP Credit
ACCT 202	Accounting 2	3
ECON 202	Economics 2	3
ENGL 202	English Communication Skills 2	2
HMGT 200	Principles of Hotel Industry	2
INFO 202	Computer Applications 2	2
INSH 200	Internship in Travel Agency 2	3
JAPN 202 / MAND 202 **	Japanese 4 / Mandarin 4	2
MATH 202	Statistics 2	2
MGMT 306	Recreation Management	2
PORT 202	Portuguese 4	2
TSMT 204	Principles of Transportation	2

YEAR THREE

First Semester

Code	Title	TOP Credit
ACCT 301	Cost Accounting 1	3
ENGL 301	Advanced English 1	2
INFO 301	Information System Management 1	2
JAPN 301 / MAND 301 **	Japanese 5 / Mandarin 5	2
MGMT 301	Human Resources Management 1	3
MGMT 302	Financial Management	3
MKTG 001	Marketing	2
PORT 301	Portuguese 5	2
TSMT 301	Air Travel Management	3
TSMT 302	Tourist Destination Planning & Development	2

Second Semester

Code	Title	TOP Credit
ACCT 302	Cost Accounting 2	3
ENGL 302	Advanced English 2	2
INFO 302	Information System Management 2	2
JAPN 302 / MAND 302 **	Japanese 6 / Mandarin 6	2
MGMT 303	Human Resources Management 2	3
MKTG 301	Tourism Marketing	2
PORT 302	Portuguese 6	2
SOCI 301	Deontology	2
SOCI 302	Public Relations	3
TSMT 303 ***	Airport Management	2
TSMT 304	Project	2

Remarks :
Minimum Credits for Graduation : 146
* Students will be placed in either course

Major: Hotel

YEAR ONE

First Semester

Code	Title	TOP Credit
ENGL 101 / ENGL 102 **	Elementary English 1 / Intermediate English 1	2
HMGT 101 *	Theory and Practice of Restaurant and Bar	2
HMGT 102 *	Theory and Practice of Kitchen and Pastry	2
HMGT 103	Introduction to Food and Beverage	3
HMGT 104	Nutrition	2

INFO 101	Introduction to Computers 1	2
MATH 101	Mathematics 1	2
MGMT 101	Introduction to Business	2
PORT 101	Portuguese 1	2
SOCI 101	Intercultural Relations	2

Second Semester

Code	Title	TOP Credit
ENGL 103 / ENGL 104 **	English - Elementary 2 / English - Intermediate 2	2
HMGT 105 **	Theory and Practice of Front Desk	2
HMGT 106 *	Theory and Practice of Housekeeping	2
HMGT 107	Food and Beverage Control	3
HMGT 108	Oenology	2
HMGT 109	Professional and Food Hygiene	2
INFO 102	Introduction to Computers 2	2
INSH 101	Internship in Food and Beverage	3
MATH 102	Mathematics 2	2
MGMT 102	Principles of Management	2
PORT 102	Portuguese 2	2
SOCI 102	Social Psychology	2

YEAR TWO

First Semester

Code	Title	TOP Credit
ACCT 201	Accounting 1	3
ECON 201	Economics 1	3
ENGL 201	English Communication Skills 1	2
HMGT 201	Rooms Management 1	2
HMGT 202 ****	Food and Beverage Management 1	2
HMGT 203	Purchasing and Inventory Management 1	2
HMGT 204	Hospitality Industry 1	2
INFO 201	Computer Applications 1	2
MATH 201	Statistics 1	2
MKTG 001	Marketing	2
PORT 201	Portuguese 3	2
TSMT 201	Tourism and Environment	2

Second Semester

Code	Title	TOP Credit
ACCT 202	Accounting 2	3
ECON 202	Economics 2	3
ENGL 202	English Communication Skills 2	2
HMGT 205	Rooms Management 2	2
HMGT 206	Food and Beverage Management 2	2
HMGT 207	Purchasing and Inventory Management 2	2
HMGT 208	Hospitality Industry 2	2
HMGT 209 ***	Planning and Facilities Management	2
INFO 202	Computer Applications 2	2
INSH 201	Internship in Front Office	3
MATH 202	Statistics 2	2
MKTG 201	Hotel Marketing	2
PORT 202	Portuguese 4	2

YEAR THREE

First Semester

TOP

Code	Title	Credit
ACCT 301	Cost Accounting 1	3
ENGL 301	Advanced English 1	2
HMGT 301	Hotel Operations 1	2
INFO 301	Information System Management 1	2
LLAW 301	Tourism and Hotel Legislation	2
MGMT 301	Human Resources Management 1	3
MGMT 302	Financial Management	3
MGMT 305	Strategic Management	2
PORT 301	Portuguese 5	2
TSMT 305	Tourism Geography	2
TSMT 306	Travel Trade Management	2

Second Semester

Code	Title	Credit
ACCT 302	Cost Accounting 2	3
ENGL 302	Advanced English 2	2
HMGT 302	Hotel Operations 2	2
HMGT 303	Project	2
INFO 302	Information System Management 2	2
MGMT 303	Human Resources Management 2	2
MGMT 306	Recreation Management	2
PORT 302	Portuguese 6	2
SOCI 301	Deontology	2
SOCI 302	Public Relations	3
TSMT 307	Tourism Destination Management	2

Remarks :
Minimum Credits for Graduation : 153

Supplementary year (4 th. year) leading to the Bachelor's degree

First Semester

Code	Title	Credit
FINC 401	Financial Management Policy	3
MATH 401	Quantitative Methods for Decision-Making	3
MGMT 401	Advanced Human Resources Management for Tourism Services	3
MGMT 405	Organisational Behaviour and Interpersonal Relations	3
MKTG 401	Marketing Research	3
MKTG 402	Consumer Behaviour	3

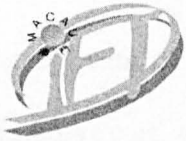
Second Semester

Code	Title	Credit
ECON 401	Tourism Economics	3
FINC 402	Project Evaluation Analysis	3
MGMT 402	Tourism Product Management	3

MGMT 403	Quality Management	3
MGMT 404 *	Seminar in Tourism	3
MKTG 403	Marketing Management for Tourism Services	3

Source: Registry, IFT

APPENDIX 4 LETTER OF AUTHENTICATION FOR STUDENTS' GRADES



旅 遊 學 院
INSTITUTO DE FORMAÇÃO TURÍSTICA
Institute For Tourism Studies

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. Sanjay Nadkarni who is a lecturer at the Institute For Tourism Studies had approached the Registry with a request for access to students' grades in Statistics II as well as their cumulative GPAs for four consecutive cohorts for the purpose of his Ph.D. research. The required information was provided to him for the stated purpose.

Institute For Tourism Studies, Macao, 12th November 2002.

Antonio Chu
Acting Registrar

獲以下認證:
Certificado pela:
Certified by:

tedQual
OMT · THEMIS

澳門望廈山
電話: (853) 561252
傳真: (853) 519058
www.ift.edu.mo

Colina de Mong-Há, Macau
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APPENDIX 5 STUDENTS' SURVEY QUESTIONNAIRE

QUESTIONNAIRE ON ICT CURRICULUM

Dear students,

This survey is to gauge your feedback on the utility and relevance of generic ICT (Information & Communication Technology) skills that are presently included in the Bachelor's degree programme. The outcome of this exercise will help us structure a more effective curriculum in ICT related subjects. The ICT skills have been divided into six broad categories. For each category, there are three attributes relating to the utility/relevance of the concerned ICT skill. Please read the questions carefully and record your answers by highlighting the square box corresponding to the appropriate choice. Thank you in anticipation of your valued feedback.

cheers!
Sanjay

Please indicate your year of study:

Year 3 (Hotel)	☐
Year 3 (Tourism)	☐
Year 4	☐

1. **ICT skill: Computer Theory** (hardware, software, networking etc.)

a) You have found this application useful in studying the following group of subjects (you can choose more than one option)

Areas of discipline	
Core courses (Tourism- or hotel-related subjects)	☐
Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)	☐
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)	☐
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)	☐
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)	☐
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)	☐
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, etc.)	☐

b) The course content of this ICT component in the existing curriculum is (select any one option)

too basic	□
just about right	□
extensive	□

c) This skill can be of potential use to you in your career

yes	□
no	□
can't say	□

2. **ICT skill: Word Processing & Presentation Applications** (Word & Power Point)

a) You have found this application useful in studying the following group of subjects (you can choose more than one option)

Areas of discipline	
Core courses (Tourism- or hotel-related subjects)	□
Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)	□
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)	□
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)	□
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)	□
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)	□
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, etc.)	□

b) The course content of this ICT component in the existing curriculum is (select any one option)

too basic	□
just about right	□
extensive	□

c) This skill can be of potential use to you in your career

yes	□
no	□

can't say	□

3. **ICT skill: Spreadsheet usage & modelling** (Excel)

a) You have found this application useful in studying the following group of subjects (you can choose more than one option)

Areas of discipline	
Core courses (Tourism- or hotel-related subjects)	□
Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)	□
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)	□
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)	□
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)	□
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)	□
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, etc.)	□

b) The course content of this ICT component in the existing curriculum is (select any one option)

too basic	□
Just about right	□
extensive	□

c) This skill can be of potential use to you in your career

yes	□
no	□
can't say	□

4. **ICT skill: Graphic applications & Desktop publishing** (Pagemaker, Visio, Photoeditor, Front Page)

a) You have found this application useful in studying the following group of subjects (you can choose more than one option)

Areas of discipline	
Core courses (Tourism- or hotel-related subjects)	□

Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)	☐
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)	☐
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)	☐
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)	☐
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)	☐
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, etc.)	☐

b) The course content of this ICT component in the existing curriculum is (select any one option)

too basic	☐
just about right	☐
extensive	☐

c) This skill can be of potential use to you in your career

yes	☐
no	☐
can't say	☐

5. **ICT skill: Project & database management** (Access, Project)

a) You have found this application useful in studying the following group of subjects (you can choose more than one option)

Areas of discipline	
Core courses (Tourism- or hotel-related subjects)	☐
Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)	☐
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)	☐
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)	☐
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)	☐

Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)	□
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, etc.)	□

b) The course content of this ICT component in the existing curriculum is (select any one option)

too basic	□
just about right	□
extensive	□

c) This skill can be of potential use to you in your career

Yes	□
No	□
can't say	□

6. **ICT skill: e-messaging & Information retrieval** (WWW, search-engines)

a) You have found this application useful in studying the following group of subjects (you can choose more than one option)

Areas of discipline	
Core courses (Tourism- or hotel-related subjects)	□
Business Operations & Functions (Marketing, Consumer Behaviour, Business, Quality Management, etc.)	□
Practical courses (Internships, hands-on practice in training units, IFTI, etc.)	□
Quantitative courses (Quantitative Methods, Mathematics, Statistics, etc.)	□
Finance & Economics (Accounting, Cost Accounting, Economics, Financial Management, etc.)	□
Social Studies (Deontology, History, Sociology, Legislation, Intercultural Relations, etc.)	□
Organisation Theory (Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, etc.)	□

b) The course content of this ICT component in the existing curriculum is (select any one option)

too basic	□
just about right	□
extensive	□

c) This skill can be of potential use to you in your career

yes	□
no	□
can't say	□

7 In your opinion, does usage of ICT as a teaching/learning tool improve your motivation for learning a subject?

yes	□
no	□
can't say	□

8 Are there any topics/applications/skills in ICT presently not included in the ICT syllabus that you would have wanted to study? If yes, please list these in the space provided, else leave it blank

_____

_____

_____

----------Thanks, that's all!----------

(BH3, BT3 & LT4)

APPENDIX 6 FACULTY INTERVIEW QUESTIONS

GENERIC IT SKILLS REQUIREMENT IN STUDY OF NON-CORE DISCIPLINES

(Interview Questionnaire)

This questionnaire is designed to determine the relevance and applicability of generic IT skills expected of students by the instructors in the non-core (management) subjects as well as the instructors' familiarity with these generic skills.

Name of the Interviewee:

Date:

Place:

Area/Discipline

Areas of discipline	
(A) Social Studies	□
(B) Organisation Theory	□
(C) Business Operations & Functions	□
(D) Finance & Economics	□
(E) Quantitative subjects & IT	□

(A) Deontology, History, Sociology, Legislation, Intercultural Relations
(B) Human Resource Management, Social Psychology, Strategic Management, Organsational Behaviour, Principles of Management
(C) Marketing, Consumer Behaviour, Business, Quality Management, Public Relations
(D) Accounting, Cost Accounting, Economics, Financial Management
(E) Computer Applications, Management Information Systems, Quantitative Methods, Mathematics, Statistics

1) Do you use any form of Information Technology in the preparation and/or assessment and/or delivery of your course/s?

□ Yes □No

2) Which of the following applications/concepts do you use in preparation and/or assessment and/or delivery of your course/s?

1. Networking/file management
2. Word Processing & Presentation (Word & Power Point)
3. Spreadsheets (Excel)
4. Pagemaker/Visio/Photoeditor/others (Graphic, **multimedia** & desktop publishing applications)
5. Databases (Access/ Fox Pro)
6. Internet & e-mail
7. Others (please specify) _____

3) On a four-point scale (wherein 1 is low; 2 is medium low; 3 is medium high and 4 is high) how would you rate your user proficiency in these applications?

	Scale (from 1 to 4)	Can't say
Networking/file management		
Word & Power Point		
Excel		
Graphic & desktop publishing applications		
Access		
Internet & e-mail		
Others _____		

4)

a) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your pedagogic activities? If yes, please could you elaborate?

b) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your pedagogic activities? If yes, please could you elaborate?

c) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your pedagogic activities? If yes, please could you elaborate?

d) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your pedagogic activities? If yes, please could you elaborate?

e) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your pedagogic activities? If yes, please could you elaborate?

f) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your pedagogic activities? If yes, please could you elaborate?

5) In your opinion, do our students need to be proficient in ICT so as to become successful managers?

□ Yes □No

- Why?

6) If yes: From the given list, which, in your opinion, are the three most important applications that a student must be proficient in, if s/he aspires to become a successful manager?

	Rank (from 1 to 3)	Can't say
Networking/file management		
Word & Power Point		
Excel		
Graphic & desktop publishing applications		
Access		
Internet & e-mail		

- Why?

7) Are there any other software/applications related to your subject that you'd want students to be familiar with?

If yes, please state with reasons:

8) Do you think that ICT facilitates the teaching/learning process?

Please elaborate:

9) Is there any point pertaining to ICT in grooming management skills that was not discussed here?

APPENDIX 7 CUE CARDS USED IN FACULTY & INDUSTRY PRACTITIONERS INTERVIEWS

1	2	3	4
Low	Medium Low	Medium High	High

	Scale (from 1 to 4)
Networking/file management	
Word & Power Point	
Excel	
Graphic & desktop publishing applications	
Access	
Internet & e-mail	
Others _____	

	Ranks (top three)
Networking/file management	
Word & Power Point	
Excel	
Graphic & desktop publishing applications	
Access	
Internet & e-mail	

APPENDIX 8 INTERVIEW QUESTIONS FOR INDUSTRY PRACTITIONERS

GENERIC ICT SKILLS REQUIREMENT IN THE TOURISM SECTOR

(Interview Questions)

This questionnaire is designed to determine the relevance and applicability of generic IT skills expected of managerial cadres in the tourism industry as well as the practitioners' familiarity with these generic skills.

Name of the Interviewee:

Designation:

Company/Institution:

Date:

Place:

Area/Discipline:

1) Since how long have you been associated with the tourism & hospitality industry? Please could you elaborate on your industry experience?

2) During the years that you've put in the industry, have to had to interface with any aspect of Information Technology in the execution of your professional duties?

□ Yes (if yes, since when?:_____) □No

3) Which of the following applications/concepts have you been using or had to use whilst in the industry?

1. Networking/file management
2. Word Processing & Presentation (Word & Power Point)
3. Spreadsheets (Excel)

4. Pagemaker/Visio/Photoeditor/others (Graphic, **multimedia** & desktop publishing applications)
5. Databases (Access/ Fox Pro)
6. Internet & e-mail
7. Others (please specify) _____

4) On a four-point scale (wherein 1 is low; 2 is medium low; 3 is medium high and 4 is high) how would you rate your user proficiency in these applications?

	Scale (from 1 to 4)	Can't say
Networking/file management		
Word & Power Point		
Excel		
Graphic & desktop publishing applications		
Access		
Internet & e-mail		
Others:		

5)

a) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your professional activities? If yes, please could you elaborate?

b) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your professional activities? If yes, please could you elaborate?

c) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your professional activities? If yes, please could you elaborate?

d) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your professional activities? If yes, please could you elaborate?

e) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your professional activities? If yes, please could you elaborate?

f) Are there any specific functions/tools in _____ application that come to your mind which are of particular significance to you in terms of your professional activities? If yes, please could you elaborate?

6) In your opinion, do students majoring in hotel or tourism management need to be proficient in ICT in order to become successful managers?

□ Yes □No

- □ Why?

7) If yes: From the given list, which, in your opinion, are the three most important applications that a student must be proficient in, if s/he aspires to become a successful manager?

	Rank (from 1 to 3)	Can't say
Networking/file management		
Word & Power Point		
Excel		
Graphic & desktop publishing applications		
Access		
Internet & e-mail		

- □ Why?

8) Are there any other software/applications (except industry specific) that you'd expect IFT students to be familiar with from the point of view of their career development in the industry?

If yes, please state the reasons:

9) In your opinion, has ICT benefited the hospitality & tourism industry?

Please elaborate:

10) Are there any points pertaining to ICT in grooming management skills that were not discussed here?

APPENDIX 9 A SAMPLE OF NOTE OF THANKS TO THE INTERVIEWEES

-----Original Message-----
From: Sanjay Nadkarni
Sent: Friday, November 15, 2002 2:44 PM
To: 'adagen1@macau.ctm.net'
Subject: interview –note of thanks

Dear Dr. Salgado,

Thank you for having received me in your office yesterday. The interview indeed provided for a very stimulating and interesting discussion. The rich haul of opinions on the role of information & communication technology in the area of tourism management will certainly contribute towards achieving the objectives of my Ph.D. research. I much appreciate your consent to quote you in the text of my doctoral thesis as and where necessary. I shall keep you posted of the outcome.

best regards,
Sanjay Nadkarni