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Acceptance of Teaching Technology in Hospitality Education: Impact of Personality

Master of Business by Research and Major Thesis (BRAH)

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Abstract

Hospitality educators teach increasingly diverse student cohorts, operate within a challenging economic environment, but need to provide graduates with a wide range of academic and employability skills that reflect the complexity of their industry. An increase in the utilization of teaching technology in hospitality education can be seen as one response to a perceived need for the provision of more efficient and effective services to students. However, the suitability of technology-supported teaching approaches for this discipline is commented on in the literature, but not evidenced. Therefore, the aim of this study was to develop a better understanding of the individual personality types of hospitality students and its effect on the acceptance of a specific teaching technology, namely WebCT.

Data were collected using a survey method. Two instruments, the Myers-Briggs Type Indicator for personality and a researcher-constructed instrument based on Davis' Technology Acceptance Model (TAM) were used. In this model, the acceptance of a technology was defined in terms of the outcome of the participant's attitude towards this technology, which itself was a combination between Perceived Ease of Use and Perceived Usefulness. The final sample comprised 212 hospitality students in their first or second year of study at a university in the western region of Melbourne. This study hypothesised that individual personality characteristics of the students would have a significant influence on their acceptance of WebCT. The results supported the hypotheses across the personality constructs on the attitudinal score of the TAM. As such, personality differences could not be used to explain attitudinal differences towards WebCT within this cohort. However, the analysis of student personality types validated earlier studies on the dominance of STJ types and has implications for curriculum design and delivery. Moreover, individual characteristics influenced responses to single items of the acceptance questionnaire, indicating a need for using larger sample sizes. The usefulness of the TAM appears to have been validated by this study. Differences between the current results and those of previous studies may be explained by the mandated usage environment in which this study took place.

Declaration

I, Florian Aubke, declare that the Masters by Research thesis entitled "*Acceptance of Teaching Technology in Hospitality Education: Impact of Personality*" **is no more than 60.000 words in lengths, exclusive of tables, figures, appendices, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award accepted for an award of any other degree or diploma. Except where otherwise indicated, this thesis is my own work.**

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Florian Aubke   **Date**

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Chapter 1   **Overview of the Thesis**

1.1   Introduction

The hospitality industry has grown from its initial purpose of welcoming and catering for strangers and those in need and has transformed itself over the past decades into a complex industry that caters for a myriad of consumer segments (Lashley 2000). The industry has become increasingly complex and organisations face challenges similar to other industries where competition is high. In addition, hospitality is often described as a 'people-industry' because of the importance of the individual interactions that forms the core of most processes in the industry. This interaction has become pivotal for businesses as the general homogeneity of products offered increases the necessity for other means of differentiation for the customer (Adam and Maxwell 1995). The increased complexity of the industry requires the application of novel business practices which in turn need theoretical frameworks and necessitates the involvement of strategic practitioners who have the ability to address and conceptualise the problems that may arise in order to better understand the emerging complexities (Ingram 1999). These theoretical paradigms have initiated much of the industry related research and as a result have provided educators with knowledge and tools to fulfil the increasing demand for better trained, competent and multi-skilled employees (Sigala and Baum 2003).

Moreover, in response to some of the transformations that have taken place in the industry, hospitality education has advanced in scope and focus. Today, a range of educational institutions, from technical colleges to universities offer hospitality programs with a clear shift away from vocational education towards a managerial and operational approach. At the same time as the industry has changed in terms of its increasing demand for graduates, education providers have continued to modify curricula and teaching practices. However, despite the changing environment within which the universities operate, the development of teaching approaches have been slower (Jayawardena 2001). Thus, Universities have made little use of innovations in

educational technology such as the availability of Classroom Management Systems (CMS), for instance WebCT (Sigala 2002).

The advanced integration of teaching technology and the acceptance of this technology by the user has been the focus of a number of studies, most of them applying adoption and diffusion theory (Taylor and Todd 1995), exploring patterns of adoption and aiming to predict whether this technology will have widespread success. In this research, little emphasis has been placed on the role of the individual student, nor was a focus on hospitality education evident.

1.2 Aims of the Study

The purpose of this study was to achieve a better understanding of the extent to which a specific cohort of hospitality students could be seen as having similar characteristics and approaches to learning. It also sought to better understand the role these individual characteristics played in determining some aspects of students' learning behaviour. It did this in order to provide instructors with a more effective understanding of the way students learn and enable them to respond effectively and efficiently to the needs of their diverse student cohort. One approach explored in this field of educational research is whether students' personality has an impact on a contemporary learning environment. It appears that a large proportion of research in this area draws on the work of Carl G. Jung and his personality constructs (Horton, Clarke and Welpott 2005). Also much of this research has relied on the Myers Briggs Type Indicator (MBTI®) to quantify Jung's theory.

In view of the fact that research in this area began in the 1970s it may seem surprising that a better understanding has not been achieved of the way in which the students' MBTI type impacts upon their academic behaviour. One possible explanation for this is that academics have wanted simple solutions which could be easily implemented. Yet the complexity of Jung's theory makes this unlikely to be a reality. Thus Myers (Myers &

Myers 1980) have stressed that each type has unique strengths and no type is superior to another. In other words knowledge of a person's typology does not allow predictions to be made about actual learning behaviour. In terms of the MBTI typologies this means that students' attitudes and behaviour probably depend upon a variety of factors: whether the student's typology matches those of other students undertaking the subject, the discipline (business or liberal arts degree), the way in which the subject is assessed and how the material is presented. This means that research involving the MBTI needs to become more sophisticated and no longer use this instrument to try and find solutions which will be able to be applied across all situations where learning occurs. Therefore research in the future needs to try and identify both when a person's MBTI typology will not correlate with behaviour as well as when it will - as this is the only way it will become possible to identify the conditions under which a person's personality is likely to have an impact on how they behave in different learning contexts.

This study endeavoured to investigate this issue by combining the research fields of technology adoption on the one hand and students' personality on the other. It also sought to investigate the usefulness of the Technology Acceptance Model (Davis 1989) for understanding students' acceptance of WebCT in a mandated environment. The study had two specific characteristics which made it less likely that personality factors would play a significant role: the mandated nature of the environment and its focus on technology. As Biggs (1999) has argued in his '3P' model students' attitudes and approach to learning will be determined by both their individual characteristics and the learning context. Thus within some contexts personality may be a central issue whereas in other contexts the determinants are more likely to be students' previous exposure to this type of learning or their current understanding of relevant issues. In view of extent to which current university students have been exposed to technology it seems likely that in a teaching context which involves technology their familiarity with technology would mean that there would be no relationship students' personality characteristics and their acceptance of technology.

Thus if it can be demonstrated that students who favour a range of different learning approaches, as measured by the MBTI, demonstrate a positive attitude towards technology, then this would indicate that it may be enormously beneficial for educators who teach diverse cohorts of students to introduce technology into their teaching. More specifically, this study has the potential to inform future teaching approaches in hospitality education.

1.3   Theoretical Foundations

The study builds on the work that has already been established in the two research fields it endeavours to link. Firstly, individual differences in behavioural patterns are often related to personality.   For this study, Jung's personality framework is applied. According to his theory, individual differences and general behaviour are grounded in distinct combinations of preferences. Essentially, these preferences relate to engagement with the social environment as well as information processing and organisational preferences. Jung's theory has been quantified by Isabella Briggs-Myers and Katharine Briggs in the design of the Myers-Briggs Type Indicator (MBTI®), which will be introduced in more detail in chapter 2.2. Secondly, there is a strong reliance on the Technology Acceptance Model (TAM) as introduced by Davis (1989). In this model, the acceptance of a technology is defined in terms of the outcome of the subject's attitude towards this technology, which itself is a combination between Perceived Ease of Use and Perceived Usefulness. The TAM construct and its current applications are covered in more detail in chapter 2.3.

1.4   Context of the Study

This study was conducted with hospitality students at a University situated in the western region of Melbourne.   This University's teaching and learning environment has dramatically changed over the past decade. The student cohort has become increasingly diverse as characterised by their different personal, cultural and economic backgrounds. Further, this cohort needs to develop during their hospitality programs up-to date technical and technological skills, academic knowledge and life skills in order to make them employable.   These changes have demanded creative and novel responses from academics in both course content and teaching modes. Sigala and Baum (2003) suggest that the inclusion of modern technologies in the education environment may be a response to some of these challenges.   Further, such an approach may also meet the demands of the industry for information technology literate graduates.   However, the value of implementing information technology in hospitality education and its efficacy may not yet be fully developed or its processes well understood (Sigala 2002). Thus, it is suggested that, in order to deploy these systems effectively, it is necessary to gain a better understanding of the students' learning preferences and how this affects their acceptance of the teaching technologies that are currently being used in higher education hospitality and tourism management courses (Ahn 1999).   Billings (1993) raised the concern that looking at learning styles alone may be insufficient and suggests that looking at personality types may be a better way to understand not only learning strategies, but also students' communication and relationship style preferences (Whittington and Dewar 2000). Yet previous research has indicated that the relationship between academic behaviour and Jung's typologies is highly complex and results have been inconsistent (Belanger 2001).

In terms of teaching technology, a number of studies have been conducted to address and assess the efficacy of teaching technologies (Groves 2001). However, these studies have tended to focus on either a particular technology, such as specially designed content delivery software, classroom management systems, or new advances in online delivery modes (Casado 2000; Woeber and Gretzel 2000; Farrar and Lambert 2001; Pituch and

Lee 2006). Thus these researchers' objective has been to understand the effectiveness of these tools or software applications. To a lesser degree some researchers have focussed on the individual student who uses the system (Sabry and Baldwin 2003; Drennan, Kennedy and Pisarski 2005; Lashley and Rowson 2005). Hence an integral part of this study was to draw conclusions about the acceptance of an implemented teaching technology, which was used by a diverse student cohort with a range of different personality characteristics. It did not focus on the technology itself.

The University in which this study was conducted deploys WebCT Campus Edition 6.0 across all of its onshore and offshore campuses. The degree of adoption of the WebCT technology varies greatly across the institution and an informal search has shown that the majority of academics use the technology to disseminate lecture material but otherwise rely on traditional methods of teaching. The Faculty of Business and Law initiated compulsory introduction of WebCT across all its subjects in 2006, mainly to address issues of consistency across subjects delivered onshore as well as offshore. This further underpins this study as the faculty-wide deployment increases the need for an informed adoption of the technology in which not only the software with all its functionalities but also but also the relevance of the individual traits of the end-users are understood.

Chapter 2   Review of the Literature

2.1   Introduction

In this chapter, research relating to hospitality education, student personality and technology acceptance in general are elaborated on. The first section of this chapter introduces the research environment and deals with the evolution of hospitality education, which appears to be moving away from the traditional vocational orientation to establish itself as a more widely accepted academic discipline. Recent advances in hospitality education that affect the learning environment, teaching methods and curriculum design are explored. The individual student is the focus of the second section which explores the theory of personality more closely.   After an initial theoretical introduction, contemporary applications of personality research are discussed and contrasted. The Technology Acceptance Model, its evolution and contemporary application in education is the subject of the third section of this chapter. Given the scope of the literature covered in this chapter, a summary of the key issues is presented with a focus on the current study before the research hypotheses are stated.

2.2   Hospitality Educational Environment

In this section the particular focus is on the areas of hospitality education with an aim to better understand the current hospitality educational environment.   The trend to implement Information and Communication Technology (ICT) as a means of teaching and the relevance and efficacy of this teaching technology in vocationally oriented disciplines such as hospitality is explored.

2.2.1   The Hospitality Curriculum

Historically, the hospitality industry required little or no formal training of its employees (Wood 1992) a condition that changed during the early twentieth century with the emergence of larger scale commercial hospitality enterprises and increased professional

competition. Recently, hospitality has matured and become a more complex industry with demand for multi-skilled employees (Sigala and Baum 2003). Not only has this influenced the characteristics of the industry, but has resulted in the emergence of formally recognised education programs that, in turn, need to respond to the specific demands of the industry.

The genealogy and future trends of the hospitality curriculum has been the focus of a number of studies in recent times (Baum 1989; Lashley 1999; Airey and Tribe 2000; Morrison 2001; Christou and Sigala 2002; Morrison and O'Mahony 2002; Morrison and O'Mahony 2003). These studies have debated the shift in hospitality education from its former vocational focus to the emergence of hospitality as an academic discipline. The inclusion of disciplines such as hospitality and tourism into the higher education curriculum has been criticised on the grounds that the strong vocational orientation of these areas may not match the traditional intellectual orientation of a university (Ewen 1999). However, in order to address these criticisms the mode of delivery of the curriculum has endeavoured to incorporate reflective thinking and critical analysis whilst at the same time continuing to develop technical skills. This development has been described as the liberation of hospitality education (Lashley 1999; Morrison and O'Mahony 2003) and has resulted in an educational approach that aims to balance some aspects of vocational training with the higher order thinking and reflection traditionally taught at university. The shift away from vocational training has been criticised (O'Connor 1996) and the resulting debate about the relevance of hospitality and tourism higher education to employment continues to influence curriculum design and teaching methods.

Whilst a number of authors have been concerned with the strategic direction and vision of hospitality as an academic discipline, their work has resulted in the emergence of different schools of thought (Jones 2004). In an attempted to classify these schools of thoughts, Jones (2004) suggested that hospitality has a scientific, managerial, philosophical, sociological or anthropological basis or perspective. This myriad of perspectives has further contributed to the diversification of hospitality education and as

such has increased the complexity of the discussion about relevance. Recently, Lashley (2005) evaluated educational approaches and research in hospitality and concluded that an overly managerial focus on hospitality education (which tends to dominate the sector) does not fully address the needs and wishes of the industry for which students are being prepared. Earlier, Airey and Tribe (2000) introduced the concept of the 'reflective practitioner'. They suggested that this capacity for thoughtful reflection is a quality which graduates entering the hospitality industry need in order to deal effectively with increasingly complex and unpredictable problems. Thus they argued that future hospitality graduate programs should move away from a 'vocational-action' oriented educational approach towards a 'reflective-liberal' orientation. This work of Airey and Tribe (2000) highlights the importance of understanding the hospitality industry in order to educate future managers in a way that will meet the needs of the industry.

Two fundamental questions arise as a consequence of this debate. These are:
1)   What is the consequence for the educational sector?
2)   To what extent is it appropriate to allow the distinctiveness of the industry and the individual characteristics students who are attracted to the industry influence the way the discipline is taught at university?

The traditional view of hospitality education has been that it needs to prepare students for the requirements of the industry (Jayawardena 2001). However, other important factors that influence the design of an appropriate curriculum may be:

1)   The characteristics of the students being taught
2)   The core set of skills industry requires students to possess
3)   Actions needed to ensure a match between students' skills and abilities and the needs of the industry

Whilst a number of studies have discussed curriculum development, only a few have focussed on the relevance of the characteristics of students. Thus Lashley's (2002) research is interesting because he has investigated hospitality student's learning styles

and has argued that hospitality students tend to learn "in a particular way". Although Lashley's view (1994; 1999; 2002) of dominant learning styles in hospitality education and the implications of this for hospitality educators has been investigated in subsequent studies (Hsu 1998; Hsu 1999; Barron and Arcodia 2002; Hsu and Wolfe 2003; Barron, Watson and McGuire 2006) many questions remain unanswered in terms of how they evolve and within which contexts they are likely to have an impact. This probably reflects the fact that the relationship between learning styles and behaviour is highly complex. As Biggs (1999) has noted, students' behaviour in a learning environment is initially influenced by two different types of factors - relevant characteristics of the student and the learning context. These then have an impact upon their attitudes towards a subject and their learning behaviour. Whilst the relevant individual factors discussed by Biggs (1999) were the nature of the learners' previous experience and their familiarity with the concepts, in other contexts, particularly when students have a lack of relevant experience it seems more likely that learning styles or personality factors could play a role. Moreover this may explain the contradictory results that have been found by Lashley (1994; 1999; 2002) and those of other researchers (Hsu 1998; Hsu 1999; Barron and Arcodia 2002; Hsu and Wolfe 2003; Barron et al. 2006).

The next section explores in more detail the hospitality industry's need for skilled graduates and the consequences of this for the educational sector.

2.2.2 Industry Demand

The hospitality industry has distinct characteristics that place particular demands upon employees. Within a higher education environment, these demands need to be acknowledged and reflected in the curriculum, particularly when skills are identified as determining success within the industry (Baum 1990; Tabacchi, Krone and Farber 1992). Some of the key characteristics and requirements of the hospitality and tourism industry identified by Gillet, Thompson and Whitelaw (2005) are:

1)   Staff are required to be highly adaptable and flexible in order to respond to constantly changing demands from customers and stakeholders;

2)   Staff need well developed interpersonal skills and cultural sensitivity to interact with customers and colleagues from diverse cultural, demographic and ethnic backgrounds;

3)   Economic constraints require highly efficient business practices that often conflict with the highly individualised service component expected by customers;

4)   The industry has demanding work hours and staff are expected to sustain a high level of performance at all times, and,

5)   Employees have different skill levels, ranging from largely untrained workers to managers who have both operational experience as well as management expertise.

As a result of the complexity of the industry it is not surprising that the skills mentioned in the literature include professional knowledge, human relations and interpersonal skills, an ability for strategic and managerial thinking, analysis and reflection, gathering and processing of information (Jonker and Jonker 1990; Shaban 1993; Kay and Russette 2000; Whitelaw and Gillet 2003; Littlejohn and Watson 2004).   Furthermore, specific computer literacy skills are increasingly needed and as Cheung and Law (2000) indicate, these should not be neglected in the curriculum.

It would appear therefore that in order to deal with these demands, educators need to design dynamic curricula and use innovative teaching approaches.

2.2.3   Implications for the Education Sector

As Littlejohn and Watson (2004) suggest, it is important for educators to consider graduate employability in their course design and delivery modes. In terms of the multi-skilled expectations and demands of the hospitality and tourism industry, this puts particular pressure on education providers in these disciplines. In particular, it seems as if universities are required to provide hospitality graduates with:

1)   A fundamental understanding of the vocational component of the profession;

2)   A sound knowledge of business and managerial practice;

3)   Well-developed interpersonal skills; and

4)   An ability to think critically, analyse and reflect upon problems and provide creative solutions to these problems.

The vocational nature of these disciplines often presents higher education providers with the dilemma of needing to combine practical training with classroom-based delivery in order to provide graduates with professional experience and academic skills. Neglecting the practical component could result in incompletely educated students and hospitality degrees that are not accepted by the industry. An over-reliance on practical aspects, on the other hand, jeopardises the academic rigour and as such the perceived value of a higher education degree.

The dual sector system in Australia provides an educational framework where vocational training is provided by the Technical and Further Education (TAFE) sector, and universities tend to focus on more abstract or academic types of learning. This does not mean that higher education does not cover some types of vocational training, but it is not its main focus. Furthermore, since many students articulate from TAFE courses to higher education courses, these higher education students already possess practical skills. Another way of including a practical component into the curriculum is to require students to complete a compulsory internship as part of their studies. Whilst the practical components are generally considered to be important, it is often too expensive to provide these experiences in the context of purpose-built training facilities such as restaurants, kitchens or accommodation facilities (Morrison and Laffin 1995). Groves (2001) found that the returns of running such operations often do not justify the costs or the educational outcome but failed to provide statistical evidence for this argument. Nevertheless, it appears as if new teaching technologies, such as computer simulations, videos and other rich media, can be introduced into the curriculum as a new form of experiential learning approaches to develop some of these practical skills.

Furthermore, increasing economic pressure requires that the performance levels of academic staff need to continually improve and that more effective and efficient services need to be provided. One way to respond to some of these pressures is to implement

Information and Communication Technology (ICT) in the classroom as a means for course delivery.

It seems to be increasingly acknowledged that the implementation of information and communication technology in the classroom serves two purposes (Sigala 2002). Not only can its introduction improve the efficiency of teaching approaches but it also provides the students with computer literacy skills that are imperative within a modern workplace (Cheung and Law 2000; Kandampully and Duddy 2002). The next section therefore focuses on the implementation of Information and Communication Technology (ICT) in hospitality education in both functions, as curriculum content and teaching technology and argues that an implementation of ICT as a teaching technology has a positive flow-on for the learning outcomes of students.

2.2.4   ICT in Hospitality and Tourism Education

It has recently become apparent that the development of new technologies has influenced the teaching and learning approaches used in higher education (Sigala 2002). The widespread availability of fast and reliable network services for both educational institutions and end users has led to an increased integration of the technology into teaching practices, for both traditional course delivery modes and, more recently, online education. It can be observed that this development is also reflected in the way recent educational materials are designed and structured, allowing instructors to facilitate the technologies available to them. Methods such as using Web pages to deliver course content seems to be common, however, a big advantage of such approaches is that the Internet can be used to support the delivery of multimedia elements, such as audio, video and interactive hypermedia (Austin and Mahlman 2000). Many educators are interested in the capacity of Internet-based learning to provide flexibility and convenience for the learner. A number of technologies and software programs have also been developed to assist the individual or the educational provider.

When discussing the educational impact of ICT in a hospitality context, it should be acknowledged that hospitality education is still influenced by the traditional nature of the

industry, as has been discussed previously. As opposed to traditionally classroom-based courses, the vocational nature of hospitality education programs seems to limit the scope to implement novel teaching approaches. Thus the question needs to be raised about how far the delivery of a vocationally oriented course can be enhanced by the adoption of teaching technologies. One criticism of teaching technology is that when a web-based context is used to deliver the content that was previously delivered face-to-face, students can become detached from the subject (Beyth-Marom, Saporta and Caspo 2005). Therefore, the applicability of this technology for hospitality education has been questioned, given the course's strong practical orientation and the students' apparent preference for practical applications of the curriculum (Horton et al. 2005). This argument is probably incorrect and demonstrates the unwillingness of hospitality educators to consider the value of alternative methods of delivery. Since modern hospitality education is still characterised by this applied approach, the question is, whether teaching technology is a suitable tool to deliver this applied content.

Over the past decade, the applicability of teaching technology to hospitality education, and the need for its implementation in the curriculum appears to have been recognised (Kasavana 1999; Cho and Schmelzer 2000; Christou and Sigala 2002; Sigala 2002). However, the increasing body of work that deals with its use in traditional university courses may not necessarily be applicable to a distinct and applied vocational discipline such as hospitality.

Connolly and Sigala (2001) argue that the implementation of ICT into all aspects of the hospitality and tourism industry has shaped the characteristics of the industry and placed new demands on skills required by employees. Further, these authors argue that educational curricula should reflect this change and should increasingly foster student's computer literacy and knowledge management skills (Christou and Sigala 2001; Sigala 2002). The hospitality industry consists of a few dominant players and a large number of small and medium enterprises (SME), but irrespective of size, the industry's dependence on ICT for business purposes is clear (Sigala and Baum 2003). Even at a minimum level,

hospitality and tourism businesses use information technology for basic communications such as word processing and database management.

In traditional, vocationally oriented hospitality and tourism education programs, the main focus has been on providing students with these applied skills. According to Mandabach, VanLeeuwen and Bloomquist (2001), the occasional inclusion of reservation or food and beverage management systems represents an inadequate preparation of students for employment in the hospitality industry. Thus, it can be argued that the reason for implementing ICT in the hospitality and tourism curriculum should be less about teaching the mastery of specific technological applications (e.g. Point-of-Sale systems or Property Management Systems) but on familiarising students with technology in general and creating an appreciation of the role technology plays in today's workplace. In this sense hospitality and tourism education does not differ greatly from any other higher education discipline, because it is the appreciation and mastering of the technology and the ability to apply it creatively and efficiently to given tasks, that is at the core of the so called "hidden curriculum" (Mandabach et al. 2001).

Teaching styles and delivery techniques have changed as the curriculum has accommodated to the availability of new technologies. Some of these changes have been about delivering an educational product more quickly, more flexibly and at a more standardized and consistent level (Sigala 2002). In spite of these benefits, some questions remain about the impact technology has on the learning experiences of students.

Whilst there has been considerable discussion about ICT in education, it has largely concerned its efficiency and effectiveness (e.g. Carland and Carland 1990; Harris 1995; Athanasou 1998; Ulmer 1999). Thus the Internet offers great flexibility to both learners and instructors by not being spatially or temporarily restricted, but this does not necessarily mean that it enhances learning (Sigala 2002). As Sigala (2002) acknowledged, a simple transfer of material to an online environment does not contribute to either efficient use of learning resources or provide an effective educational

framework. Further, Sigala (2002) argues that the benefits of an online learning system can be diminished by its improper use and when inappropriately used it can be inefficient and even counterproductive to the learning experience of students. For students, it is the autonomy of access to the resources that can be seen as the biggest advantage of the Internet, especially for those students who work in paid employment while studying. Lecturers, however have a different perspective and for them the advantage of ICT lies in its ability to provide access to a much wider student cohort than a traditional on-campus system does (Kasavana 1999). This allows educators to reach an audience that may otherwise not be able to physically attend a traditional university because of dynamic working hours as it is normally the case in the hospitality industry.

Early critics (Fitzelle and Trochim 1996) questioned the effectiveness of these technological developments, and there appears to have been no substantial study that has demonstrated that technology-supported teaching methods have more effective academic outcomes. Despite the lack of empirical evidence, the development of ICT has widened the range of delivery modes. Originally, the Internet and associated technologies were seen to be only relevant for distance learning, now they are increasingly integrated into traditional educational delivery modes, a development known as *blended learning*.

Sigala (2002) suggests that there are three requirements for if a technology oriented learning environment aims to be pedagogically sound, efficient and effective in its use and efficacious in its application:

1)   A detailed knowledge of the individual characteristics of the user;
2)   An implementation that is constructively aligned with educational goals and desired graduate skills; and
3)   An operational design that enhances the usability and encourages engagement beyond the necessary.

The common approaches in technology-supported teaching have been further detailed by Ryan (2001) who has identified three major categories for Internet-based learning:

Self-paced independent study. Students determine their schedule of study and have access to the study material as long as they require. Learning assessments typically come in forms of pre-programmed responses and the student has limited access to an instructor or fellow students. This form of study can be highly flexible and suits a number of professional development students, but it requires the highest level of motivation in students.

Asynchronous interactive. In this study mode the student interacts with the instructor or other students, but not at the same time. The uses of email and discussion boards often function as a communication tool in this study mode. Individual students have access to, and support from, an instructor and other students. Although still self-paced to some degree, this offers less flexibility than the independent study mode.

Synchronous learning. This format is the most interactive and closely resembles a traditional classroom. The student attends live lectures and communicates via real-time chat. Here, the learning flexibility is restricted by previously determined lecture schedules but as a result places less demands on the student to be motivated and less organised.

The common blended learning approaches attempt to introduce some of the flexibility of the independent and asynchronous study into the modern learning environment. One software package that allows a step-wise integration of Internet-supported learning in a traditional learning environment is WebCT (Web Course Tools) (Goldberg and Salari 1997).

WebCT integrates communication tools such as discussion and bulletin boards for announcements, chat rooms, private email and calendars. From a lecturer's point of view, WebCT can provide support for all of the previously discussed study modes. A lecturer can therefore facilitate a platform to disseminate lecture content, similar to a web site, or more advanced users, can run entire courses within a WebCT environment. For

the later type of application, WebCT provides course management tools for grading, monitoring and tracking student progress. If required by the lecturer, students can submit assignments and create personal web pages and presentations as part of their course, all within WebCT.

2.2.5 Section Summary

This section has discussed the nature of hospitality education and its pedagogical evolution. Hospitality's vocational nature still influences the way the discipline is taught, but research has been conducted and a school of thought has emerged which attempts to provide alternatives for understanding the complexity of the discipline and, in turn has influenced hospitality education in recent years. One of the key influences of curriculum design is the industry's demand for a range of graduate characteristics that inform modern teaching content and approaches. One of the more recent trends is the facilitation of educational technology. Pressures to operate more economically have been identified as one driver for this trend; another one has been the increased reliance of the industry on Information and Communication Technology (ICT). Some researchers (Sigala and Baum 2003) suggest, however, that the latter trend may provide sufficient justification for the deployment of teaching and learning technology in higher education.

2.3   Student Personality

Maddi (1976, p. 9) defined personality as "a stable set of characteristics and tendencies that determine those commonalities and differences in the psychological behaviour (thoughts, feelings and actions) of people".   More recently, Phares (1991) defined personality as a "pattern of characteristic thoughts, feelings and behaviour that distinguishes one person from another " (p. 4).   Throughout the literature many definitions of personality are used but generally these definitions agree that personality is relatively stable and that it can be used to distinguish between individuals and to explain, and even under some conditions to predict, their behaviour.

The extensive research literature on the influence of personality in a learning context indicates an inconsistency in research findings. In some situations it appears that personality may play a fundamental role in the way students learn and behave in an educational environment (Dunford 1993; DiTiberio 1996; Brown 1999; McClanaghan 2000; Ziegert 2000; Borg and Stranahan 2002). In other research personality dimensions have been found to be only influential initially (Schroeder 1993) or to have no impact on students' behaviour (Belanger 2001).   This research suggests therefore that the relationship between learning styles and personality may be influenced by the nature of the cohort and the context within which the learning takes place.

Additional research suggests that people select career paths and industries that seem to suit their own personality type (Sciarini, Woods, Boger, Gardner and Harris 1997). However, this is made more complex because it can be assumed that students make these career decisions based on their own perception (or misconception) of the industry. As a result, the student cohort may not necessarily represent the personality types which are dominant in the industry. However, about twenty years ago it became apparent that certain personality types were overrepresented in a hospitality cohort (Brymer and Pavesic 1990), a fact that appears not to have changed (Gillet et al. 2005) despite the environmental changes previously mentioned. This suggests that hospitality academics may be teaching a student cohort that is distinctly different from other student cohorts

(Horton et al. 2005). If this is true, then knowledge of these students' personality types may have implications for academic performance and the appropriateness of specific teaching methods. However, the contradictory nature of the research in to the relationship between personality and learning styles and academic behaviour, which has spanned more than four decades, suggests that a simple relationship will not be found. Therefore it is more likely that what will be found will be a complex interaction between individual student characteristics, their previous learning experiences and a specific educational context.

In the following section Jung's theory of personality and types in relation to cognitive processes and behaviour is discussed. This discussion extends the interpretation of the Myers-Briggs Type Indicator (MBTI®) beyond the popular sixteen types (please refer to Appendix A) to explore the cognitive processes that are said to shape individual differences within each of the sixteen types. Additionally, the temperament theory is explored, an interpretation of personality that gained popularity through the publications of Keirsey and Bates (1984). Jung's theory is therefore explored in considerable detail and this is done because it is a highly complex theory, which can be interpreted in widely different ways. This has meant that studies which use only one approach can provide inconclusive results. Thus if a study finds no relationship between students' MBTI results and their learning behaviour (Belanger 2001) it is not clear whether this demonstrates this demonstrates the absence of a relationship between these factors or the inappropriateness of the interpretation used in the study.

2.3.1 Background

Whilst the term "personality" is derived from the Latin term 'persona' which can be translated as 'mask' (Kassin 1995), the modern view of personality is that it plays a more influential role on behaviour than this implies. In contrast to a mask that can be put on and taken off, personality is now recognised as a disposition that determines action and behaviour. This disposition is likely to remain relatively stable throughout the lifespan (McCrae and Costa 1999) and momentary adaptations do not appear to influence the person's core personality in the long term. Personality theories have, therefore, sought to

analyse and understand the key factors that are responsible for the uniqueness of an individual and the impact this has on behaviour.

Jung (1875-1961), a Swiss psychiatrist, was a pioneer in the field of psychological research. Interested in the development of the human mind his theories dealt with the conscious and unconscious aspect of an individual. He collaborated with Freud (1856-1939), a better known theorist in the field of personality, but whose work is now less influential than Jung's. The role Jung allocated to the individual, and his view of the 'complete personality' is at the core of personality development as it is known today and applied in this study. In his view, a person needs to focus on creating awareness of conscious and unconscious forces in order understand oneself and function effectively in all aspects of life, including education.

His theory of personality has attracted considerable attention and forms the basis for instruments such as the Myers Briggs Type Indictor (MBTI®), the Keirsey Temperament Sorter and other less well accepted and validated instruments. Moreover, these instruments have been used in educational research within a range of different educational contexts. In the following section Jung's theory and the way in which the MBTI® has been used in previous research are explained.

2.3.2   Jung's Psychological Types

This section explores the Jungian functions in their original form and the way in which these can be used to understand personality and individual differences. This will then lead to a discussion of the work of Myers and Briggs Myers and the development of the Myers-Briggs Type Indicator, the instrument used to quantify Jung's theory.

Jung explained differences between individuals by focusing on their personalities and attempted to create categories in order to understand and explain human behaviour. He defined two different attitudes towards the environment, or energy orientations – *Extraversion (E)* and *Introversion (I).* Jung (1971) saw extraversion as focussing on the outside physical world and interacting with it, whereas for introversion the preferred

interaction was with the individual's inner mental world. It should be noted that people's every day interpretation of these terms is not congruent with Jung's initial understanding, although similarities can be found.

The notion of extraversion and introversion as primary personality traits is now commonly accepted and the dimensions are central to Eysenck's theory (Eysenck and Eysenck 1964) and more recently to the 'Big Five' personality theory (McCrae and Costa 1999). It should, however, be noted that these terms are defined differently in each of these theories and are not discussed in more detail in this thesis as they are not seen to be relevant for the current study.

In order to explain the complexity of a person's personality, a theory requires more than a single dimension and, according to Jung, extraversion and introversion explain only parts of human behaviour. The energy orientation, however, has a major influence on the other functions Jung defined in his work.

Thus, in order to understand personality, Jung introduced four basic cognitive functions, two of them being *Perceiving (P)* functions, the other being *Judging (J)* functions. Perceiving functions are the two basic ways in which individuals access information about the environment and understand the world. One way is through *Sensing (S)*, the other through *Intuition (N)*. A person with a *Sensing* preference tends to use the five senses to access information and as such focuses on the present and tangible environment. A person with an *Intuition* preference tends to focus on the future, potential relationships or patterns in the information accessed and potential consequences thereof.

The two Judging functions are *Thinking (T)* and *Feeling (F)*. These functions express preferences for how information is accessed, analysed and used to make decisions. *Thinking (T)*, as a function, describes a process of applying logic and rationality to this decision making process, whereas *Feeling (F)* involves the inclusion of subjective values and social relationships in the decision making process.

As depicted in Figure 2.1 below, each of these four functions is subdivided into Extraverted and Introverted attitudes. A combination of these bi-polar dimensions produces eight key behaviours which are commonly known as the Jungian functions.

Figure 2.1: Jung's cognitive functions, adapted from Briggs Myers (1999)

Information-Accessing Processes		**Organising-Evaluating Processes**	
Perceiving		Judging	
Sensing (Se)	Intuition (Ne)	Thinking (Te)	Feeling (Fe)
Extraverted		**Extraverted**	
Sensing (Si)	Intuition (Ni)	Thinking (Ti)	Feeling (Fi)
Introverted		**Introverted**	
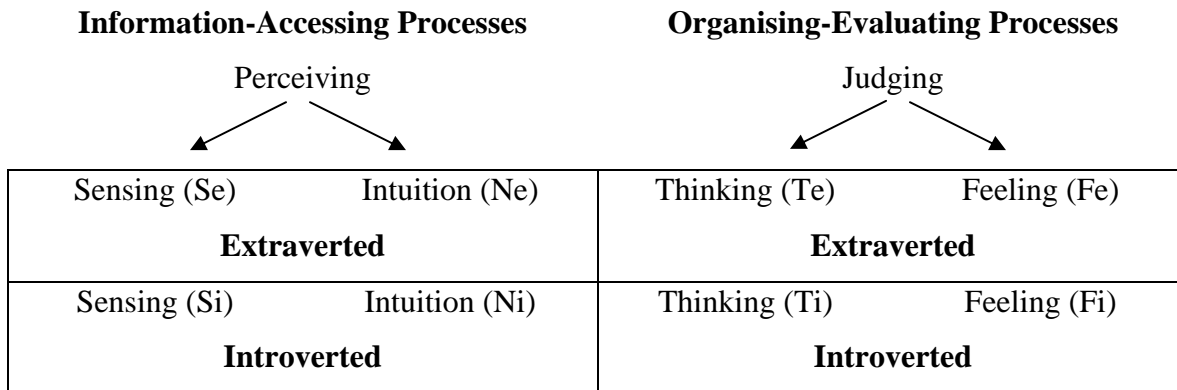
According to Jung (1971) these eight functions are used by individuals each day in order to interact with the environment, access, analyse and interpret information and finally make decisions using this information. Thus observable differences in individuals (i.e. their personality differences) occur because of different preferences for these functions. This means that people become particularly skilful and comfortable with using a certain function and, as a consequence, this function becomes the overt and dominant function. Similarly, people may struggle to use some functions and these are therefore avoided whenever possible. Thus, according to Jung's theory, the variety and distinctness of observable personalities can be attributed to the preferential use of these cognitive functions.

Before exploring the Jungian functions in more detail and elaborating on the effect the dynamic functions have on an individual's behaviour, it seems appropriate to introduce the instrument most frequently used to measure these functions. It is noteworthy that Jung himself was not interested in quantifying his theory or empirically testing it but its potential has been recognised by others. Therefore, the Myers Briggs Type Indicator (MBTI®), as it is known and applied today, is based on Jung's theory but is not his product. The development of the MBTI® will now be briefly discussed. Then, the type

codes used by the MBTI® to organise personality types will be related back to the Jungian functions.

2.3.3 MBTI® Inventory Development

Two American women, Katharine Cook Briggs (1875-1968) and her daughter Isabel Myers (1897-1980) were interested in human personality. As a consequence, they recognised the potential of Jung's theory of Personality and Psychological Type and began applying this knowledge in "type watching" their friends and families over a 20 year time span. During this time, they operationalised Jung's theory and developed the Myers Briggs Type Indicator (MBTI®). At first, the focus was on creating a practical application of Jung's theory and therefore the eight Jungian Functions described above formed the basis of the instrument. Soon, Briggs and Myers Briggs found that the eight functions did not sufficiently explain personality differences. Based on the findings of their longitudinal study, a fourth dichotomy was added. Grounded in Jung's understanding of *Judging* and *Perceiving* processes, as described earlier, their fourth dichotomy expresses how an individual prefers to deal with the external world and whether they rely on judging processes or perceiving processes.

Individuals with a *Judging* preference are said to have an ordered approach to life and to be guided by a desire to achieve closure. This desire is reflected in the way daily activities are approached, particularly in their sequential way of dealing with tasks. The *Perceiving* preference, on the other hand, involves the desire to remain open to alternative options and opportunities. This preference may be reflected in an 'unordered' approach to tasks and may be perceived as 'chaotic' because tasks are not necessarily completed in a sequential and orderly manner.

The addition of the fourth function doubles the original number of Jungian types and leads to sixteen types which can be used to explain personality. Table 2.1 (page 25) provides an overview of the four dimensions and the key characteristics associated with each pole of the dimensions.

Table 2.1: Myers-Briggs dimensions and key characteristics

Focus and Energy	
Extraversion (E)	**Introversion (I)**
Energised and stimulated by other people	Energised by solitude
Turn outwards for ideas	Turn inward for ideas
Prefer action	Prefer introspection/reflection
Focus on the outer world	Focus on the inner world

Information Gathering	
Sensing (S)	**Intuition (N)**
Focus on present/status quo	Focus on future/potential
Observant	Imaginative
Likely to be a deductive reasoner	Likely to be inductive reasoner
Impatient with wild and creative schemes	Impatient with details and routine
Reality is important	Possibilities are important

Decision Making	
Thinking (T)	**Feeling (F)**
Objective and logical	Subjective and situational
Not likely to consider impact of decision on other people	Very likely to consider how everyone feels about a decision
Are offended by someone's perceived inability to think logically	Are offended by someone's perceived lack of sensitivity

Organisation and Closure	
Judging (J)	**Perceiving (P)**
Tend to be inflexible	Tend to be adaptable
Like things settled	Like things open
Do not like loose ends	Do not mind loose ends
Concerned with being correct	Less concerned with being correct
Will make schedule or list and stick to it	May make schedule or list but have difficulties sticking to it
Are driven to organise and regulate	May be perceived as unorganised
Like to see issues as black or white	Accept shades of grey for solutions

adapted from Briggs Myers, McCaulley, Quenk and Hammer (1999)

Much of the popularity of the MBTI® may probably be attributed to its apparent simplicity and use of the four letter code (E/I-S/N-T/F-J/P) which can be easily understood by a wide range of people. Hence, most users employ these to explain

individual differences. However, in spite of its attractiveness, this may be too simplistic an approach to personality and disregards the complexity of Jung's theory.

As Berens (2000) points out, the popularity of the MBTI® has been accompanied by confusion with the underlying theory and she argues that many practitioners misinterpret the MBTI®. Most of the MBTI® applications today seem to be driven by a desire to label and stereotype. Whilst classifications and taxonomies can be useful for understanding individual differences, it should be remembered that Jung was not an advocate of classification. Indeed he described a classification of human beings into psychological types as inadequate (Jung 1971), with reference to his understanding of type dynamics, or development. Thus, it is suggested that the appeal of the MBTI® should lie in its applicability to different contexts and the fact that classifying individuals can enhance self awareness as well as being a catalyst for developing an understanding of others. The fact that Myers and Briggs (Briggs Myers 1999), developed the *Judging-Perceiving* dichotomy to help access the dynamics of cognitive processes not to label individuals further supports this argument.

Therefore, many of the current conceptual criticisms of the MBTI® may be caused by a deficient understanding of Jungian theory and an inappropriate use of the instrument (Harvey 1996). If the results from the MBTI® are interpreted in the way Myers and Briggs intended, the type code represents a pattern of how the eight cognitive processes are used: extraverted sensing, introverted sensing, extraverted intuition, introverted intuition, extraverted thinking, introverted thinking, extraverted feeling and introverted feeling. It would appear that, in order to create a complete, yet dynamic picture of a person's personality, an understanding of the individual processes is vital. Only then can the dynamics and roles the processes play in everyday life be fully understood.

2.3.4   The Eight Functions (Jungian Processes)

Jung described four cognitive processes that are said to inform every mental process. Furthermore, each of these cognitive processes is either extraverted or introverted, making eight processes. In this section some common characteristics associated with the cognitive processes will be described. The descriptors below are not meant to be mutually exclusive but to give some insights into basic differences which discriminate type.

Extraverted Sensing (Se) - The extraverted sensing process is momentary and usually focused on the present. It is characterised by a quest for processing the physical world and scanning for reactions and relevant data and helps the individual to adapt to this real world and to immediate situations. Extraverted sensing occurs when people scan for information relevant to their interests or tasks (Berens 2000). This seeking of information proceeds until the collected details can be combined to form a solution or a clear picture. In a learning environment, extroverted sensing is often demonstrated by continuously asking for specifics and extensive reading lists.

Introverted Sensing (Si) – This function, similar to other introverted functions, may be difficult to detect or may be misinterpreted. Generally, the mental processes of recalling past experiences or detailed data and the linking of these to concepts and ideas are characteristic of introverted sensing. In contrast to the extraverted sensing function, immediate experiences are not simply experienced and enjoyed, but rather compared to previous sensations, in order to detect differences and inconsistencies. In a learning environment, this recalling of previous sensations is often vital for the learning process and includes questions such as "What have I previously learned that I can build on?" or "What resources and materials are available?"

In a learning environment the sensing functions can be evident through students' focus on practical applications of the material, and the immediacy of the curriculum to students'

preferences. Further, requests for the provision of study resources and learning material are characteristic (Lawrence 1997).

Whilst sensing tends to involve looking for meaning in facts, intuition is a function closely linked to the search for, and inclusion of, abstract information in the cognitive processes. As such, images, symbols and conceptual patterns are interpreted to form the 'big picture' and make contexts comprehensible.

Extraverted Intuition (Ne) – this function involves presenting alternative interpretations and questions previously established solutions. The aim is to make inferences and scan for what could be (future oriented). The individual tends to juggle numerous potential solutions, meanings, views and arguments in their mind, all of which could be true. Thus, extraverted intuition seems to be less about finding an ultimate truth, and more about discovering possible truths (Berens 2000). Students with an extraverted intuition dominant function may have difficulties accepting a presented solution and may wish to engage in arguments with teachers and peers about alternative solutions.

Introverted Intuition (Ni) – The experiences derived from introverted intuition are often described as 'psychic'. Although the intuition function may conceptually be related to a 'sixth sense', there is no evidence that Jung interpreted it this way. Introverted intuition often uses symbols and interpretation which may be idiosyncratic to the individual. According to Berens (2000) the internal focus of the intuitive function promotes the use of symbolism to assist in conceptualisation and understanding. Unlike extraverted orientation, the aim of introverted intuition is not a sharing of findings but a gaining of personal understanding. In a learning setting, this individual interpretation can help students to understand complex phenomena. Although, this learning process appears beneficial for students, evaluation of the learning process can be difficult, unless students are able to spontaneously communicate these learning outcomes or the instructor uses assessment techniques which allow students to demonstrate this type of learning.

In a learning setting, the *Sensing* preference tends to be expressed by the request of students for practical applications and experimentation whereas students with an *Intuition* preference may challenge the conventional through imagination (Lawrence 1997).

The second set of the dynamic combinations are the judging functions of *Thinking* and *Feeling*. These dimensions express preferences for organising and evaluating information and using this information to make decisions.

The *Thinking* dimension refers to the process of evaluating information and making decisions on an objective basis. Examples of the cognitive process of thinking are reasoning, cause-and-effect determination, logic and analysis.

Extraverted Thinking (Te) – The thinking function helps an individual to organise the environment. When extraverted, this function is demonstrated by a liking for graphs, charts, diagrams, tables, outlines and the visual interpretation of material. In written or verbal communication, extraverted thinking can be demonstrated by a systematic and organised use of logic. As a consequence, inconsistencies are noticed when these affect the logic of an argument (Berens 2000). In a learning setting, this function can be expressed through a quest for structure and organisation in the learning process as well as a demand for logical consistency when content and arguments are presented. In fact, the entire learning process should 'make sense' to the learner, that is, it should be logical.

Introverted Thinking (Ti) – The introverted energy orientation of the thinking function is similar to extraverted thinking in terms of its preference for analysis and categorisation. The main difference is that internal cognitive processes are not necessarily made public and, if they are, a lot of energy can be spent finding the right word to express an idea precisely. The internal reasoning process is also used to cognitively deconstruct concepts or models to find out how they work. Often, this analysis is done by looking for inconsistencies (Berens 2000). The use of models and concepts tend to be favoured in a learning environment. Therefore, students with this preference are more likely to ask for underlying concepts and may form and use models to help them understand the learning

material. This learning preference may be favourable in settings where the content is of an abstract but logical nature and where the learning focus is on inference and deduction.

The second judging function, *Feeling,* involves evaluating information and making decisions based on subjective values and focuses on interpersonal consequences.

Extraverted Feeling (Fe) – This function is demonstrated by a consideration for others and responding to them appropriately. Often, the process of extraverted feeling seems to involve a desire to connect with, or disconnect from, others and is often accompanied by self-disclosure. In conversation extraverted feeling is demonstrated by encouraging others to talk about themselves and self-disclose. This process of social interaction is easily observed by others and often sought by peers. Further, Berens (2000) argues that extraverted feeling brings with it the flexibility to easily disconnect from people and adapt to a new social circle. In a learning setting, extraverted feeling can be expressed by the desire to work with others. The extraverted feeling learner might ask himself/herself a question such as: Who can I connect with, or relate to in order to learn better? They may even assess the value of academic content on the basis of its usefulness for improving relationships.

Introverted Feeling (Fi) – In this function, the cognitive process is guided by personal values. These values are the result of subjective evaluation by the individual and not always compatible with the environment. The strength of a person's values acts as a filter for assessing the environment and social relationships develop if another's values are deemed congruent. Further, actions tend to be favoured rather than words for expressing feelings. This, according to Berens (2000), is the result of the internal focus of this function. In a learning environment, introverted feeling allows students to assess the personal importance of the learning content. Furthermore, students may accept or reject a learning mode based on whether or not it fits with their value system (that is, is it fair?). The focus on interpersonal relationships can also influence students' assessment of teachers and their teaching effectiveness.

As previously mentioned, individuals appear to use all eight functions, although not equally well. In fact, each individual has a preferred function and a least preferred function. The other six functions have a hierarchical order in terms of the extent to which they are used. The most obvious and observable function is the one that typically defines a person's personality. However, referring back to Jung's view of personality, the use of one single function to explain personality is clearly too simplistic but the eight processes or functions together determine personality. This is referred to as the *Type Dynamics* or the *Hierarchy of Functions* where the eight functions are distinguished as being *Primary Processes* or *Shadow Processes*. This distinction is based on Jung's understanding of the psyche and the existence of a 'shadow' or part of people's personality, of which they are unaware but nonetheless influences their behaviour.

In current applications of Jung's theory, the main focus is on the primary processes, because it seems contradictory to Jung's theory to seek to validate the existence of a shadow-self through empirical evidence. Also, given that the shadow exists beyond a person's immediate awareness, self-report instruments such as the MBTI® appear inappropriate measurement instruments. Interestingly, the shadow processes do not appear to have been included in previous empirical studies in an educational setting, which could suggest their limited ability to explain learning behaviour. These processes are not evident in daily life, and only become influential under specific circumstances, such as unexpected pressure, personal hardship, and emotional instability. It thus seems appropriate that studies investigating student' learning behaviour would not include the shadow processes as relevant.

The theory of type dynamics has been used to answer the question "Why do individuals differ even though they express a similar set of preferences?" In response, Jung's theory states that these preferences are inherited and that type, as an expression of these preferences, does not change over time. Individuals claim, however, that their behaviour changes and that over time they become more comfortable with a range of situations. In practice, individuals who express a preference for introversion (an orientation towards the self and the inner world) may claim that, over time, they experience less difficulty in

dealing with the outer world. This apparent change can easily be mistaken for a change in personality, but in fact it is an outcome of Type Dynamics, or Type Development.

The concept of Type Development seems important when considering the impact of personality in an educational setting, where development is often driven by maturation. When focussing on a sample group of students in a higher education setting, it may be inappropriate to assume that respondents are at similar stages of type development. Whilst the MBTI® clusters personality into 16 discrete groups, the theory of type dynamics ranks four main functions in preferred order from the dominant (most preferred), through to the inferior (least preferred) function, along with four shadow functions. Each of the four primary processes derived from the preferences expressed in the MBTI®.

The dominant function appears inborn and represents the most preferred and innate function of a personality. It is detectable from early childhood and has the strongest influence on a person's behaviour. This function tends to be used first to respond to situations, as it is the approach which people are most comfortable with. It is used almost effortlessly and seems to come naturally. The reliance on this function provides a person with some sense of security. However, it can become inappropriate if the dominant function is at variance with the requirements of the situation. A person's awareness of this function is usually well developed and it can therefore be inferred that self-report instruments such as the MBTI® should measure this function well.

The auxiliary or second most preferred function is said to determine the way people interact with their environment and balances the dominant function in the external world. This function usually develops during early adolescence. At this stage young people start to recognise that, in order to become socially effective, they need to respond in different ways depending on the context. Thus they are unable to rely on their dominant function only. This process is seen by Jung to be motivated by people's quest to find their niche in society (Jung 1971).

The tertiary or third preference function is also known as the relief role since it provides a mechanism by which a person can be recharged and energised. When young, this process is used less, and only if really required. In early adulthood, it appears that people are attracted to activities that support the development and use of this function. It is said that people discover their creativity through the development of this function (Fitzgerald and Kirby 1997).

Finally, the inferior and least preferred function is the opposite of the dominant function in both energy orientation and cognitive process. Although the inferior function is always present, its existence is rarely acknowledged and the ability to use it constructively appears to develop around mid-life. Normally, this function remains underdeveloped and as such its influence is often negative. As people learn to trust and develop their inferior function, it enables them to balance their dominant function and to achieve greater equilibrium in their life.

The other four processes, the shadow processes, operate outside people's awareness and surface only in rare circumstances. As an outcome of the low level of awareness, they usually seem to be underdeveloped, and in most cases are likely to influence a person in a negative way (Berens 2000). It would appear that an awareness of the shadow functions only develops in the later stages of life further evidencing that they would not be relevant to research with university students.

In terms of the primary processes, it should be acknowledged that all four functions are present at all times and that with development comes awareness of these functions. Table 2.2, on page 34 provides an overview of the sixteen personality types as constructed by the MBTI® and their associated dynamic functions.

Table 2.2: Dynamic functions of the MBTI personality types

The 16 Type Patterns	The Primary Processes				The Shadow Processes			
	1st *dominant*	2nd *auxiliary*	3rd *tertiary*	4th *inferior*	5th	6th	7th	8th
ESTP	Se	Ti	Fe	Ni	Si	Te	Fi	Ne
ESFP	Se	Fi	Te	Ni	Si	Fe	Ti	Ne
ISTJ	Si	Te	Fi	Ne	Se	Ti	Fe	Ni
ISFJ	Si	Fe	Ti	Ne	Se	Fi	Te	Ni
ENTP	Ne	Ti	Fe	Si	Ni	Te	Fi	Se
ENFP	Ne	Fi	Te	Si	Ni	Fe	Ti	Se
INTJ	Ni	Te	Fi	Se	Ne	Ti	Fe	Si
INFJ	Ni	Fe	Ti	Se	Ne	Fi	Te	Si
ESTJ	Te	Si	Ne	Fi	Ti	Se	Ni	Fe
ENTJ	Te	Ni	Se	Fi	Ti	Ne	Si	Fe
ISTP	Ti	Se	Ni	Fe	Te	Si	Ne	Fi
INTP	Ti	Ne	Si	Fe	Te	Ni	Se	Fi
ESFJ	Fe	Si	Ne	Ti	Fi	Se	Ni	Te
ENFJ	Fe	Ni	Se	Ti	Fi	Ne	Si	Te
ISFP	Fi	Se	Ni	Te	Fe	Si	Ne	Ti
INFP	Fi	Ne	Si	Te	Fe	Ni	Se	Ti

Adapted from Berens (2000)

It would appear that type dynamics may help explain learning outcomes because of the apparent relationship between the type functions and learning behaviour. This argument is based on the understanding that whilst type develops as an individual matures, knowledge of a person's developmental stage may assist that person to become a more competent learner. Whilst Jung explored type development in order to understand the way in which adult personality develops, it has been suggested that the active

implementation of type dynamics may contribute positively to students' academic development and performance (Whitelaw and Gillet 2004). Therefore, type dynamics may play an integral role in the acceptance or rejection of ICT. This is because using technology has become a requirement for transmitting information, that is, learning and assessment.

2.3.5 Temperament Theory

An alternative way of understanding personality within the broader Jungian perspective is provided by Keirsey and Bates (1984). Their framework of temperament has become a popular alternative to the extensive MBTI®. This is probably due to its open availability as opposed to the MBTI® which is a commercial instrument and may only be used by psychologists and trained administrators. Popular publication such as *Please Understand Me: Character and Temperament Types* (Keirsey and Bates 1984) and *Please Understand Me II* (Keirsey 1998) may also have contributed to the success of the model.

Keirsey (1984) advocates a clustering of personalities by combining Intuition (N) with the two Judging functions (Thinking and Feeling) and Sensing (S) with the two orientations to the outer world (Judging and Perceiving) similar to an understanding of temperament that reaches back more than 2500 years to Plato and Aristotle. Using these combinations, temperaments are constructed with a focus on an individual's core needs, values and talents (Briggs Myers et al. 1999) and are an expression of action that is guided by underlying needs (Dunning 2003). In this theory, the four temperaments are described as: Artisans (a combination of *Sensing* and *Perceiving* preferences - SP), Guardians (a combination of *Sensing* and *Judging* preferences - SJ), Idealists (a combination of *Intuition* and *Feeling* preferences - NF) and Rationals (a combination of *Intuition* and *Thinking* preferences - NT).

Given the assumed relevance of these constructs to an educational context, in the next section a summary of key characteristics of the four temperaments, as they are commonly referred to in the literature (Keirsey and Bates 1984; Keirsey 1998; Dunning 2003) is provided:

The Artisan (SP)

The artisan student appears to seek physical involvement in the learning process, and to favour a hands-on, experiential learning environment. Generally, these students enjoy being entertained, so forms of multimedia presentations as well as simulations and videos may suit them. SPs seek variety in their life and this is likely to be reflected in the classroom. They can easily become bored and may even become disruptive. Hence, a traditional didactic lecture, workbooks or end-of-chapter questions may not appeal to SP students. Artisans tend to avoid highly structured learning approaches and may prefer a learning environment that is spontaneous, exciting and flexible. The SP student is likely to adopt a kinaesthetic or experiential learning approach which involves carrying out a physical activity. This seems likely to be preferred over more cognitive focussed learning approaches. The SPs' short-term focus and need for immediate application and gratification may mean they respond well to learning environments that accommodate their need for reality and sense of purpose. Open-ended activities and goals can be used as motivators. An Artisan appears most likely to excel in studies where assessment tasks have a practical component and appear relevant to industry. It appears likely that Artisans will be challenged by academic reading, particularly when practical application is not obvious, and preliminary analysis is required for learning.

The Guardian (SJ)

The temperament of an SJ appears to incorporate the quality needed for a traditional lecture-based learning environment. SJs respond to a structured approach in learning and sequential delivery of subject content. They seem to like classroom discussions when these are well structured and managed effectively by the lecturer. SJs are more likely to request clear and concise instruction to assignments if they are to perform well. Learning facts and technical components of a course may suit the Guardian student, but conceptualising, improvising or abstract thinking do not. SJ students tend to approach their work in a well-structured manner, and therefore it is suggested that they do better if the work is presented to them in such a way that it accommodates these preferences (Horton 1991). They have a strong sense of right or wrong, based on their previous

experiences. A preference for completing tasks according to clear guidelines makes Guardians receptive to modelled answers. This way, they can compare their work to an expected standard and make the necessary adjustments to their own work.   The memorising approach to learning, favoured by these students, may mean the SJ students prefer multiple choice tests or other types of assessments which measure factual knowledge.

The Idealist (NF)

Idealists appear to prefer a classroom setting that is democratically run and equitable. Group work is likely to be enjoyed, provided it is cooperative not competitive: competitive environments appear counterproductive for Idealist students. NF students tend to have well developed communication skills and therefore perform well in class discussions and in written work, especially when a strong personal perspective is required. Other more factual types of assessments, such as multiple choice tests, may not be preferred because they do not allow them to express their viewpoint. The Idealist students tend to value personal recognition over grades and see learning as an opportunity for individual growth. They are also likely to support peers that struggle with a task. Abstract thinking can be appreciated by the NF student, provided it is seen to be personally meaningful.

The Rational (NT)

NT Learners tend to be independent learners and can be comfortable with a logical, didactical presentation of material and are likely to challenge the teacher in terms of subject content. They tend to become impatient with an emphasis on detail. The Rationalists tend to look for expertise in the teachers and they are more likely to interact with them in preference to their class members, as their ability to focus on other people is generally less developed. NTs learn by trying to achieve understanding, and asking 'Why?' is a common part of their learning process. Information is processed by evaluation, analysis, reflection and integration. A structured approach to learning may be less important for the Rationals, provided that the material is challenging and the

information credible. If answers to the 'Why?' question are unclear, or the teacher's expertise is doubted, the NT student may dismiss the content.

Although Keirsey's theory (Keirsey and Bates 1984; Keirsey 1998) allows for a division of the temperaments into the eight and then into the 16 subgroups, as finer distinctions are made between temperaments, the number of joint characteristics increases and thus the differences blur. The common approach in practice is to use the four temperaments (SJ, SP, NF, and NT) and sometimes the eight sub-temperaments to understand personality differences. The use of sixteen temperaments seems to diminish the clarity that has made Keirsey's theory so popular.

The strong similarities between the Jungian construct (and subsequently the MBTI®) and Keirsey's temperament construct have been the focus of several studies (Berens 1985; Jackson, Parker and Dipboye 1996) and generally the two constructs are used interchangeably. This is encouraged by the fact that the same terminology is used in both theories (Team Technology 2000). It is important to note, however, that temperament theory is not a variation of type theory or vice versa, but is an independent framework. As Berens (1985) pointed out, there are quantifiable differences between the MBTI® and Keirsey's temperament construct, although these differences are perceived as minor and attributable to methodological approaches in individual studies.

Thus, the research literature suggests that the distinctive differences in the two schools of thought are conceptual in nature and related to fundamentally different interpretations of personality rather than based on empirical differences. In Jung's theory, for example, extraversion and introversion are defined as major defining components of personality. Keirsey, on the other hand, acknowledges the importance of the extraversion/introversion influence, but sees that 'Sensing' and 'Intuition' are the main personality dimensions which explain behaviour. This distinction is likely to have important implications for educators in terms of the way in which they present educational concepts. Furthermore, within the Jungian framework, types are descriptions of mental patterns that eventually result in observable actions, whereas Keirsey's temperaments are generally understood as

descriptions of activity patterns (BSM Consulting 2000). Finally, whilst Jung and Keirsey assume that type and temperament are inborn, Keirsey disagrees with the Jungian theory of type dynamics. In his view, temperament is a static concept that determines action and behaviour throughout an individual's life (Keirsey and Bates 1984). Jung, on the other hand, allows for the development of the less dominant functions during the lifespan.

Despite these differences, in practice both theories tend to be used interchangeably and each acknowledges the value of the other's approach. Thus, Briggs Myers dedicated a chapter of the MBTI® manual to the temperament theory, and acknowledged that, whilst the constructs differ, Keirsey's concepts resemble other MBTI® constructs (Briggs Myers et al. 1999). Similarly, in *Please Understand Me II* Keirsey referred to Jung and the work of Myers-Briggs as the theoretical construct from which the temperament theory evolved (Keirsey 1998). Moreover, an inspection of the instruments reveals that Keirsey's temperament sorter is very similar to the MBTI® questionnaire in terms of the content, and its use of the same dimensions as the MBTI® makes it difficult to argue conceptual differences in the two instruments.

Kroeger and Thuesen, leading researchers and publishers of type-related studies, have attempted to provide a theoretical framework to allow researchers and practitioners to combine the Jungian typology and the Keirsey temperament constructs (Kroeger and Thuesen 1998). They clearly value the contributions Keirsey and Bates have made to the increasing knowledge and understanding of the practical applications of personality research (1998). At the same time, they criticise the model for its simplicity and inability to compete with the more detailed personality construct of the MBTI®.

In practice, Keirsey and Bates arrange individual temperaments into NF, NT, SJ and SP but none of their published work provides an adequate explanation for why the alternate combinations of SF, ST, NJ and NP are not identified as temperaments (Kroeger and Thuesen 1998). Whilst Keirsey (2005) argues that the differences between SF and ST are too minor to be valid, this argument needs further developement.

Individuals with a Sensing preference have a 'hands-on' approach and are attracted by action, rather than decisions, whereas individuals with an Intuition preference like abstract concepts. This does not mean that they are not interested in implementing their abstract ideas in the outer world (J or P), but they are interested in decisions about right or wrong, good or bad (T or F). Hence, an SFP differs more from an SFJ than from an STP. Similarly, an NFJ can clearly be distinguished from an NTJ, but is not so distinguishable from an NFP. The decision about the grouping of the temperaments is a decision based on a hierarchy of functions. This argument, and the lack of acknowledgement from Keirsey's side on the impact energy orientation has on personality, is the most important criticism of his work.

As this discussion indicates, both personality constructs, the MBTI® and Keirsey's temperament sorter, appear to provide alternative and valid interpretations views of individual differences. Moreover, both appear relevant for any educational research which seeks to understand those factors which may play a role in enhancing or interfering with learning.

2.3.6   Personality in the Classroom

Although personality theories have been used to explain individual differences in contexts such as team building (Bradley and Hebert 1997), mentoring (Stromei 1998), staff selection and training (Mangham 1995), it is the educational forum that is of particular interest here. The amount of research in this area (Gardner 1987; Provost and Anchors 1987; Brymer and Pavesic 1990; Martin 1991; Guthrie 1993; DiTiberio 1996; Sparks 1997) demonstrates the extent to which researchers have attributed academic performance to personality dimensions. As has been indicated previously these findings are frequently contradictory. Thus some recent studies (Harackiewicz, Barron, Tauer and Elliot 2002; Farsides and Woodfield 2003) indicated the existence of a predictive relationship between personality and learning behaviour whereas other researchers have suggested that the best way to predict students' future behaviour is to use their previous behaviour (McManus, Smithers, Partridge, Keeling and Fleming 2003).

Whilst the foci of the various studies differ, they mainly seek to explain differences in educational behaviour in terms of personality and it appears that cognitive processes, which are shaped by personality, may under some conditions play an important role in explaining behavioural differences within an educational setting. The dilemma is being able to identify the contexts when personality factors may be either relevant or irrelevant. Current research into the impact of personality on academic behaviour focuses on issues such as student learning styles (Jennings-Golden and Provost 1987), whether similar personality profiles for students and teachers enhance student learning (Cooper and Miller 1991), the nature of the relationship between personality and academic achievement (Borg and Shapiro 1996; Borg and Stranahan 2002) and the relevance of understanding students' personality when designing the curriculum (Reynolds 1999). Most studies, however, seek to describe a particular student cohort rather than establish findings which have more general relevance. As a consequence, research is frequently repeated with different cohorts. Previous research would, however, suggest that at times there is a relationship between students' personality and his or her study approach (McCaulley and Natter 1980; DiTiberio and Hammer 1993; 1996; Lawrence 1997; Dunning 2003). Thus research undertaken by Cooper and Miller (1991) found that

students preferred an instructor with similar learning styles to their own yet evidence indicates that this does not have a positive impact on academic performance (DiTiberio and Jensen 1995) and learners may in fact benefit from having someone with an opposing style as this is more challenging (Entwistle and Tait 1990).

Provost and Anchors (1987) argue that the information receiving function (Sensing and Intuition) and the organising function (Judging and Perceiving) play an important role in explaining differences in information gathering, whereas the energy orientation (Extraversion and Introversion) and the decision function (Thinking and Feeling) determine the expression of learning. Therefore, it seems likely that the information receiving and organising functions may play a more significant role than the energy orientation and the decision function in relation to study approaches.

Heinstroem's (2005) study into the information seeking behaviour of research students, supported the notion that learning patterns originate in personality constructs. Moreover, these findings indicate the need to include measures of personality in future investigations of student's learning processes.

Few studies, however, have used personality to evaluate the effectiveness of a technology supported teaching and learning environment. One such study was conducted by Dewar and Whittington (2000) who used the MBTI® to investigate online learning styles and found that traditional concepts of personality-based learning styles (as previously discussed) were applicable to an online learning environment. These findings are encouraging and provide further justification for including personality measures in studies investigating the impact of technology on learning. It must, however, be recognised that Dewar and Whittington's study (2000) focussed on a learning environment that was entirely online and the sample size and type distribution was not representative and as such appropriate statistical analysis was not possible.

It should also be noted that Stokes (2001), in her study of course satisfaction within an online learning environment found that temperament and course satisfaction were not

related. She, therefore, concluded that a digital learning environment suits and accommodates students with all temperaments. Whilst this may be correct it needs to be noted that her sample was drawn from students who were enrolled in computer courses. Therefore this issue needs further investigation in order to determine whether this is a valid conclusion or whether students who were reluctant to adopt technology or feared a learning-teaching mismatch were not represented in this study. Secondly, the temperament data were collected as a required course activity, an approach that is highly discouraged in the literature (Briggs Myers et al. 1999). This is because it may increase the likelihood of responses to the questions reflecting perceived 'suitable responses' rather than the true personality of the respondents. Finally, the measurement of course satisfaction did not include attitudinal dimensions of system efficacy but focussed on technical issues such as: support availability, course structure and quality of the instructor and instructions (Stokes 2001). Thus, the attempt to define determinants of course satisfaction focussed merely on course components over which the teacher has control rather than individual characteristics of the user. The need for further investigation becomes increasingly apparent when these results are contrasted with those found by Percey (1997). This earlier study appeared to demonstrate that a relationship existed between learning style and preference for computer mediated training and found that Sensing (S) and Judging (J) individuals expressed a higher preference than did Intuitive (N) and Perceiving (P) types. The timing of these studies may, however, be relevant – by the 21st Century it is argued that most students have had considerable experience with a variety of different technologies and hence it is suggested that as familiarity with technology increases personality will have less relevance for learning involving technology as is suggested by Stokes's findings (2001).

In spite of the varying results, these studies demonstrate the usefulness of understanding the interrelationship between personality and learning preferences and the context within which the learning occurs. Moreover findings from previous studies do not provide researchers with any understanding of whether personality or temperament appears relevant for students' acceptance of technology in a blended teaching environment. Furthermore, whilst these studies provide some insight into the difficulties associated

with using learning preferences to explain students' academic performance they do not provide answers to issues such as whether learning styles have a different impact on different types of students or a different impact on the same students in different contexts.

Therefore, the last section of this chapter describes personality research that has been conducted with hospitality students. This focus is important, as some typological differences amongst academic disciplines have previously been identified, especially with this particular cohort (Gillet et al. 2005).

2.3.7   Hospitality Student Characteristics

The research literature suggests that an understanding of hospitality and tourism students can be a useful starting point for developing curricula and pedagogy that matches both the needs of the students and the industry they are intending to work in. Earlier research has tended to use findings obtained from the general field of learning styles, but anecdotal evidence and personal experiences suggest that hospitality and tourism students may have different learning styles from other groups of students. There appears, however, to be a dearth of empirical and comparative studies of students across disciplines.

In previous research studies, two main approaches have been taken to understand the personality and learning style of hospitality students. Although the anticipated outcome and application of these studies are similar, they differ in terms of underlying theoretical constructs. One type of hospitality research uses the learning styles constructs of Honey and Mumford and Kolb's learning cycle and the literature using this approach generally originates in the UK (Lashley 2002; Barron et al. 2006). The other approach argues that personality influences student behaviour and applies Jungian typology and the MBTI[®] operationalised personality. Interestingly, this research seems to predominantly originate in the US (Ziegert 2000; Borg and Stranahan 2002).

The Jungian typology (and subsequently the MBTI[®]) with its origins in psychology, has a more general focus, whereas the theories of Kolb (1971) and Honey and Mumford (1992)

have emerged from the discipline of education. These different theoretical origins may explain their different viewpoints on learning style development.

Kolb (1984), and subsequently Honey and Mumford (1992), advocated that their model not only allows for changes in learning style but that a development of learning styles is fundamental for the dynamics of the experiential learning cycle. In contrast, the Jungian approach perceives personality as a predisposition towards learning preferences that is relatively stable and does not tend to change over time. Thus it is unlikely that students will adopt a range of study approaches simultaneously within the Jungian concept, and when approaches other than the preferred ones are used, these require a substantially higher energy level.

Despite their theoretical differences, both approaches describe hospitality students similarly and thus, it appears that hospitality students need to:

1)   Develop some facility applying different learning approaches across a range of learning environments and learning tasks in order to become holistic, successful learners (Barron et al. 2006).

2)   Accommodate their extraversion tendencies in the classroom (Horton et al. 2005). Whilst this seems to be understandable, given that learners seem to perform better when their preferred learning style is accommodated, no suggestions are made on how this may affect the learning efficacy of introverted personalities. Instead, it would appear preferable for teachers to implement their knowledge of student learning styles in the classroom in order to create a balanced learning environment that takes different learning preferences into account and that in turn provides challenges and comfort across the student cohort (Swanson 1988).

Moreover, previous research suggests that hospitality curricula may need to take account of hospitality students' learning preferences. It has been suggested that the well-documented tendency of hospitality students towards activist approaches means that they

may require a curriculum that fosters the development of reflective skills rather than builds in hands-on experiences (Lashley 1999; Barron et al. 2006).

Applications of the MBTI® to hospitality education have found a predominance of ESTJ and ESFJ students (Kroeger and Thuesen 1988; Brymer and Pavesic 1990; Janson 1994). According to Myers-Briggs, the characteristics of these typologies indicate that both types have similar information and processing preferences. According to Kroeger and Thuesen (1988) the ESTJs are the 'life's administrators', whereas the ESFJs are the 'hosts and hostesses' of the world'. What distinguishes the two types from the other fourteen personality types is the way in which they focus on the outer world and their liking for involvement with other people. Both types also have a strong sense of structure and believe that tasks can be effectively accomplished by following established procedures. They are realists focussing on the present rather than the future or past. Both typologies are characterised by the openness to, and integration of, the external world- a reflection of the extraverted energy orientation that is dominant in both types. This strong representation of extraverted preferences is understandable, given that the industry involves customer contact, entertainment and communication with strangers. Also, whilst the industry is often described as fast paced, vibrant and dynamic, the reality is that the efficiency of hospitality operations is dependent on well-established structures and procedures for handling tasks, hence the appropriateness for 'S' and 'J' to be characteristics of students attracted to this industry.

2.3.8   Section Summary

This section endeavoured to establish the diversity of research findings, which deal with the relationship between dynamic functions and particular aspects of study such as classroom behaviour and task approaches. There appears, however to be a gap in the literature in terms understanding the relationship between learning styles and students' acceptance of teaching technology. This is seen to be relevant for a number of reasons. The use of technology is increasing and it is therefore important to understand students' reactions to it. Also understanding the nature of the relationship between the learning

styles of students and their behaviour in a specific learning context provides additional information on the complex relationship between learning styles and learning behaviour.

Personality offers different explanations for why we do what we do. Many of the currently accepted personality concepts are grounded in Jung's theory of psychological type and his eight functions form the basis of one of the most frequently used personality instruments: the Myers-Briggs Type Indicator (MBTI®). The chapter explored Jung's four cognitive processes and how, when paired with an extraverted or introverted energy orientation, these functions may influence behaviour. As discussed, personality is not about categorising people but about the interaction of individual processes and the role of dynamic functions as a determinant of individualism. Personality, from a temperament perspective, was also explained. The MBTI® has made Jung's theory accessible for broad application because it enables his dynamic functions to be measured. However, as discussed, the type code provided by the MBTI® is often misinterpreted and the theory often over simplified. Nevertheless, its applicability has appealed to researchers in a number of disciplines, including education and hospitality. Moreover, the literature reviewed in this section demonstrated a relationship between personality (as interplay of cognitive processes) and learning preferences. Also of interest was the fact that previous research confirmed that certain personality types are overrepresented amongst hospitality students and, as discussed, this has implications for teaching. Whilst the earlier sections of this chapter attempted to validate the need for additional research on typological representation, the following section introduces the Technology Acceptance Model (TAM) and discusses relevant literature pertaining to previous model applications and their perceived usefulness. After this model has been fully explained, the concept of personality will be integrated into the TAM.

2.4 Technology Acceptance Model (TAM)

The decision to invest in and use teaching technologies is often seen as a response to the constraints currently faced by higher education institutions (Laurillard 2002), but also reflects the increased accessibility of technology. In the past, a major restriction to the deployment of such technologies was access to t hardware or software and network connections. Nowadays, access is less of an issue and educational institutions tend to provide students with a broad range of access points to the technology. It therefore seems reasonable to assume that the success or failure of technology systems is increasingly determined by the user's acceptance of it, particularly in a blended learning environment. Hence, the important question raised by researchers, software developers and instructional designers alike (Swanson 1988) becomes "What makes users accept and adapt a certain technology?".

The Technology Acceptance Model (Davis 1989) provides a useful framework for understanding a learner's acceptance of a particular teaching technology. In this context, Dillon and Morris define user acceptance as "the demonstrable willingness within a user group to employ information technology for the task it is designed to support." (Dillon and Morris 1996, p. 6). In the following section, the original model is explained in detail and current applications are discussed and evaluated.

2.4.1 Model Development

The Technology Acceptance Model (TAM), developed by Davis (1989), endeavours to predict and explain the use and acceptance of technology. It is an adaptation of the *Theory of Reasoned Action* (TRA) developed by Ajzen and Fishbein (Fishbein and Ajzen 1975; Ajzen and Fishbein 1980) and is closely related to the *Theory of Planned Behaviour* (Mathieson 1991). According to the *Theory of Reasoned Action*, behaviour is determined by behavioural intentions. Behavioural intentions are a combination of an individual's attitude and some subjective norm. The original *Theory of Reasoned Action* has been widely applied, has produced a range of empirical research (Davis, Bagozzi and Warshaw 1989), and appears to be applicable to many situations. The TAM has been

constructed on the basis of this model and is specifically tailored for determining acceptance of technology.

This model, in its original form and in subsequent iterations (Venkatesh and Davis 2000) appears to have been successfully applied to a number of technologies and settings (Horton, Buck, Waterson and Clegg 2001). It is based on the notion that technology acceptance is determined by a number of variables, including:

1) *Perceived Usefulness* (U), which is defined as "the degree to which a person believes that using a particular system will enhance his or her job performance" (Davis 1989, p. 320)

2) *Perceived Ease of Use* (EOU), which refers to the "degree to which a person believes that using a particular system (technology) will be free of effort" (Davis 1989, p. 320).

3) *Attitude* (A), which is a value and belief that is expressed as a positive, negative or neutral view towards the system.

4) *Behavioural Intention* (FU), which is expressed as an anticipated action or inaction towards a system.

Figure 2.2 (page 50) shows the Technology Acceptance Model (TAM) in its original form and illustrates linear relationships between the variables described above. In addition, Davis et al. (1989) included 'External Variables' as additional factors influencing a person's acceptance of technology. These variables appear to be factors that influence someone's attitude towards a technology but are not directly related to the technology. These external variables could include for example, previous exposure to similar technologies, training received prior to the technology uptake, confidence in a technological environment or individual characteristics.
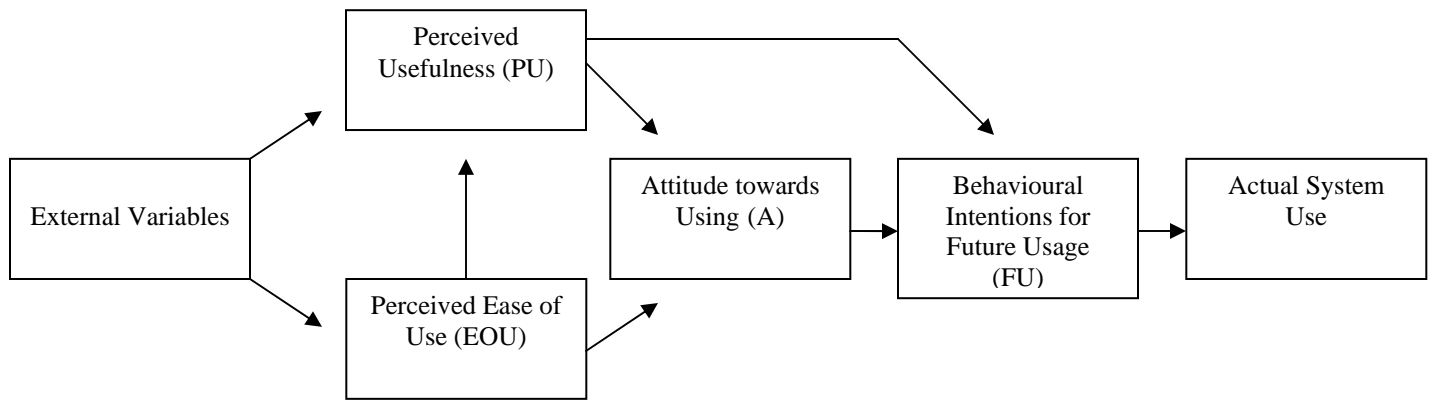
Figure 2.2: Technology Acceptance Model (Davis et al. 1989)

The individual relationships within this model are explained below.

As Figure 2.2 shows, this model resembles the *Theory of Reasoned Action* in that it stipulates that the actual use of a technological system is determined by *Behavioural Intentions* (FU). The *Behavioural Intentions* (FU), in turn, are determined by a combination of *Perceived Usefulness* (PU) and the *Attitude Towards Using* a particular system (A). The relationship between *Attitude Towards Using* (A) and *Behavioural Intentions* (FU) is based on the understanding that an individual's attitude towards a system may directly influence the intention to use such a system. Attitudes are shaped by perceptions and beliefs and usually, this relationship is relatively stable and linear. Thus, a positive experience and exposure to the system is likely to result in a positive attitude and vice versa. The relationship between *Perceived Usefulness* (PU) and *Behavioural Intention* (FU) implies that individuals in a specific contextual setting, such as education, form an 'intention to adopt' behaviour that they believe will enhance their performance (that is, academic grades). This 'forming of behavioural intention' is often initiated by extrinsic rather than intrinsic motivation and reflects a utilitarian approach towards performance - an approach which many higher education students may adopt. However, technologies are often imposed on individuals and behavioural intentions for usage are developed regardless of an individual's attitude towards a system. Thus, the nature of the relationships in the model needs to be understood within a specific context.

Finally, Davis (1989) included the *Actual System Use* in his model to show that a *Behavioural Intention* is expected to result in congruent behaviour. This is an important theoretical component of attitudes. It can, however be argued that a positive attitude towards a system does not necessarily lead to use of the technology.

Ease of Use (EOU) is seen to have a significant effect on *Attitude* (A). In fact, the TAM identifies two ways in which EOU influences attitudes and behaviour: through self-efficacy and instrumentality (Davis et al. 1989). Thus it can be argued, that the easier a system is to operate, the greater should be the user's sense of efficacy (Bandura 1982). Also, individuals who receive training appear less likely to be frustrated with the system and more likely to develop higher confidence in the system and a more positive perception of it (Igbaria and Zinatelli 1997). Similarly, an improvement in for example the handling and navigation of a technological system is thought to positively influence an individual's attitude towards the system. The relationship of *Ease of Use* (EOU) to *Behavioural Intention* (FU) is reported differently in the literature. This appears to be because of differences in settings in which the studies took place. Recent studies in an educational context (Cheung and Huang 2005; Drennan et al. 2005) support an indirect relationship as originally established. As mentioned earlier, the degree of choice individuals have in the use of a technology, may be a critical factor in the explanatory power of this relationship. Thus, Igbaria et al. (1997) found a direct relationship between EOU and BI, a fact that is inconsistent with Davis' theory (Davis 1989). This may be due to the fact that Igbaria et al. (1997) conducted the research in small firms, whereas most of the initial TAM studies focussed on larger firms. It is suggested that these contradictory findings may be credited to levels of training provided and that small business owners tend to have a more pragmatic approach in which the Ease of Use is ranked as more important as the Perceived Usefulness. However, these findings do not seem to be well established in other studies and more recent research has supported the original model in which EOU only has a indirect influence on BI through PU (Adams, Nelson and Todd 1992; Venkatesh and Davis 2000; Pituch and Lee 2006).

Thus, the TAM appears to have considerable value in educational settings. Furthermore, the model provides opportunities for advanced statistical analysis (Igbaria and Guimaraes 1995). It would appear useful, therefore, to explain in some detail recent applications of the model.

2.4.2   Application of the TAM

Researching the TAM appears to provide managers with valuable strategies for designing and implementing technology based systems (Davis et al. 1989; Szajna 1994; Green 1998; Venkatesh and Davis 2000; Horton et al. 2001). By January 2000, over 400 journal articles had been identified that cited the two articles which introduced the TAM (Venkatesh and Davis 2000). Burton-Jones and Hubona (2005) identified another 40 TAM studies between 2000 and 2003. Moreover, Landry, Griffeth and Hartmann (2006) indicate the appropriateness of the model for educational settings, and they argue that it represents a useful tool for measuring student reactions to a classroom management systems such as WebCT.

Previous research has also extended Davis' (1989) model in a variety of ways. Some researchers have focussed on individual characteristics and user differences in a variety of ways (Igbaria 1990; Compeau, Higgings and Huff 1999; Brown 2002; Ifinedo 2006), and have argued that individual characteristics significantly influence the acceptance of an information system. Moreover, Szajna (1996), Venkatesh and Davis (2000) Taylor and Todd (1995) and Igbaria et al. (1997) have suggested that the inclusion of individual characteristics such as external variables in the TAM may be useful for improving its explanatory power.   However, none of these studies has applied cognitive and behavioural preferences to the TAM. Table 2.3 (page 53) shows the key studies conducted which appear to validate possible external variables of the model.

Table 2.3: Summary of previous research - External variables to the Technology Acceptance Model

Author	Date	External Variables studied
Agarwal and Prasad	1999	Organisational role
		Tenure
		Education
		Experience
		Training
Brown	2002	Computer anxiety
		Educational level
		Computer literacy
Gefen and Straub	1997	Gender
		Culture
Igbaria et al.	1997	Intra and extra organisational factors
		Management support
		External training
Venkatesh and Davis	2000	Job Relevance
		Image
		Result demonstrability
Yi and Hwang	2003	Intrinsic motivation
		Self-efficacy
		Enjoyment
		Learning Goal Orientation

Whilst most previous studies have endeavoured to validate the existing Technology Acceptance Model and develop an understanding of the impact of certain external variables, the application of the model to a range of settings (including educational) has provided interesting results.

When developing a new system or application, practitioners initially need to determine as early as possible in the design stages, whether a system will be acceptable to its users. If it is not, then they need to diagnose the reasons why that system is not perceived as acceptable. Only when the latter issue is understood, can practitioners take corrective action to increase acceptance and improve its overall performance. A key challenge for practitioners in determining the acceptance in the early stages of introduction is the difficulty of communicating in a realistic and relevant way how the system will contribute to the individual's performance. Having *Usefulness* identified as a major component in the model, with its dual influence on the use of a technology, it seems crucial that this component is effectively communicated. This can be exacerbated by the

difficulties associated with empirically demonstrating benefits in the early stages of a system deployment. Although the early stages in the system development are the most difficult ones for identifying and measuring influencing factors, they are the stages where practitioners have the highest degree of flexibility in terms of changing the proposed system. Igbaria and Guimaraes (1995) and Igbaria et al. (1997) applied structural equation modelling to further advance the understanding of the way in which individual factors influence the TAM components. In both studies it was found that training plays an important role in the early stages of technology adoption. However, the research also found that the impact that *Ease of Use* (EOU) has on system usage decreases over a prolonged period of exposure (Adams et al. 1992). Drennan et al. (2005) shared this view and strongly suggested a strong focus on the design and implementation of training modules in order to develop the skills and ability to deal with computer errors, because these are the skills found to most significantly influence *Ease of Use* (EOU) and *Perceived Usefulness* (PU).

There also seems to be a view (Landry et al. 2006) that the key barrier to technology acceptance is its lack of user friendliness. Thus, an improvement in user friendliness might be seen as the key to success for technology systems. Hence, the major part of the resources in system development is spent on design and interface, in order to ensure a maximum degree of user friendliness. Similarly, successfully established systems are usually described as being highly user friendly and their success is often credited to this factor. User friendliness (as a descriptor for *Ease of Use* (EOU)) can therefore be seen as a key factor for technology acceptance, but it is suggested that it only partly contributes to the behavioural intentions for engaging in a technology (Davis 1989; Venkatesh and Davis 2000). In fact, most studies confirm that EOU has an indirect effect on *Behavioural Intentions* (BI) and that *Perceived Usefulness* (PU) is the key determinant of *Behavioural Intentions* (BI) (Igbaria and Zinatelli 1997; Drennan et al. 2005; Pituch and Lee 2006). This also indicates that the usefulness of a system is more important for determining user acceptance and should therefore be strongly emphasised when new technology is introduced. This is particularly important as it appears that individuals may be willing to engage in a particular technology although they do not find it particularly

user friendly (Wilhelm, Rodehorst, Young, Jensen and Stephens 2003). This may even occur when the user interface is perceived to be complicated, the graphics of poor quality, and the training time consuming. Thus, provided the perceived usefulness outweighs the lack of user friendliness, poor graphics and costs of training, the user may be willing to engage with the technology. However, perceived ease of use, good graphics and efficacious training, may not be able to compensate for a lack of usefulness in a system. Therefore, Landry, Griffeth and Hartmann (2006) suggest that, if educators want students to use a particular technology (such as WebCT), they should focus their primary efforts on the elements that the students perceive as being the most useful. Similarly, if educators want students to use certain elements of any educational support system, these elements should be integrated into the course and their importance communicated clearly to the students (Landry et al. 2006).

In order to contrast the efficacy of the system and its user friendliness, the researcher developed the following acceptance matrix shown in Figure 2.3 below.

High

System's Efficacy	**Challenge** The system poses a challenge for the user and may be accepted only for compelling reasons	**Win** A high level of acceptance and success of the system can be anticipated
	Loss The effort put into the system is questionable as a low acceptance is highly likely	**Question** The system may be accepted by the user, but its advantage for all parties involved is questionable

Low   High

User Friendliness

Figure 2.3: Proposed technology acceptance matrix

As Figure 2.3 indicates, when both the system's efficacy and its user friendliness are low, an individual is unlikely to adopt the system in the longer term. Similarly, when a system is low on efficacy but appears user friendly, one may initially experience a high adoption rate amongst users, but the qualitative outcome is questionable, also this use may be short lived. Thus, a system that is high in efficacy and also high in user friendliness seems ideal. However, if it lacks user friendliness, this poses challenges to the user.

Cheung and Huang (2005) investigated the impact that technology has on learning and found that it has the potential to enhance learning activities for students. Moreover, it should be noted that in educational settings technology tends to be used as part of an assessment regime. Therefore, irrespective of whether students accept the technology, if they wish to fulfil their academic requirements, they often have no choice about using the technology. Therefore, in an academic setting, it is important to distinguish between the use of technology for learning purposes (which are then linked to assessments) or support purposes (where systems are used to help students to excel in an academic environment, but where the engagement with the technology is unrelated to academic performance). It can be readily argued that adoption will be quick and comprehensive in the former, and less so in the latter, unless the support systems are clearly seen by the students to be of significant value. The close involvement of the technology in the assessment regime eliminates voluntarism in adoption and choice. This situation is thus likely to foster a utilitarian approach to the adoption of technology. In a voluntary environment, user acceptance has been seen as pivotal in determining the success or failure of any information system (Davis 1993), but this does not necessarily hold true in a mandatory environment. The issue of mandatory use has been discussed by Rawstorne, Jayasuriya and Caputi (2000) and they argue that the theory of reasoned action (TRA), that underlies the TAM, is less applicable to situations where there is low volitional control for the end-user (Ajzen 1991). In their view, a mandated use may influence intentions to use a particular technology and in turn may influence their behaviour, but according to the definition, the acceptance of the technology is not greatly influenced. Moreover, their longitudinal study supported the application of the TAM in a mandatory environment for measuring user acceptance of a technology.

Interestingly, the TAM has not been used extensively in educational settings, and where it has been used, the focus has been on course satisfaction (Drennan et al. 2005) or to quantify the extent to which the technology had been used (Pituch and Lee 2006). Although the model appears to have value for investigating the relationships between technological use and learning, there appears to be little research into academic performance as a quantifiable reflection of acceptance outcome. Also, in their recent work, Drennan et al. (2005) acknowledge that the link between satisfaction and performance has not been fully established and suggest the need for further research in this area. It seems researchers have assumed that a higher uptake of the technology equals better performance and in turn, recommend actions to increase the uptake, but there appears to have been little critical evaluation of the effect technology uptake has on academic performance. These concerns indicate the need for further research to increase the educator's understanding of the relationship between technology acceptance and academic performance.

2.4.3   Section Summary

In this section the Technology Acceptance Model (Davis 1989), which explains processes involved in an individual's acceptance of technology, has been introduced. The model integrates *Ease of Use* and *Perceived Usefulness* as predictors for *Behavioural Intentions* to use a particular system. The value of this model is that it provides a framework that goes beyond a simple expression of liking and allows for statistical analysis. Further, the role of *Perceived Usefulness* was discussed, describing previous research in educational settings which showed that *Perceived Usefulness* may have a stronger influence on the technology acceptance than *Ease of Use* alone. As a result of this, an acceptance matrix was proposed that related system efficacy to user friendliness. It was also acknowledged that the acceptance of any teaching technology has to be seen within the framework of the academic subject and its requirements and that often acceptance is not a matter of choice.

2.5   Emerging Issues and their Relevance for the Current Study

The current study sought to establish whether there was any relationship between students' personality characteristics and their acceptance of teaching technology in the context of hospitality higher education. The following is a summary of the key issues that have emerged from the review of the existing literature:

Research with hospitality students has established the dominance of certain personality characteristics (Brymer and Pavesic 1990). Moreover, because personality can be understood as a set of cognitive preferences, it has been suggested by some researchers (Lashley and Barron 2005) that the way hospitality students learn and behave in an educational environment may be similarly distinct. More general research (Biggs 1999) suggests that the relevance of personality may depend upon issues such as context and students' prior learning experiences. Whilst there is some evidence from the wider application of personality research in educational contexts to support the view that differences in learning can at times be attributed to differences in personality (Dewar and Whittington 2000) this has not been found by all researchers (Hsu and Wolfe 2003). Thus any research which clarifies the nature of the relationship between personality of students and their learning behaviour may assist educators to provide their students with a more effective education.

There is evidence that students have different rates, and end levels, of acceptance of information and communications technology (ICT), but in hospitality education this process is not well understood. Furthermore, whilst individual characteristics appear to influence technology acceptance, there has been little focus on whether personality factors are relevant, particularly as most students are now familiar with many different types of technology.

Three distinct approaches to understanding Jung's personality constructs exist. These are:

1) Identification of an individual's personality type from 16 possible combinations of personality dimensions is the most popular and well understood approach. Information on each of the 16 types is plentiful and therefore this taxonomy of types appeals to most researchers whose intention it is to understand individual behaviour.

2) Application of a simplified framework that involves the use of four temperaments. This approach allows for a broader grouping and identification of strong behavioural differences within the group.

3) Identification of the Jungian functions. This provides the researcher with a more detailed picture as distinct cognitive preferences are analysed rather than combinations of these.

The decision was made to include all three interpretations in this study based on the fact that firstly, the existing literature on technology acceptance has not yet demonstrated the relevance of personality as an influencing factor, nor is any one approach clearly better than another in terms of its ability to answer the research question in the current study. Secondly, since a key aim of this study was to identify the personality traits of hospitality students that may affect the acceptance of teaching technology, it was assumed that a focus on only one possible interpretation of personality meant that, as with previous research it was not possible to compare the relative value of the different interpretations or decide upon the useful of Jung's constructs in specific contexts and with specific students. In contrast the inclusion of all three possible approaches to hospitality, while derived from the same instrument, may provide a better chance of identifying the relevance of personality dimensions in this research. Finally, the Technology Acceptance Model (TAM) was selected as it has been widely used to understand users' attitude towards a software or computer system. However, it should be acknowledged that its applicability to a mandated learning environment remains unanswered, particularly in terms of the explanatory power of the model's individual components.

Thus, having identified the key issues of the research, the general aims and hypotheses for the study will be presented in the next section.

2.6   Hypotheses

A hypothesis is "[…] a proposition about […] the relationship of two or more variables […]" (Wiersma and Jurs 2005, p. 40) and presents the research questions in a way that allows for analysis and testing. Figure 2.4 below represents the personality constructs, as extensions to the Technology Acceptance Model, and shows the proposed relationships that are expressed by the hypotheses for this study.
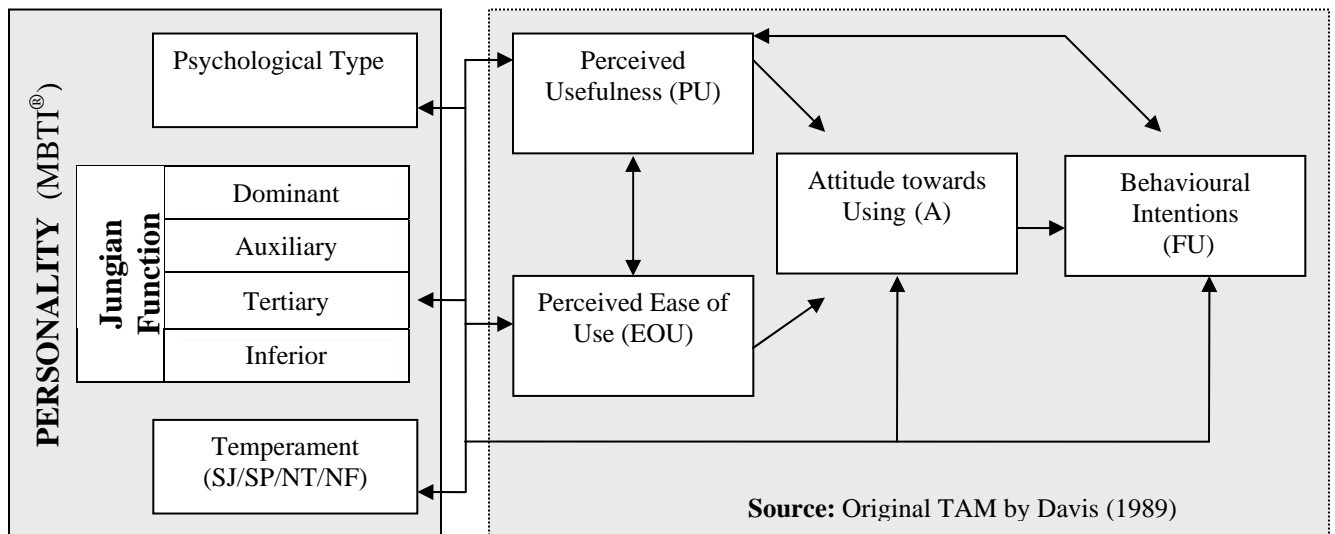
Figure 2.4: Proposed model for relationship between external variables and TAM

Three hypotheses emerged from the literature and the research question. The key focus of this research was to see whether or not a relationship can be established between the personality traits of hospitality students and their acceptance of WebCT as a teaching technology. It was expected that the research would support the notion that a teaching and learning technology which matches the individual's personality, would yield a higher acceptance of, and behavioural intention to adopt, the system. However, different interpretations of personality were identified in the literature review (psychological type,

Jungian functions and temperament) and it was therefore deemed appropriate to apply each approach individually. Thus, three over arching hypotheses were established for testing the research question:

Hypothesis 1: That there will be no relationship between psychological types as measured by the MBTI® and the acceptance of WebCT, based on the Technology Acceptance Model. More specifically;

H1.A: Psychological Type and Perceived Usefulness

H1.B: Psychological Type and Perceived Ease of Use

H1.C: Psychological Type and Attitude towards Using

H1.D: Psychological Type and Behavioural Intentions

Hypothesis 2: That there will be no relationship between the four Jungian functions as measured by the MBTI® and the acceptance of WebCT, based on the Technology Acceptance Model. More specifically;

H2.A: Four Jungian Functions and Perceived Usefulness

H2.B: Four Jungian Functions and Perceived Ease of Use

H2.C: Four Jungian Functions and Attitude towards Using

H2.D: Four Jungian Functions and Behavioural Intentions

Hypothesis 3: That there will be no relationship between the four Temperaments as measured by the MBTI® and the acceptance of WebCT, based on the Technology Acceptance Model. More specifically;

H3.A: Four Temperaments and Perceived Usefulness

H3.B: Four Temperaments and Perceived Ease of Use

H3.C: Four Temperaments and Attitude towards Using

H3.D: Four Temperaments and Behavioural Intentions

2.7　Chapter Summary

This chapter further explored the theoretical foundations of this study and discussed some of the previous research in these areas.

The first section of this chapter discussed the nature of hospitality education and its pedagogical evolution. It considered Hospitality's vocational roots which remain evident in most higher education programs, although the complexity of the industry and economic constraints for teaching institutions have influenced hospitality education in recent years. Today, the industry demands a range of graduate skills and abilities, which, in turn, inform modern teaching content and approaches. One of the more recent trends is the inclusion of teaching and learning technology in the classroom. Pressures to operate more economically have been identified as one driver for this trend; another one has been the increased reliance of the industry on Information and Communication Technology (ICT). Whilst the scope of literature dealing with the evolution and future direction of hospitality was found to be extensive, little research was evident that focussed on the individual student with relation to behavioural differences caused by personality.

Thus, the second section of this chapter dealt with the concept of personality. It explored Jung's theory of psychological type as it forms the basis of one of the most frequently used personality instruments: the Myers-Briggs Type Indicator (MBTI®). It became evident from the literature reviewed in this section that there is considerable ambiguity about the relationship between personalities (as interplay of cognitive processes) and learning preferences. Whilst it has been clearly established that certain personality types are over represented amongst hospitality students it has not been clearly demonstrated how this impacts on particular aspects of factors such as classroom behaviour and task approaches. Moreover there is a clear gap in the literature in terms of understanding the relationship between personality and the acceptance of teaching technology particularly at the moment when students are increasingly familiar with different computer applications. The third section of this chapter elaborated on the Technology Acceptance

Model (Davis 1989), a construct that explains processes involved in an individual's attitude towards, and acceptance of technology.

The chapter concluded with a reinforcement of the key issues of hospitality education, student personality and technology acceptance, relating the extant literature to the current study. As a result, three hypotheses for the current study were presented, each related to one distinct approach to personality. All of them, however, attempt to provide an answer to the question of whether a relationship exists between personality and acceptance of a teaching technology amongst the cohort in question.

Chapter 3   Methodology

This chapter presents the methodological approaches used in this study to explore the influence of students' personality type on their acceptance of teaching technology. The empirical nature of the research and its focus on a particular student cohort required careful consideration of the appropriateness of different sampling procedures, data collection and quantitative data analysis. The following sections provide an explanation and justification of the research design chosen, the sampling methods, the instruments for data collection and finally the analytical procedures for the testing of the hypotheses.

3.1   Research Design

As Zikmund (1991) has suggested, the research design must be determined by the purpose of the research. The purpose of this study was to investigate the relationship between personality and the acceptance of technology by hospitality students. A quantitative methodology seemed most appropriate for this research given the quantitative nature of both, the MBTI® instrument and previous research in the field of technology acceptance. The research design was divided into two discrete but interrelated stages. The first stage of the research focussed on validating previous research into the dominance of certain personality types amongst hospitality students and to identify students' general attitude towards teaching technology. The MBTI®, as a measure of personality, and a WebCT Acceptance Survey, as a measure of technology acceptance, were administered. Both instruments are described in more detail in section 3.3 and copies of these instruments are provided in Appendix A. The second stage focussed on establishing relationships between the variables measured in the first stage and, as such aimed at answering the research question.

3.2   Selection of the Sample

The participants for this study were selected using non-probability, convenience sampling. This sampling approach is congruent with previous quantitative studies using the MBTI® in an educational environment, which have been almost exclusively

conducted with small sample sizes (n=100 - 150) drawn from units, or disciplines or schools (Cooper and Miller 1991; Booth and Winzar 1993; Barr 1997) with which the researcher was professionally involved. This sampling technique was deemed appropriate given that the rationale of the study focused on examining the link between personality type and technology acceptance to enhance understanding of the student cohort. The sample derived from hospitality students at Victoria University.

The data were gathered over two semesters in order to increase the sample size. The academic units from which the sample was drawn were first-year units of study which are compulsory for all hospitality students, and were taught by the researcher. This allowed access to the largest number of students enrolled in hospitality degrees at Victoria University. Secondly, all respondents were exposed to a similar degree of teaching technology implementation. Although WebCT is deployed across all hospitality units of study, the extent, depth and breadth of WebCT deployment varies. In this instance, both units of study used WebCT for the dissemination of core lecture material as well as for providing additional, supplementary resources. Further, in both subjects online multiple choice testing was used to assess student learning. Given that the scope of technology deployment was different in other subjects within the discipline, which may have a profound impact on the acceptance of the technology by the students, it was deemed appropriate to sample respondents only from these two units of study. Finally, the involvement of the researcher in teaching the units provided some practical grounds for the decision to apply a convenience sampling method. Given the apparent weakness of this sampling approach it was important to implement strategies that helped to minimise the most severe problems such as response bias lack of and representativeness of the sample.

Students were enrolled in either *Introduction to Hospitality*, which normally has enrolment numbers of approximately 80 students per semester, or *Human Relations*, a compulsory support subject for all business students which has enrolment numbers of approximately 200 students per semester. Respondents were included in this study if their degree had a hospitality component (that is, the word hospitality appeared in their

degree title) or, in the case of Introduction to Hospitality, when the subject was chosen as an elective which demonstrated the students' interest in the hospitality industry.

3.3   Selection of Instruments

The correct selection of instruments is essential for achieving the research outcome. In particular, the instruments need to be established in what they measure (validity) as well as how they measure (construct and reliability) in order to answer the research questions. Further, the nature of the instruments needs to support the research design. For this study, survey research seemed appropriate. Based on previous work in the field of personality measures and technology acceptance, two instruments were chosen:

1)   Myers-Briggs Type Indicator – to measure personality more generally, and psychological type, Jungian Function and temperament specifically. The Myers-Briggs Type Indicator instrument used for this study was the Form K Booklet as it was published by the Australian Psychologists Press. It is a *typical performance* instrument, measuring attitudinal preferences. It is a self-report questionnaire comprising 131 dichotomous items, including word pairs. A copy of the original instrument can be found in the appendix (Appendix B).

2)   WebCT Acceptance Questionnaire – to measure acceptance of teaching technology generally and more specifically to measure perceived usefulness, perceived ease of use, attitude towards using, and ultimately behavioural intentions. The WebCT Acceptance Questionnaire is based on the Technology Acceptance Model and in the absence of a standardised instrument was developed for the purpose of this study. This instrument was an adaptation of previously developed surveys, particularly Davis (1989) and Gefen and Straub (2000). The questionnaire measured the acceptance of WebCT on the three scales of Perceived Usefulness (PU), Perceived Ease of Use (PEU) and Behavioural Intention (FU). It consisted of 14 statements, each of which was ranked on a scale from 1 to 5, where 1 represents *strongly disagree* and 5 represents *strongly agree*. The design and development of the

questionnaire followed the recommendations by Zikmund (1991) in terms of question wording, layout and question order. A copy of this instrument can be found in the appendix (Appendix C).

Wiersma and Jurs (2005) class personality measures such as the MBTI® as non-projective tests in that they require responses to statements. Although this approach is common in many attitudinal and personality measures, the MBTI® has been criticised on a conceptual level (Zemke 1992) as well as on a methodological level (Pittenger 1993) especially with regard to its reliability and validity.

The reliability and validity of the MBTI® has been the focus of many studies, mainly as a response to and questioning of the popularity of the instrument (Carlson 1985; Tzeng, Ware and Chen 1989; Zemke 1992; Pittenger 1993; Harvey 1996). According to the Centre for Applications of Psychological Type (CAPT) the MBTI is administered to millions of respondents around the world each year. On this basis, it is often recognised that the MBTI® is the most popular personality instrument available. However, it seems that the popularity lies in its applicability across a number of contexts. Furthermore, its ease of interpretation, although on a basic level, makes it attractive to use. In the following section the nature of the criticism evident in the literature will be explored and a justification provided for why, despite the criticism, the instrument was appropriate for this study.

Reliability of an instrument is concerned with the consistency of its measures (Wiersma and Jurs 2005). In other words, an instrument is seen as being reliable if changes in a respondent's repeated measurements are attributable only to chance. It is important for an instrument to be reliable if, on its basis, conclusions are to be drawn for a wider population. For the MBTI® reliability is particularly important, as the consistency is one of the fundamental underpinnings of type according to the theories of Jung. The understanding that personality does not change over time logically requires high reliability scores of the instrument if this theory is to be validated. On the other hand, Pittenger (1993) and Zemke (1992) for example conducted studies into the reliability

which resulted in scores that prompted them to question the reliability of the MBTI®. Harvey (1996) conducted a meta analysis on the reliability of the MBTI® and concluded that the instrument shows, in fact, high reliability scores, particularly with adult respondents. In his view, a thorough understanding of the instrument and its underlying concepts and construct would in fact eliminate some of the criticism. The main criticism of the instrument's test-retest reliability is related to a proposed Barnum effect in which participants self-validate a personality measure that is vague enough to apply to a wide range of people. This criticism is addressed in this study by focussing particularly on the cognitive processes and type dynamics rather than the just the classic 16 types as they are commonly used.

Validity refers to the extent to which an instrument measures what it is supposed to measure (Wiersma and Jurs 2005). In relation to the question: "Is the MBTI® a convincing and accurate instrument to measure personality?", Pittenger (1993) suggested that a statistical analysis of the test does not support the theory behind the MBTI®, a claim that Harvey (1996) rejected. Instead, he claimed the validity of the MBTI® is strongly related to an understanding of the complex theoretical framework. It seems evident that the apparent simplicity of the instrument is the reason not only for its popularity but also for its criticism. At the same time it has to be recognised that the underlying theory is more extensive than is reflected by the commonly discussed 16 personality types. As was established in the literature review, using the 16 personality types may be too simplistic an application of the instrument and its real value may lie somewhere deeper.

Overall, it can be said that the instrument, despite some criticism about its reliability, seems to be appropriate for this particular study. The study does not claim to be generalisable or representative of a wider population. The advantages of the MBTI®, in providing an insight into behavioural preferences and cognitive processes, outweigh any criticism of its statistical robustness.

As for the WebCT Acceptance Questionnaire, the underlying model has repeatedly been tested for accuracy, reliability and validity (Davis 1989; Igbaria and Zinatelli 1997; Woeber and Gretzel 2000), the instrument itself has not. This is due to the fact that there is no published, standardised test for this model. Rather, measurements are created on the basis of the technology that is to be tested. The reliability of the instrument was therefore tested as part of the data analysis. The construct validity of the three subscales was determined using a statistical analysis called *factor analysis*. Factor analysis is a test used to discern the underlying dimensions of a measurement (Zikmund 1991) by correlating individual questions in the test. It was expected to find three factors equivalent to the three dimensions (*Perceived Ease of Use*, *Perceived Usefulness* and *Behavioural Intention*) of the model.

3.4   Procedure

In the research process, the data collection follows on from the review of literature and is strongly informed by relevant studies. A systematic and precise data collection is pivotal for the subsequent research stage of data analysis and is directly responsible for the accuracy of research findings.

The data were collected in two discrete, interrelated stages. During the first stage, the students were asked to complete the Myers Briggs Type Indicator (MBTI®) Form K booklet during the lecture in the first week of the semester. These data were then manually entered and transformed into individual reports that informed the students about their personality type as defined by Myers-Briggs. Additionally, a seminar was held as part of the course for discussion of the personality constructs and to provide the students with information regarding their personality and the relevance of this for their future studies.

In the second stage, students completed a WebCT Acceptance Questionnaire which reflects the elements of the Technology Acceptance Model (TAM). Both instruments

questionnaire was administered as a pencil and paper instrument during the final lecture of the same semester.

The data were collected over two semesters in 2006 at Victoria University in Melbourne, Australia. The sample was drawn from students enrolled in *BHO1110 Introduction to Hospitality* and *BHO3473 Human Relations*. The researcher's administration of the instruments in class was deemed appropriate for this study for the reason that one of the ethical tenets of the use of the MBTI® requires that the person administering the instrument is an accredited user and present at the time of administration.

In line with the research approval by the ethics committee at Victoria University, all students were informed about the purpose of the study and their consent was sought to use the data collected in this particular study. It was stressed, that participation in this study was entirely voluntary and that their performance and grades in the subject would not be affected.

In addition to the instruments, students were asked to provide personal details including gender, age, their course details and year of study.

3.5 Data Analysis

Data analysis is the second last step in the research process and provides the arguments for the research discussion and the drawing of conclusions. Further, it should provide the information relevant for answering the research questions. Owing to the quantitative nature of the study a high emphasis was placed on the selection of appropriate statistical analyses.

All data were manually entered by the researcher and analysed using SPSS version 14.0. The first part of the analysis involved data purification and included the identification and elimination of outliers. Outliers are values that lie outside (usually in the extreme) the normal range of data (Zikmund 1991) and which should be eliminated when the normal distribution is distorted (McBurney 1990). The data analysis then focussed on establishing the reliability of each of the instruments by calculating the reliability coefficients (Cronbach's Alpha score). This reliability analysis was deemed appropriate for both instruments as the MBTI uses dichotomous responses whereas the WebCT Acceptance Questionnaire uses Likert-type scales. A reliability coefficient of .70 is considered appropriate for attitude instruments (Wiersma and Jurs 2005). Further, a factor analysis was conducted to establish the validity of the technology acceptance questionnaire and the sample was tested for response bias and normal distribution.

The data analysis was shaped by the two-stage research design. The first stage used descriptive analysis to provide a better understanding of the sample. This was followed by a correlation analysis, which explored the relationship between students' personality and their acceptance of technology. As is clearly appropriate within a classroom context, both approaches are non-experimental and did not attempt to manipulate, interfere or control any variables. Instead, they measured variables as they exist naturally (Gravetter and Forzano 2003). The initial descriptive analysis stage was designed to describe a phenomenon, and did not attempt to identify underlying causes.

In the first stage, the researcher attempted to validate the findings of previous studies with respect to the distribution of psychological type among hospitality students. In this stage, the data were analysed using distribution measures to determine patterns in the data. Additionally, the data were used to validate the relationships in the TAM as they are evident in the literature. This validation of the TAM is considered pivotal for the subsequent correlation analysis.

The correlational stage of the research analysed the relationship between two key variables measured during the initial stage of the research. In regards to the main research question, the goal of the correlation strategy was to examine any relationships between elements of students' personality and their acceptance of teaching technology, and subsequently describe the nature of this relationship. It should be noted that it is beyond the scope of this study to establish causation in this relationship or to rule out the existence of any influential external variables. Hence, the goal of this research is to provide a first step in understanding the phenomenon and to suggest further experimental research to investigate underlying causality.

The statistical techniques applied in the second part of the data analysis were chosen to move the analysis beyond a simple description of the sample and to address the key research question. In this stage, the researcher attempted to test for a relationship between the personality and technology acceptance via the two instruments as per the key research question.

Firstly, the analysis was based on the use of techniques including Multivariate Analysis of Variance (MANOVA) and t-tests to identify possible differences amongst cohorts in the sample in terms of a variety of dependent variables (Zikmund 1991). The Multivariate Analysis of Variance (MANOVA) is used to determine significant differences between two or more groups when there is more than one dependent variable. In this case, the MANOVA tested the difference between groups (age, study year, psychological type and temperament) with regard to the dimensions of the TAM. A t-test is a statistical hypothesis test for determining significant differences in the mean scores

for two groups (Zikmund 1991). This test determined whether or not significant differences existed between defined groups in the sample (such as gender) and the TAM dimensions.

This process enabled the exploration of the relationship between psychological type and technology acceptance. In the first instance, the MANOVA identified the existence of a relationship across the various psychological types as a whole across the four elements of the TAM as a whole. Subsequent t-tests were then used to more deeply explore the existence of differences between specific psychological types and specific elements of the TAM. Such an approach, without claiming cause, helps to identify the source of the overarching relationships.

3.6   Chapter Summary

This chapter introduced the methodology for the current study which explored the hypothesised relationships between psychological type and technology acceptance. The research design was quantitative in nature and comprised two stages: The first, descriptive stage was designed to validate previous studies in both, psychological type for hospitality students and the TAM constructs. The second stage was designed to answer the key research questions by applying inferential analysis to both measures. The data for this study were gathered using non-probability sampling, choosing two first-year undergraduate units as the sample frame. The process of data analysis included reliability and validity testing of both instruments and descriptive statistics of the sample. Finally the hypotheses were tested using Multivariate Analysis of Variance (MANOVA) and t-tests.

The following chapter reports on the data analysis and provides results that form the basis of the final discussion chapter.

Chapter 4   Results

This chapter deals with the results of the data analysis.   It starts with an acknowledgement of the limitations to the study, which provide an analytical framework for the discussion of the results.   The remainder of this chapter follows the research design previously introduced.   Firstly, an initial discussion of the sample is provided before the instruments were individually tested for reliability and validity. This is followed by the descriptive analysis of the two fields the study endeavours to link: the student personality types on the one hand and the technology acceptance on the other. Finally, the results of the correlation analysis are presented and the extent to which these support the hypotheses is indicated.

4.1   Limitations of the Study

This study like other studies is conducted within a particular framework and as such it has to be recognised that a number of limitations exist.   It should be noted, however, that the limitations of a study do not necessarily decrease its value or minimise its strength, rather they provide boundaries within which the results can be interpreted.

For this study, the following limitations need to be acknowledged:

Generalisability: The sample was drawn from business students undertaking first and second year hospitality subjects in which WebCT is deployed to a similar level. The results therefore do reflect this cohort, but do not necessarily allow for wider generalisation beyond the hospitality student population of Victoria University.   This study is of an exploratory nature and as such no claim is made that the findings are universally applicable.

Sample Characteristics: The socioeconomic background (SEB) of the students was not included in the analysis.   Although the SEB can influence the familiarity with common technological applications through limited access to hardware and networks, it can be argued that the students who participated in this study enjoyed equal opportunities

of computer access through the facilities on campus. Therefore the influence of socioeconomic background was limited and therefore ignored in this study.

Choice of teaching technology: The Technology Acceptance Model (TAM) was applied to WebCT which was the teaching technology implemented in the subjects under study, and findings may not be generally applicable to other software. Again, this study was of an exploratory nature and others may wish to validate the findings on other technologies in the future.

Choice of instruments: The instruments used in this study are subject to the same criticism made of most self-assessment instruments, that is, such instruments are subjective in nature and may or may not truly reflect the respondent's characteristics. A thorough introduction and explanation of the purpose of the study at the beginning of the data collection attempted to minimise this risk of response error.

Level of familiarity: It was assumed that the cohort were equally educated in the use of technology. This may not reflect the reality and it is possible that differing levels of familiarity with the technology may yield differences in attitudes and academic performance, regardless of personality. The data were collected in two subjects that were pioneering the use of WebCT within the School of Hospitality, Tourism and Marketing. In addition, one of the subjects was a first year first semester subject so it can therefore be argued that the respondents had no or limited exposure to WebCT beforehand.

External variables: Every correlation study faces the risk of the effect of extraneous variables which may influence the results and therefore falsify their interpretation. As such, motivation and self-efficacy were introduced as possible components in the technology acceptance framework, but are not distinctly tested in this study. They may, however influence the adoption of a teaching technology as a means for academic achievement even though they may be contrary to personal preferences or attitudes. The identification and characterisation of these and other potential external variables could form the basis for future studies.

As well as acknowledging these limitations arising from the framework of the study, they were also considered in the discussion of the results.

4.2   Sample

The data collection initially yielded completed and useable questionnaires from 239 respondents. Of this initial dataset, 73% (n=174) were female and 27% (n=65) were male. This reflects the gender distribution in hospitality courses at Victoria University and is similar to the distribution found in other studies in the area (Whitelaw and Gillet 2004). Given the total number of enrolments in the units of study in which the data was collected (n=285), this represents 84% and as such the sample was seen to be representative of hospitality students at Victoria University.

Initially, the respondents were from all stages of their studies. The majority, 80% (n=190) were in their first year of their studies while the remaining 20% (n=49) were in the second year of their degree. The majority, 73% (n=155) of the sample were studying a degree with a hospitality component. The remaining 26% (n=57) came from other disciplines (mainly accounting) but were included in the sample because they had chosen the hospitality unit as an elective.

An analysis of the age distribution (One-way ANOVA to compare means) confirmed expected differences between the age groups in their responses to the WebCT Questionnaire, particularly with regard to the Ease of Use. Respondents over 25 years of age were identified as outliers and as such eliminated from further analysis, resulting in a final dataset comprising 212 respondents (m=56; f=156). A cross tabulation was done and the Pearson Chi-square test conducted. No significant differences across the age groups were found in terms of the MBTI[®], temperament and dynamic functions.

4.3 Instrument Completion

Of the sample of 212 respondents, 86 students (41%) completed the WebCT Acceptance Questionnaire and 193 students (91%) completed the MBTI®. Out of the final sample, 61 students (32%) completed both instruments. The different completion numbers raise the question about how far missing responses can be credited to non-response bias or are unrelated factors that would not necessarily influence the way a respondent would complete an instrument. Such a factor could simply be due to non-attendance at the time of administration. If non-response bias can be ruled out, the sample can be treated as a homogeneous one and thus no cases have to be eliminated for the analysis. In order to do this, the sample groups were analysed (one-way ANOVA) for differences in their responses on the MBTI® and TAM score separately. In addition, cross tabulations were used to examine differences in their MBTI® responses. The Pearson Chi-square indicated no significant differences in the samples between those who completed one and those who completed both instruments, thus suggesting that 'no response' was a consequence of sampling. Based on these findings, it would appear valid to treat the sample as one, irrespective of instrument completion.

4.4 Instrument Reliability and Validity

The Reliability Statistics on the 14 items of the WebCT questionnaire (Technology Acceptance Model) returned a Cronbach's Alpha score of 0.782, which may partly be credited to the relatively small sample size. This score shows an acceptable reliability of the instrument and supports earlier studies into the reliability of the instruments that are based on the TAM construct (Szajna 1994).

An internal reliability test of the 131 items of the MBTI® returned a Cronbach's alpha score of 0.460. This score suggest a lower internal reliability and is similar to Zemke's (1992) and Pittenger's (1993) reliability results. Although the achieved score in this study supports the critique of the statistical significance and robustness of the MBTI® instrument, the internal reliability alpha score may not be the correct measure for instruments such as the MBTI® and a test-retest correlation testing temporal stability

would suit the construct better (Harvey 1996). The scope of this study did not allow for a test-retest validation of the instrument and such an analysis was not relevant to the research questions. Therefore, the lower internal reliability score is acknowledged and seen as a trade-off for the applicability of the instrument. However, other studies have recognised the instrument as being statistically reliable, with repeated reliability scores around 90% (MacDaid 1987; Barger et al. 1996; Harvey 1996; Walck 1997; Whitelaw 2002). Nevertheless, the internal reliability found for the MBTI® in this study, although statistically questionable, seems suitable for this study as the sample size does not allow for a substantial reliability analysis. Similarly, the MBTI has been tested for validity in a number of settings, generally with favourable results (Carlson 1985; Johnson and Saunders 1990) and as such a separate validation study for the current setting was not deemed to be required.

A factor analysis of the WebCT Acceptance Questionnaire confirmed that three factors explained 66% of the total variance in the model, suggesting that the responses to individual items of the questionnaire are sufficiently represented by the three factors. The individual component correlation matrix shows that the item correlation to each of the three factors is congruent with the three dimensions of the model (*Perceived Usefulness, Perceived Ease of Use and Future Usage*). This confirms construct validity of the researcher-designed questionnaire and the item groupings.

4.5   Student Personality

The first stage of the data analysis was concerned with the MBTI® type distribution across the current sample.   Figure 4.1 below shows the distribution of the four dimensions in the sample.   The mean as well as the modal group type is ESTJ, the combination of extraverted energy orientation, a sensing preference for information intake, a preference for rational decision making and an organised approach to life.

Figure 4.1: MBTI dimension distribution of the sample
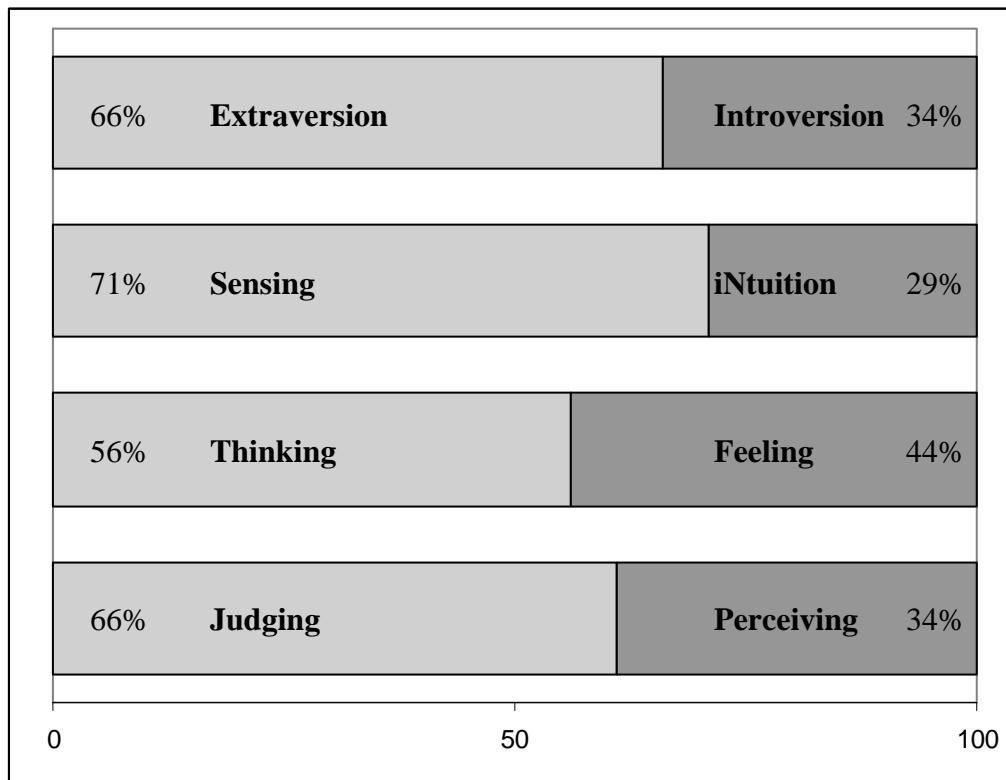
Previous studies have suggested that the type distribution for hospitality students differs from those in other disciplines and, in fact, in the overall population. In order to support or decline these findings, results for the sample of this study were compared to the estimates for the overall Australian population and to the samples of previous studies, when available.

To date, no comparative data of the MBTI® distribution amongst Australian higher education students are available. The most comprehensive dataset has been assembled in the MBTI® Australian Data Archive at the Psychological Type Research Unit at Deakin University, Victoria, Australia. This dataset which comprises over 14.000 MBTI® results provides for limited comparison as it is heavily skewed towards professionals (but also includes University students). Nevertheless, it does give indicative figures for comparison. One previous study conducted by Gillet et al. (2005) used a similar population as the current study, suggesting that the type distribution ought to be very similar. The third study providing comparative data originates from the United States. In this study Horton et al. (2005) studied a sample of undergraduate hospitality management students, although the different cultural setting limits its relevance for comparison. Here it is worth noting that the US population data that were used by Horton et al. are not replicated in Australia (Ball and Geyer 1999), suggesting that the type distribution substantially differs between the two countries. Therefore, the figures derived from the studies conducted with hospitality students in the US may be of limited comparative value.

Ball and Geyer (1999) also caution the use of accumulated data to draw conclusions about the wider population, as the data can not clearly be deemed representative of the population. Anecdotal evidence suggests for example that the Australian population is slightly more extraverted than introverted. However, the numbers in the database do not reflect this tendency with the modal type being ISTJ. This may partly be due to the personal willingness of certain types to complete the MBTI®. These factors should be considered when the study sample is compared to wider populations. The closest available type distribution data of University students is again derived from the Psychological Type Research Unit at Deakin University in Australia and is based on a sample of 556 students across a range of disciplines.

In Table 4.1 on page 81, the distribution of the sixteen types is compared across the Australian population data, the Australian University sample, the current study and three previous studies into personality types of hospitality higher education students.

This comparison shows some interesting commonalities and also differences. Firstly, the current study confirmed the existence of a large proportion of ESTJ and ISTJ types amongst hospitality students at Victoria University, which is similar to the findings of Gillet et al.(2005). However, the same study also found a large proportion of ENFP and ESTP types (2005), something that was not replicated in this study. Similarly, the large representation of ENFP in the Australian University sample was not reflected in this study. The large proportion of ESTJ types across all samples may be explained by the generally high representation of this type in the overall population (Australia and US). The current sample however shows a significantly higher proportion of this type compared to the wider population.

Table 4.1: Type distribution comparison with other studies

Type	Population Australia*		University Sample**		Current Sample		Gillet et al.***		Martin ****		Horton et al.*****	
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank
ISTJ	17	1	5	6	12	2	14	1	7	5	6	5
ESTJ	13	2	11	2	24	1	12	2	17	1	14	2
ISFJ	8	3	5	6	5	5	5	5	4	7	5	6
ENTJ	7	4	4	7	3	7	7	3	4	7	2	9
INTJ	7	4	1	10	2	8	3	6	2	9	2	9
ENTP	6	5	3	8	5	5	5	5	11	3	10	3
ENFP	6	5	24	1	8	4	12	2	10	4	16	1
ESFJ	5	6	11	2	9	3	6	4	10	4	10	3
INTP	5	6	1	10	3	7	2	7	3	8	3	8
INFP	5	6	6	5	4	6	3	6	3	8	1	10
ESTP	4	7	4	7	5	5	14	1	12	2	6	5
ISTP	4	7	1	10	4	6	3	6	6	6	4	7
INFJ	4	7	5	6	2	8	2	7	0	11	3	8
ENFJ	3	8	10	3	4	6	6	4	1	10	8	4
ISFP	3	8	2	9	3	7	2	7	3	8	2	9
ESFP	2	9	7	4	9	3	7	3	6	6	8	4

* and ** Type Distribution of Population in Australia, used with permission from Ian Ball, Psychological Type Research Unit, Deakin University, Australia
*** Gillet et al. (2005); Made up of 200 UG Hospitality Students at Victoria University, Australia
**** Martin (1991); Made up of 229 UG hospiyality majors students at University of North Texas, US
***** Horton et al (2005); Made up of 884 UG hospitality major students James Madison University, US

As previously discussed, the MBTI® typologies are not the only possible approach for understanding personality. In terms of temperament, half of the current sample (51%, n=98) showed an SJ – Guardian temperament, followed by the SP - Artisan (20%, n=39), the NF - Idealist (17%, n=33) and finally the NT - Rationalist temperament (12%, n=23). This dominance of the SJ temperament and the impact this has on the learning environment is discussed further in Chapter 5.

According to Jung's theory, the dynamic functions can provide a more accurate description of personality as they also determine type development (Jung 1971). The dynamic function distribution of the current sample is shown in the figures 4.2 to 4.6 below. Each figure represents one of the four dynamic functions.
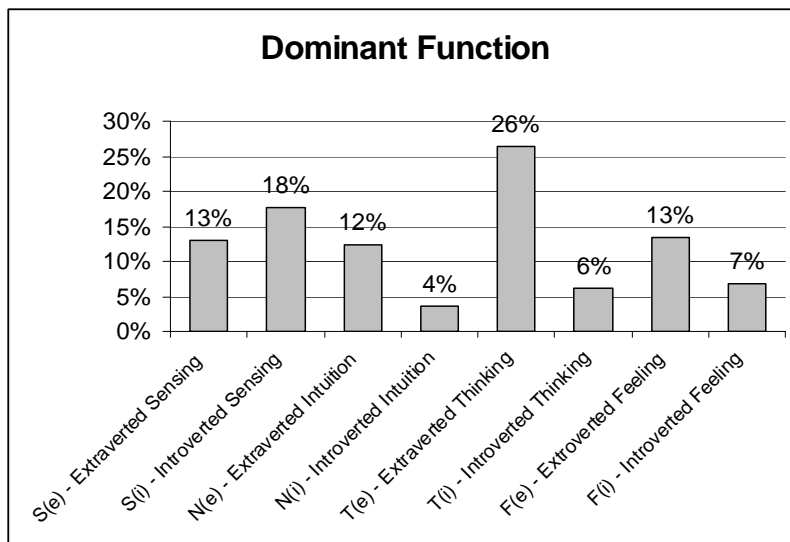
Dominant Function

Figure 4.2a Dominant function distribution of the sample

Figure 4.2a shows a dominance of the 'Extraverted thinking - T(e)' function with a quarter of the current sample expressing this preference. This is followed by a preference for 'Introverted Sensing – S(i)' by 18% of the current sample. It is also noteworthy that only 4% of the personalities in the current sample are dominated by an 'Introverted Intuition N(i)' function.

The inferior function mirrors the dominant function, as it is evident in Figure 4.2b, and is a result of the bi-polar organisation of the functions.
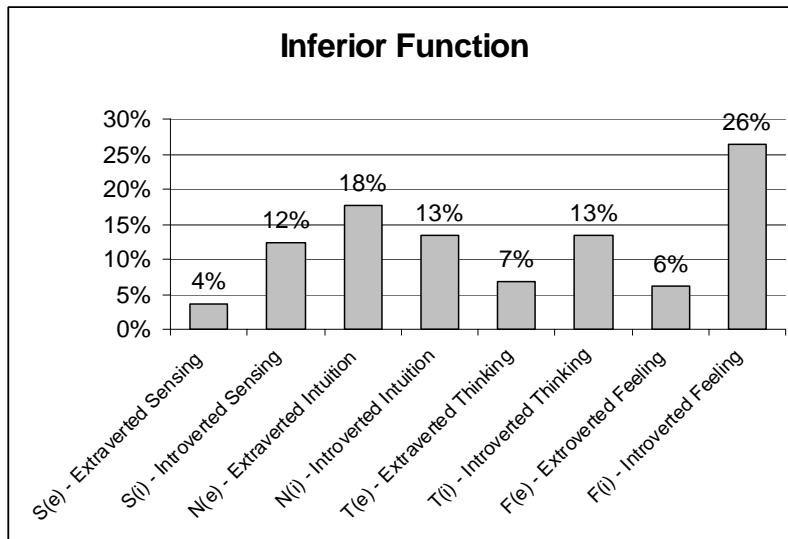
Figure 4.2b Inferior function distribution of the sample

The auxiliary function is the second most dominant function in an individual's personality and expresses their preference for dealing with the external world, as opposed to the dominant function, which focuses on the individual himself. As evident in Figure 4.2c, a third of the current sample prefer to use their 'Introverted Sensing – S(i)' function when dealing with the outside world.
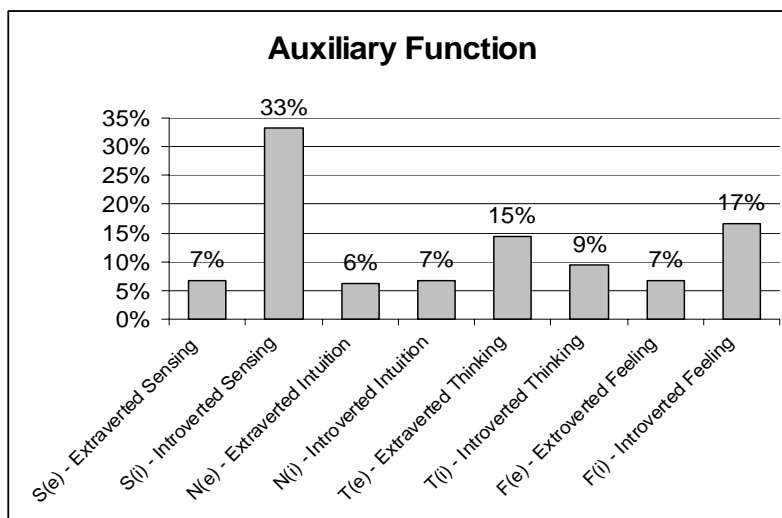
Figure 4.2c Auxiliary function distribution of the sample

Finally, again as a result of the bi-polar organisation of the functions, the tertiary function (as presented in Figure 4.2d on the next page) mirrors the auxiliary function. This shows a dominance (33%) of the 'Extraverted Intuition – N(e)' function. As discussed, the tertiary function is of limited interest for the current study as it is said to develop (and therefore become evident in behaviour) at about 30 years of age.
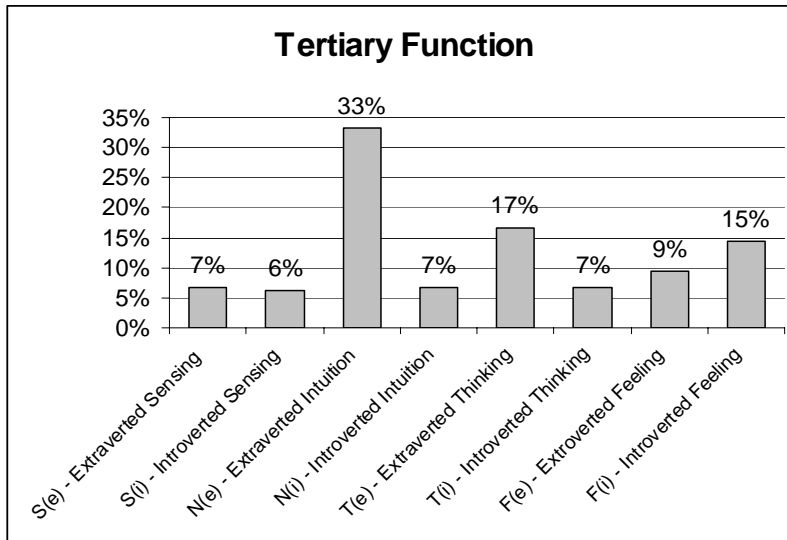
Tertiary Function

Figure 4.2d Tertiary function distribution of the sample

In summary, it can be seen that the 'Extraverted Thinking - T(e)' (dominant) and 'Introverted Feeling – F(i)' (inferior) combination is highly represented in the sample. This is not surprising as this is the dynamic combination of the modal type in the sample, ESTJ.

4.6   The Technology Acceptance Model

In order to investigate the usefulness of the Technology Acceptance Model for understanding student acceptance of WebCT in a mandated environment, a validation of the original model was sought. For this purpose, a bivariate correlation was conducted to obtain correlation coefficients of the variables *Perceived Ease of Use* (PEU), *Perceived Usefulness* (PU) and *Behavioural Intention* (FU).   Pearson correlation coefficients showed that significant positive linear associations existed between *Perceived Ease of Use* and *Behavioural Intention* as well as *Attitude towards Using* and *Behavioural Intention*. The data did not support a linear association between *Perceived Usefulness* and *Perceived Ease of Use*; neither did they support a direct relationship between Perceived Usefulness and Behavioural Intention. Figure 4.3 below shows the original TAM including the significant Pearson correlations from the current study, where applicable.
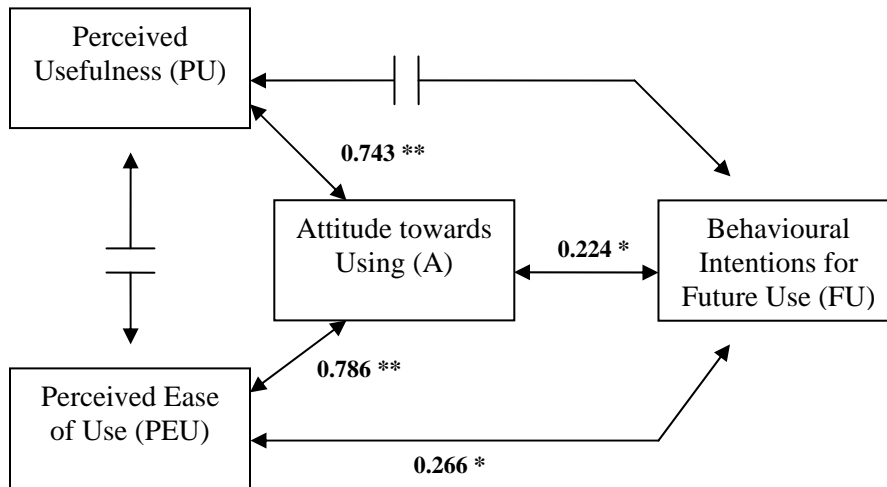
* significant at the 0.05 level

** significant at the 0.01 level

Figure 4.3: Bivariate correlations of the TAM variables

A correlation was accepted as significant if it achieved the 0.05 level. Since Attitude towards Using is a computed variable from PU and PEU the relationship is induced and as such does not require further interpretation. Although the direction of the relationship

was not determined by this analysis, it seems reasonable to assume that Future Usage is influenced by variables that are measured at present (*Perceived Ease of Use* and *Attitude towards Using*) as any other cause and effect relationship would require a redefinition of Future Usage.

4.7 Correlational Analysis

The second stage of the data analysis took the analysis beyond the descriptive level and attempted to identify correlations between the dimensions measured. In order to do so it was first necessary for the demographic variables measured to be ruled out as external variables in order to eliminate the risk of misinterpreting correlation causes.

4.7.1 Demographics

In a first stage of the analysis, the demographic details of the respondents (age, gender and study year) were tested for correlation with both instruments. This was done with an aim to eliminate demographic influence on the constructs in question. Chi-Square tests were performed to calculate significance scores. Scores with a significance level of 0.05 would indicate that the respondents across the sample significantly differed for that respective variable. Table 4.2 below shows the Pearson Chi-Square results of this set of tests:

Table 4.2: Chi-Square results of demographics cross-tabulation

	MBTI® Personality Type	*Jungian Functions*	*Temperament*
Age	0.739	0.295	0.271
Gender	0.191	0.359	**0.045***
Study Year	0.567	0.742	0.982

* significant at the 0.05 level

From these results, there seems to be a gender difference in the temperaments of the respondents. This is most likely to be related to significant differences on the Thinking-

Feeling scales for these two groups (where male respondents are skewed towards Thinking and female respondents are strongly skewed towards Feeling), a phenomenon that is widely recognised in the literature (Borg and Stranahan 2002). On the basis of this significant difference on the temperament scale, the sample was then separated by gender for the temperament-correlation analysis.

Next, this gender difference was tested for the responses to the WebCT Acceptance questionnaire. Table 4.3 below shows the results of this analysis.

Table 4.3: t-tests results, Gender * WebCT Acceptance

	Male	**Female**	**t**	**df**	**Sig**
Perceived Usefulness (PU)	3.56	3.37	1.057	84	0.293
Perceived Ease of Use (PEU)	3.93	4.04	-0.588	84	0.558
Behavioural Intention (FU)	3.28	3.13	1.053	84	0.296

The comparison of the gender groups did not show any significant differences in the responses to the Technology Acceptance Questionnaire. Albeit the mean scores are not significantly different, it seems noteworthy that males scored higher on most items, but females scored higher on the subscale of Perceived Ease of Use (PEU). This may indicate that significance levels might be achieved in a larger sample.

Given that the sample includes a range of age groups from 18 years of age to 24 years of age, it was deemed appropriate to analyse whether significant differences between the age groups exist in relation to the technology acceptance. Table 4.4 on page 88 shows the results of the MANOVA conducted.

Table 4.4: MANOVA; Age * WebCT Acceptance

F=1.126, df=21, Sig=0.321			
	Perceived Usefulness (PU)	**Perceived Ease of Use (PEU)**	**Behavioural Intention (FU)**
F	1.426	0.921	1.015
Sig	0.207	0.495	0.427
18	3.54	4.70	3.25
19	3.69	3.80	3.36
20	3.44	4.09	3.10
21	2.99	3.87	2.84
22	3.56	4.08	3.28
23	3.68	4.24	3.18
24	3.42	3.69	3.33

No significant difference between the age groups was found.   This confirms the appropriateness of the early exclusion of outliers. Given the age range represented in the sample and the assumption that a significant maturation process may occur between 18 and 25 years of age, this result means that all respondents can be treated similarly, regardless of age.

Another MANOVA was conducted to determine whether significant differences existed between groups of the sample on the basis of their year of study. This analysis was deemed appropriate as it was found that age is not necessarily an indicator for study progress. However, study progress is likely to be linked to previous exposure to teaching technology and greater skill development in general and might therefore influence the acceptance of WebCT amongst the current respondents. Table 4.5 below shows the results of the MANOVA.

Table 4.5: MANOVA; Study Year * WebCT Acceptance

F=3.11, df=3, Sig=0.031			
	Perceived Usefulness (PU)	**Perceived Ease of Use (PEU)**	**Behavioural Intention (FU)**
F	0.226	8.638	0.008
Sig	0.636	**0.004**	0.927
First Year	3.41	*3.88*	3.18
Second Year	3.50	*4.48*	3.16

There seemed to be a significant difference in the *Perceived Ease of Use* of WebCT when the first study year was compared to the second. It is unlikely that students were exposed to WebCT before the commencement of their studies at Victoria University, so the findings that first year students scored significantly lower (mean=3.88) than second year students (mean=4.48) would indicate that second year students may have had some exposure to the technology in other units or generally be more confident.

Thus, it seems noteworthy, that the significant differences in *Ease of Use* were attributable to the study progression and not to age per se. Therefore, previous exposure to WebCT may have had a stronger influence on these respondents than age. It cannot be discounted that this could be explained by other factors associated with successful progression- namely self-efficacy.

4.7.2   Model Analysis

The proposed model for this study suggested that the elements of the Technology Acceptance Model can be extended by including dimensions of personality, namely the personality type as identified by the MBTI®, the combination of dynamic functions and the temperament. All three dimensions derive from the same instrument and data, yet provide a different angle of viewing personality. The hypotheses were tested using a Multivariate Analysis of Variance (MANOVA), testing the significance in differences in mean scores of the TAM subscales. In the following sections results of testing of the model in the sequence of the proposed hypotheses are presented.

4.7.2.1   Psychological Type * Technology Acceptance

The first hypothesis proposed the non existence of correlations between the psychological types as measured by the MBTI® and the constructs of the Technology Acceptance Model as measured by the WebCT Acceptance Questionnaire. Table 4.6 on page 90 shows the mean scores of the WebCT Acceptance Questionnaire by psychological type (ranging from 1 to 5, where 1 expresses low acceptance and 5 expresses high acceptance).

Table 4.6: MANOVA; Psychological Type * WebCT Acceptance

F=1.159, df=45, Sig=0.253	Perceived Usefulness (PU)	Perceived Ease of Use (PEU)	Behavioural Intention (FU)
F	1.917	0.834	0.780
Sig	**0.043**	0.637	0.693
ESTJ	3.55	3.80	3.12
ESTP	3.33	3.80	3.78
ESFJ	3.57	3.94	3.24
ESFP	3.77	4.33	3.21
ENTJ	4.00	4.20	3.33
ENTP	1.75	2.70	2.83
ENFJ	2.00	3.80	4.00
ENFP	3.04	4.05	2.75
ISTJ	3.43	3.77	3.22
ISTP	3.17	4.40	3.00
ISFJ	3.92	4.15	2.83
ISFP	3.75	3.70	3.33
INTJ	3.58	4.90	3.50
INTP	4.17	3.70	3.33
INFJ	3.50	5.00	2.33
INFP	3.44	3.80	3.56

The results show that there were significant differences (sig= 0.043) between the groups (psychological type) on Perceived Usefulness. Comparing the mean scores for Perceived Usefulness across the sixteen psychological types using one-sample t-tests revealed that the ESFP type scored significantly higher (3.77, Std.D.=0.308) on *Perceived Usefulness* than the rest of the sample (sig.=0.017). No other significant deviations from the overall mean scores were detected across the sixteen psychological types.

Thus, each of the four parts of Hypotheses 1 can be accepted. Although some significant differences in mean scores between the sixteen types on the scales of the WebCT Acceptance questionnaire existed, no general relationship were established. Some possible explanations for this are discussed in Chapter 6.

4.7.2.2 Dynamic Functions * Technology Acceptance

The second hypothesis proposed the non existence of correlations between the Jungian functions as measured by the MBTI® and the acceptance of WebCT, based on the Technology Acceptance Model. This hypothesis was based on the argument that the dynamic combinations represent cognitive functions better than the use of the sixteen MBTI® types. Here, personality differences are understood in terms of their combination of any eight dynamic functions. As previously explained only the first four overt functions are included in this study, namely the dominant, auxiliary, tertiary and inferior function.

As evident from the significant scores shown in Table 4.7 below, a MANOVA returned no significant differences in the mean scores of the TAM subscales *Perceived Ease of Use*, *Perceived Usefulness* and *Future Usage* when comparing the dynamic functions.

Table 4.7: MANOVA; Dynamic Functions * WebCT Acceptance

	F	Df	Sig
Dominant	1.068	21	0.387
Auxiliary	0.990	21	0.478
Tertiary	0.990	21	0.478
Inferior Function	1.068	21	0.387

A set of one-sample t-tests were also conducted to detect significant differences in the mean scores of *Perceived Usefulness*, *Perceived Ease of Use* and *Future Usage* across the dynamic combinations. Interestingly, only one dynamic combination showed a significantly higher mean score on the scales of *Perceived Ease of Use*. The combination of introverted intuition (Ni) as dominant function and extraverted sensing (Se) as inferior function had a mean of 4.93 (Std D.= 0.115) which was significantly higher than the overall mean score of 4.01 (sig.=0.005). The small number of representatives of this combination in the sample (n=3) however, invalidate its statistical significance. Thus, overall, the four parts of the hypothesis 2 have can be accepted.

4.7.2.3 Temperament * Technology Acceptance

The third hypothesis proposed the non existence of correlations between the temperament as measured by the MBTI® and the acceptance of WebCT, based on the Technology Acceptance Model. This hypothesis argued that the popular categorisation of personality into temperaments could be suitable as an extension of the TAM. A comparison of the mean scores of the four temperaments (see Table 4.8 below) showed that students with an NF temperament scored lower on *Perceived Usefulness* and *Behavioural Intention*, suggesting that there may be a lower appreciation of the technology within this student group. In contrast, the SP temperament scored higher on all the scales of the TAM. Overall, although the mean scores differed amongst the temperaments, they were not shown to be significantly different and as such only suggest subtle differences which may achieve significance in a larger sample. From a statistical point of view, the lack of significant differences between the mean scores of the temperaments suggests that the temperament groups are similarly indifferent towards the adaptation of technology. It can only be assumed that attitudinal differences exist for the NF and SP temperaments and the effect that the technology has on their learning is less of an issue for NT and SJ students.

Table 4.8: MANOVA; Temperament*WebCT Acceptance

F=0.667, df=9, Sig=0.738						
	Perceived Usefulness		Perceived Ease of Use		Behavioural Intention	
F	1.02		0.448		0.312	
Sig	0.390		0.720		0.817	
	(1= strongly disagree; 5=strongly agree)					
	Mean	**Std deviation**	**Mean**	**Std deviation**	**Mean**	**Std deviation**
SJ - Guardian	3.55	.73	3.85	.95	3.15	.68
SP - Artisan	3.60	.50	4.15	.72	3.31	.51
NF - Idealist	3.11	.66	4.04	.54	3.11	.73
NT - Rationalist	3.44	1.04	3.91	.84	3.26	.57
Total	**3.43**	**.75**	**4.0**	**.81**	**3.18**	**.60**

Therefore, all four parts of hypothesis 3 have to be rejected, as the construct of temperament does not seem to explain the variation in the TAM variables.

4.8 Chapter Summary and Conclusion

In this chapter, the results of the data analysis involving the testing of the proposed hypotheses were reported. Firstly, it was established that the ESTJ and ISTJ personality types accounted for over a third of the sample with the numbers being proportionally higher compared to other Australian samples. Secondly, the large number of NP personality types that were found in previous studies was not replicated in this sample.

The Technology Acceptance Model was partly validated, showing significant correlations between Attitude towards Using and Behavioural Intention as well and Perceived Ease of Use and Behavioural Intention. The direct relationship between Perceived Usefulness and Behavioural Intention was not supported by the data, nor was the relationship between Perceived Usefulness and Perceived Ease of Use.

Overall, the analysis has revealed some differences in mean scores of the WebCT Acceptance scales across the personality measures. Thus, it was suggested that in spite of a lack of statistical significance, some attitudinal differences towards the technology existed for NF and SP temperaments, but less so for SJ or NT temperaments. Across the sixteen psychological types there were significant differences in the mean scores of Perceived Usefulness, while the inferior function may play a role in explaining variations in the TAM.

The data analysis has shown that the sample was often too small to produce robust and reliable statistical results. The outcomes of the statistical analysis were inconclusive and it is suggested that future studies facilitate a larger dataset. For this study all hypotheses were accepted and as such, personality could not be established as clear an extension to the Technology Acceptance Model. Some of the findings however are indicative for individual differences playing a part in the model, but the strength and nature of that relationship remains unclear. Nevertheless, the personality characteristics of the sample on the one hand and the findings of the WebCT questionnaire on the other, demonstrates the need for further reflection and discussion.

Chapter 5 Discussion

5.1 Introduction

In this chapter the previously presented results are discussed and related to previous research. In the first section, the role the Technology Acceptance Model (TAM) plays in this learning environment is elaborated on further. Secondly, the representation of personality types amongst the sample and the potential consequences this type distribution may have on the learning environment are discussed.

On the basis of the results of the data analysis it would appear that two major findings are worthy of further discussion. Firstly, there is the role that individual difference such as personality plays in the explanatory power of the Technology Acceptance Model (TAM), particularly if technology should be chosen as an educational medium in a mandated environment. Secondly, there is the distribution of cognitive function preferences across the sample of hospitality students and the impact they have on educational practices, with a particular emphasis on graduate employability.

5.2   Technology Acceptance Model

The validation of the Technology Acceptance Model and the examination of the explanatory power of personality within this framework was a key focus of this study. The results, as hypothesised, indicated that with this particular student cohort personality could not explain differences in the model and personality cannot therefore be used to extend the model.

The non-existence of the explanatory power of personality and the incomplete validation of the TAM are interesting and it is suggested understandable in terms of the model. In fact, it has been argued that the TAM's belief construct (*Perceived Usefulness* and *Perceived Ease of Use*) fully mediate the impact of individual differences (Burton-Jones and Hubona 2005) on user's attitudes and intentions to use a particular system. If such findings were to be repeatedly confirmed in future studies, the notion of external variables would need to be revised and simpler models constructed to exclude individual differences altogether (Agarwal and Prasad 1999)

When the results from the Technology Acceptance Model (TAM) are compared to those of other studies, it can be seen that the notion of direct explanatory power of *Perceived Usefulness* (PU) on *Behavioural Intention* (FU) is not repeated. Similarly, the results showed a direct and significant relationship between *Perceived Ease of Use* (PEU) and *Behavioural Intention* (FU). This last result is particularly interesting, as previous studies have established only an indirect relationship between PEU and FU, concluding that PU is stronger in its influence than PEU. This does not hold true in this sample.

The established relationship between Attitude towards Using (A) and Behavioural Intention (FU), finally supports the underlying notion of the model, namely that a positive attitude towards a technology is likely to result in an uptake or facilitation of it. While Davis (1993) suggested that the acceptance is a pivotal factor for success in a

voluntary environment, this study to some extent supports this view for a mandated environment as well.

The results from the current study suggest that the influence of a mandated environment may be a key factor in explaining some of the variations in the predictive power of the model. In an educational environment, it would be expected that attitudes towards any particular teaching technology are primarily related to expected outcomes, that is, the anticipated advantage or disadvantage associated with the technology. Experience has shown that students express particular discomfort with applications where the technology is used to test and assess their academic progress. In contrast, it seems much harder to design information systems that actively support students in their learning endeavours. As a result, student acceptance ratings of technology have to be interpreted with caution and always in the context in which they are used.

In a mandatory usage situation, "the absence of volitional control hinders a person's will not to perform the behaviour" (Rawstorne et al. 2000, p. 37), because non-performance (as in the non-usage of WebCT) has negative consequences. This holds true to some degree, as parts of the assessment regime in the unit under study were allocated to online tests conducted on WebCT. Although this could be interpreted as forcing the students to engage with the technology and, in turn, imposing negative consequences for non-use, this view may be superficial. In fact students can engage with the technology to a minimum degree and expect a satisfactory outcome; in contrast, rewards do not gradually increase with additional use. Therefore, a student who accesses the system excessively may not necessarily perform better. Rawstorne et al. (2000) also support the view that behavioural intentions are not necessarily good predictors of behaviour and that the actual behaviour may be influenced by other external factors in the environment. This study examined the attitude towards WebCT, but does not measure actual behaviour, thus it can only be presumed. Eventually, the course design, adaptation of the technology in individual units and WebCT elements available to students determines the behaviour. This is the reason why a measure of actual system use was not included in this study, but forms the basis for recommendations in the next chapter.

The results indicate that, in contrast to previous studies, *Perceived Ease of Use* (PEU) has a direct influence on *Behavioural Intention* (FU), whereas *Perceived Usefulness* (PU) only influences *Behavioural Intention* (FU) indirectly. This seems in contrast to other recent studies (Igbaria and Zinatelli 1997; Cheung and Huang 2005; Drennan et al. 2005; Pituch and Lee 2006) and partly verifies the original model (Davis 1989). It further raises the question of whether attitude can in fact be eliminated from the original model as proposed by Venkatesh (1999). On the basis of this study it appears that attitude should remain a key component of the model, as *Perceived Ease of Use* alone explains only a small part of the variation in *Behavioural Intention*.

The suggestion that the *Perceived Usefulness* of a system is not necessarily more important than *Ease of Use raises* some questions about the implementation phase and subsequent support mechanisms. The correlation that was found in the current study suggests that technology is generally appreciated (and seen by students as a worthwhile contribution to their individual studies) if its handling, use and set up is clear and accessible. Based on this it could be argued that well designed training and subsequent support can increase the behavioural intention to use the technology. The positive effect training has on perceived usefulness has also been documented by Pituch and others (Drennan et al. 2005; Pituch and Lee 2006) who stated that initial training and support diminishes dissatisfaction and creates familiarisation with the system, which, in turn, may lead to higher degrees of satisfaction. This study confirmed previous experience and anecdotal evidence from Victoria University that students generally perceive WebCT as being easy to use; with over 80% of respondents agreeing a proportion that is also consistent with results from other studies (Kaminski and Rezabek 2000; Landry et al. 2006) looking at the same technology.

In the units investigated in the current study, the training practices focussed predominantly on navigational skills and the use of basic communication and assessment task submission functions. Since assessments were conducted online, practice tests were set up at the beginning of the semester in order to familiarise students with the system.

Based on the literature, and the findings of this study, this familiarisation stage is useful in order to create some comfort with the technology. Furthermore, this approach helps to minimise the risk of students developing anxiety about the technology which can lead to a rejection of the technology (Igbaria and Zinatelli 1997). Having the direct influence of *Ease of Use* on *Behavioural Intentions* in mind, it seems appropriate to design training and support packages that focus on design and structural issues, but which are also simultaneously aligned with the subject's objectives. Instructional training and support appear important in the adoption stages of a technology but the influence probably diminishes over a prolonged period of exposure (Adams et al. 1992). This indicates that training needs to be intensified in those subjects where students are most likely to be exposed for the first time to the technology. Furthermore, in subsequent training the key messages should be reiterated and complemented through a stronger focus on the usability of the technology.

The fact that the sample in the current study was undertaking a first and a second year subject may explain the association found between *Ease of Use* and *Behavioural Intentions*. In particular the differences within the sample in relation to study progress would suggest that students who have progressed further in their studies are more comfortable with adopting the technology. Study progress, however does not seem to influence the Perceived Usefulness of WebCT nor the Behavioural Intention, indicating that an initial orientation phase may be required to help students to become accustomed to the technology itself and to the concept that WebCT forms part of the learning environment. Drennan et al. (2005) supported Adam's (Adams et al. 1992) view of the influence familiarity has on the acceptance of technology and suggests that the influence *Ease of Use* has on *Behavioural Intentions* gradually decreases with increased familiarity.

In addition to initial training, ongoing technical support is often seen as a key to minimising dissatisfaction with the technology. Nearly twenty years ago DeLone (1988) stated that the availability of technical support alone did not automatically result in greater success of technology but today the situation may be different. As is suggested by Cheung and Huang (2005) who found that support mechanisms led to greater use of

the technology and more effective learning. Thus as students become increasingly familiar with different applications of technology the key determinant for their use may be technical support whereas twenty years ago there may have been a variety of other factors which influenced use.

The results from the current study also draw attention to a number of other issues which relate to the use of technology. Firstly, a common misunderstanding seems to exist amongst educators that the use of technology correlates positively with academic outcome. In other words that the more time a student spends using the technology the better is the anticipated outcome. Similarly, it is assumed that students who do not engage in the technology will not perform as well as those who do. This might not necessarily be true and is probably determined by the degree of implementation of technology in the subject. As has been noted by Drennan et al. (2005), who focussed on subject satisfaction, satisfaction does not necessarily lead to improved academic performance nor is it likely that an enjoyment of the technology will necessarily lead to enhanced performance.

Secondly, students accept that the uptake of technology is not always a matter of choice. When the technology is integrated into a subject and a minimum use is required to pass the subject there is no immediate reward system for its extended use. Therefore, students may develop a particular functional or tactical attitude towards a technology that is not reflected in the *Behavioural Intentions* measures.

It seems likely that the disparity of relationships that were established in this study can be related back to characteristics of the sample. A separate study in which the degree of acceptance is measured across subjects and disciplines with a longitudinal focus is therefore suggested. Whilst personality cannot be treated as an extension to the Technology Acceptance Model, it seems worthwhile to discuss the student characteristics found in this sample.

5.3   Student Personality

Teaching staff in the Faculty of Business and Law at Victoria University, where the study was conducted, would agree that hospitality students differ in a number of ways from other student cohorts. This observation seems understandable, assuming that students are attracted to industries (and therefore fields of study) that mirror their personality. Moreover, a number of studies support this view (Whitney and Pratt 1987; Brymer and Pavesic 1990; Wiggins 1998; Borg and Stranahan 2002).

The results of the current study supported much of the earlier research into dominant personality functions of hospitality students and allow their findings concerning the nature and design of the hospitality learning environment to be expanded upon.

The mainly extraverted nature of hospitality students has been previously reported and the effect of this on the learning environment has been elaborated on in general terms (Janson 1994; Resing, Bleichrodt and Dekker 1999; Horton et al. 2005). It is interesting therefore that extraverted or introverted energy orientation did not impact on the acceptance of teaching technology examined in this study as it appealed to a similar extent to these two types of students. The results may not be sufficient to claim that the energy orientation does not influence the liking of such a technology but suggests that the technology examined here supported both groups of students. Extraverted students may be energised by social interaction and prefer a learning environment that is vibrant, lively and largely dependent on sharing ideas verbally but irrespective of their preferences appear able to benefit from a range of educational experiences. Another important issue may be the fact that the traditional asynchronous learning technologies do not usually provide opportunities for social interaction and thus one could assume that they are less appealing to the extraverted part of the student cohort. Whilst the WebCT application tested here was only used for asynchronous learning and, as such, was not intended to provide high levels of interaction it can therefore be argued that the technology in its supportive role only plays a marginal role in the facets of student learning. Thus it may be that provided the extraverted students have the option to interact in the classroom, they do not necessarily object to using the technology.

The sensing (S) versus intuition (N) preference reflects the student's basic learning style difference. Sensing students usually prefer to focus on concrete reality whereas the intuitive students prefer to focus on ideas and concepts. The strong representation (71%) of sensing students in the sample suggests that a learning environment that is designed to support the use of this function may be perceived more favourably by these students. For over a third of the students in the sample, sensing was either a dominant or an auxiliary function and the data analysis revealed that this subset of the sample scored differently on half the items on *Perceived Usefulness*, compared with the rest of the sample. The generally higher mean scores of this group on the items of difference could suggest that the technology tested here is more appealing to this group of students, or more closely aligned to their dominant cognitive function. It needs to be noted, however, that these results did not achieve statistical significance but may do so for a larger sample. The understanding that students prefer (and generally perform better) in a learning environment that is suitable for their preferred approach (be it personality or any other learning style categorisation) has been evidenced in previous literature and forms part of the core of knowledge in the area of student centred teaching practices. As such, a number of researchers have suggested that the knowledge of individual strengths and preferences of students can be used to create a learning environment that fosters those strengths, all with an aim to enhance the student learning experience. Others contradict this best-fit approach and suggest that in fact students should be enabled to use their inferior learning styles to become a holistic learner, rather than relying on natural strengths (Garner 2000). This will be further expanded on in the final chapter.

Hospitality education has struggled, and fought, for relevance since it became a higher education discipline, and its critics remain. Although the role of the University should not be merely to accommodate to the needs of the industry, one could argue that the existence of hospitality education is at least partly founded on the demands of the industry. Some authors go as far as to suggest that the industry is one of the true customers of the University, as graduates are moulded into employable individuals that then nurture the growth of the industry (Pizam 2007). Although this view might be an overstatement, there is some truth in the industry being an important stakeholder of the

universities and, as such, it should influence the development of curriculum. In practice, the role the industry plays is evident in groups such as Program Advisory Committees, in which experts from the industry provide input into curriculum design issues of the faculty. Tribe has acknowledged this fact by the inclusion of the industry in the 'curriculum space' (Airey and Tribe 2000).

Agreement regarding the influential role of the industry raises questions about the extent to which the design of the curriculum should focus on employability and to what degree on academic integrity, which is seen to be the traditional role of Universities. These two goals are seen by some as contradictory. Without doubt, many educational institutions would argue that employability skills are a top priority, as evidenced in many Universities' strategic plans. If that is the case, then one could argue that student centred curriculum design should attempt to focus on more generic employability skills rather than fostering idiosyncratic preferences. This, of course, requires not only a detailed knowledge of the graduate skills demanded by the industry, but also an understanding of the personality characteristics that may be advantageous in the industry. Educators may then be able to use the knowledge they have gained about the individual student to create a learning environment which focuses on developing skills that are complementary to those already supported by their personality. As evident in the results of the current study, the teaching technology as it is currently used may not be effective in achieving this.

Gillet et al. (2005) suggest the need for the development of better promotional opportunities for 'administrators' (ESTJ) which may also explain Martin's (1996) findings that ESTJ employees may stay longer within the industry. Further, the study of Gillet et al. revealed that, from a sample that was skewed towards a managerial level, the ISTJ-type outnumbered the ESFJ-type. Combining those findings one could suggest that the qualities of the ESTJ and ESFJ are sought after in the early years of the career, but some of the importance of single characteristics diminishes over time (such as extraverted behaviour). What remains constant is an STJ combination.

This study did not attempt to provide recommendations for career choice or career progression, but it seems important to acknowledge those characteristics which, in combination, can provide the graduate with the highest level of comfort to excel in the industry and to find means of fostering those characteristics.

The Jungian functions that shape the xSTJ are extraverted thinking (Te) and introverted sensing (Si). From the nature of the cognitive functions one can infer the impact they have on the learning environment, so these two dynamic functions may be treated as the key functions that should receive a developmental focus if the interpretations of career progression are correct.

Conceptually, WebCT has the potential to support the key functions of an STJ type and, if adequately deployed, should appeal to this group of students as they work very much in favour of the structured worldview of an SJ, while at the same time accommodates the quest for structured teaching and learning strategies (Keirsey and Bates 1984; Booth and Winzar 1993). The results somewhat supported this, although not all differences between groups were statistically significant.

Applying a temperamental focus, the dominance of SJ temperaments becomes apparent. Overall, the temperament taxonomy did not provide a significant advantage for the explanation of the model; probably because the groupings (four temperaments versus sixteen types) are not distinct enough or do not appropriately reflect the fine differences that exist in a learning environment. This raises the question whether the temperament is appropriate in understanding student differences and whether the four temperaments are sufficient in discriminating amongst the types. In this research, temperament merely formed a slightly different interpretation of the same data. In practice, the temperament approach has gained popularity through the open access to the Keirsey Temperament Sorter, whereas the MBTI requires accreditation and is a commercial instrument. One has to recognise that the explanatory power of the MBTI seems stronger, particularly through the identification of cognitive functions and type dynamics. This adds another dimension for interpretation and should therefore be favoured.

More importantly, the remaining types did not express a direct dislike for, or discomfort with, the technology. Hence, this opens the ground for any efforts to facilitate the technology in such a way that comfort in the functions of sensing and thinking can be developed with the students who do not have such a natural preference.

Modern online learning standards are designed to ensure a structure or network of resources that enhance and not hinder the learning experience (Jones 2002). As for the teaching component, a common development is the shifting of the assessment regime from learning and recall of content towards rewarding understanding of underlying concepts and the ability to conceptualise and synthesise ideas. If this progress took place in reality, it would create a favourable learning environment that is closely aligned with the concept of the 'reflective practitioner' (Airey and Tribe 2000).

Following the discussion, conclusions will be drawn in the last section of this chapter regarding the way teaching technology may be implemented to foster students' learning and enhance their experience and potential outcomes.

5.4   Conclusion and Recommendations

The current study has supported the existence of dominant personality types within a cohort of hospitality undergraduate students. Paired with the knowledge about the characteristics and requirements of the industry, this may help current and future educators to develop teaching practices and content that reflects the needs of the industry, whilst bearing in mind the predispositions of the students in the cohort. Whilst the personality traits were found not to be explanatory in the current study of teaching technology, their impact on more generic study approaches was evident in previous research. Thus the way in which personality impacts on teaching and learning need to be more fully explored. A particularly interesting issue for future research is whether personality has an impact on longer lasting academic outcomes, as this is the ultimate measure of learning success.

As predicted personality did not have an impact thereof on students' acceptance of teaching technology could not be established. It should, however, be noted that the current results could have been caused by other methodological weaknesses. For example issues which may have influenced the results were the small sample size in this study and the fact that the way in which WebCT was used in the units under study was rather rudimentary and may have meant that an attitudinal measurement would not return significant results. Moreover, it has to be recognised that this study only examined a small part of the student learning experience and that the learning environment is more complex than this. Overall, it appears that the students are generally equally accepting of the technology and thus, one could say that personality does not play a significant role for the design and deployment of teaching technology. As has been previously discussed similar findings were found by Stokes (2001). Thus the current findings provide some support for her conclusion that a digital learning environment suits and accommodates students with different temperaments. This would suggest that the use of technology in teaching may be valued by universities for financial reasons but will also be acceptable to most students when appropriately used and resourced. However, this issue needs to be researched further.

As previously mentioned Percey's (1997) research did not support this conclusion and found a relationship between students' learning styles and their preference for computer mediated training. Without additional research it is not possible to explain why this occurred. One explanation is that it has to do with the timing of these studies – those studies conducted more recently have found that personality does not impact on students' attitudes towards technology whereas the earlier study found the reverse. Thus as previously discussed the current students' familiarity with technology may mean that personality is no longer a determinant of their attitudes towards technology. However, if students were using technology for the first time personality may be more likely to have an impact on their attitude towards it. Alternative explanations are that with some student cohorts, such as those represented in Stokes' study (2001) and the current study, personality does not have an impact upon students' attitudes towards technology but this might not be found with all cohorts of students. It is also not clear whether the current results occurred because the use of technology was mandated. Thus whilst it would appear that technological approaches to learning may have wide appeal to students with different personality types this issue still needs to be investigated further.

It should also be noted that whilst personality appears unlikely to play an important role in students' acceptance of technology it will have an impact on learning which occurs in some contexts. Thus there is considerable number of previous studies which have demonstrated that individual differences may impact on student learning. Some of it applies to more generic learning styles (Hsu and Wolfe 2003), other research looks at cultural background and learning contexts (Lashley and Barron 2005; Barron et al. 2006), age or gender (Barr 1997). Although student centred learning is a concept repeatedly suggested in the educational literature, the reality seems to be that current teaching environments do not offer the flexibility required for the implementation of these concepts. Moreover, studies which have focussed on this issue have not conclusively demonstrated whether any negative effects which may be triggered by a mismatch between an individual's learning preference and the learning environment are sustained or only short lived. In fact, Garner (2000) advocated for deliberately challenging students by placing them in learning contexts which are complementary to their learning

preference, all with an aim to develop as a wholistic learner. On the other hand, it seems that students are reasonably adaptable to any specific learning environment, particularly at University where learning requirements may be different across units.

Based on the results of this study it can be reasonably argued that students only show differences in their attitudes towards a particular technology at their first encounter, particularly when the technology and the implications of its implementation on student performance are unclear. This is supported by the results of the Technology Acceptance Questionnaire in this study. Further, it can be argued that students entering the University these days are generally technology savvy, given the widespread exposure to Information and Communication Technology (ICT). However, it also has to be acknowledged that whilst the students may be technology accepting, they are not necessarily technology literate and as such a certain anxiety towards the use of technology for teaching and assessment purposes may remain. Therefore, if an increase in the use of teaching technology is deemed appropriate and serves a pedagogical purpose; such anxiety may be dealt with by carefully considering the introduction of the students to the technology. This approach is already evident in the literature and has been discussed in the context of technology training and acceptance, however, this study suggests that it is equally relevant to an educational context.

It is therefore recommended that future research into student personality turns away from a focus on (technology??), to develop innovative teaching strategies to implement the existing knowledge of cognitive preferences to improve the skills set of the graduates.

In summary, it is therefore suggested that future research focuses less on characterising single student cohorts or determining the existence of individual learning approaches in specific contexts. Neither should the impact of individual preferences on small elements of the learning environment be studied in more detail, but the existent knowledge about the individual student should be utilised to develop means and strategies to allow teachers to deploy innovative teaching approaches which foster the development of the graduates who possess the skills and abilities required by the industry.

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Appendices

Appendix A – MBTI® Type Table

ISTJ	ISFJ	INFJ	INTJ
Serious, quiet, earn success by concentration and thoroughness. Practical, orderly, matter-of-fact, logical, realistic and dependable. See to it that everything is well organised. Take responsibility. Make up their own minds as to what should be accomplished and work toward it steadily, regardless of protests or distractions.	Quiet, friendly, responsible, and conscientious. Work devotedly to meet their obligations. Lend stability to any project or group. Thorough, painstaking, accurate. Their interests are usually not technical. Can be patient with necessary details. Loyal, considerate, perceptive, concerned with how other people feel.	Succeed by perseverance, originality and desire to do whatever is needed or wanted. Put their best efforts into their work. Quietly forceful, conscientious, concerned for others. Respected for their firm principles. Likely to be honoured and followed for their clear convictions as to how best to serve the common good.	Usually have great minds and great drive for their own ideas and purposes. In fields that appeal to them, they have a fine power to organise a job and carry it through with or without help. Sceptical, critical, independent, determined, sometimes stubborn. Must learn to yield less important points in order to win the most important.
ISTP	**ISFP**	**INFP**	**INTP**
Cool onlookers - quiet reserved, observing and analysing life with detached curiosity and unexpected flashes of original humour. Usually interested in cause and effect, how and why mechanical things work, and in organising facts using logical principles.	Retiring, quietly friendly, sensitive, kind, modest about their abilities. Shun disagreements, do not force their opinions or values on others. Usually do not care to lead but are often loyal followers. Often relaxed about getting things done because they enjoy the present moment and do not want to spoil it by undue haste or exertion.	Full of enthusiasm and loyalties, but seldom talk about these until they know you well. Care about learning, ideas, language and independent projects of their own. Tend to undertake too much, then somehow get it done. Friendly, but often too absorbed in what they are doing to be sociable. Little concerned with possessions or physical surroundings.	Quiet and reserved. Especially enjoy theoretical or scientific pursuits. Like solving problems with logic and analysis. Usually interested mainly in ideas, with little liking for parties or small talk. Tend to have sharply defined interests. Need careers where some strong interest can be used and useful.
ESTP	**ESFP**	**ENFP**	**ENTP**
Good at on-the-spot problem solving. Do not worry, enjoy whatever comes along. Tend to like mechanical things and sports with friends on the side. Adaptable, tolerant, generally conservative in values. Dislike long explanations. Are best with real things that can be worked, handled, taken apart, or put together.	Outgoing, easy going, accepting, friendly, enjoy everything and make things more fun for others by their enjoyment. Like sports and making things happen. Know what's going on and join in eagerly. Find remembering facts easier than mastering theories. Are best in situations that need sound common sense and practical ability with people as well as with things.	Warmly enthusiastic, high-spirited, ingenious, imaginative. Able to do almost anything that interests them. Quick with a solution for any difficulty and ready to help anyone with a problem. Often rely on their ability to improvise instead of preparing in advance. Can usually find compelling reasons for whatever they want.	Quick, ingenious, good at many things. Stimulating company, alert and outspoken. May argue for fun on either side of a question. Resourceful in solving new and challenging problems, but may neglect routine assignments. Apt to turn to one new interest after another. Skilful in finding logical reasons for what they want.
ESTJ	**ESFJ**	**ENFJ**	**ENTJ**
Practical, realistic, matter-of-fact, with a natural head for business or mechanics. Not interested in subjects they see no use for, but can apply themselves when necessary. Like to organise and run activities. May make good administrators, especially if they remember to consider others' feelings and points of view.	Warm-hearted, talkative, popular, conscientious, born co-operators, active committee members. Need harmony and may be good at creating it. Always doing something nice for someone. Work best with encouragement and praise. Main interest is in things that directly and visibly affect people's lives.	Responsive and responsible. Generally feel real concern for what others think or want, and try to handle things with due regard for the other person's feelings. Can present a proposal or lead a group discussion with ease and tact. Sociable, popular, sympathetic. Responsive to praise and criticism.	Hearty, frank, decisive, leaders in activities. Usually good in anything that requires reasoning and intelligent talk, such as public speaking. Are usually well informed and enjoy adding to their fund of knowledge. May sometimes appear more positive and confident than their experience in an area warrants.

Adapted from MBTI Manual (Briggs Myers et al. 1999, p. 64)

Appendix A – MBTI® Questionnaire
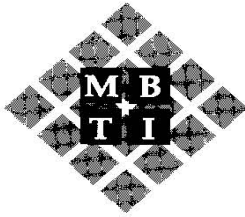
MYERS-BRIGGS
TYPE INDICATOR®

FIRST AUSTRALIAN EDITION

FORM K BOOKLET

Katharine C. Briggs
Isabel Briggs Myers

DIRECTIONS

There are no "right" or "wrong" answers to these questions. Your answers will help show how you like to look at things and how you like to go about deciding things. Knowing your own preferences and learning about other people's can help you understand where your special strengths are, what kinds of work you might enjoy and be successful doing, and how people with different preferences can relate to each other and be valuable to society.

Read each question carefully and mark your answer on a separate answer sheet. *Make no marks on the question booklet.* Do not think too long about any question. If you cannot decide on a question, skip it but be careful that the next space you mark on the answer sheet has the same number as the question you are then answering.

Read the directions on your answer sheet, fill in your name and any other facts asked for and, unless you are told to stop at some point, work through until you have answered all the questions you can.
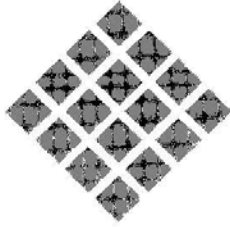
Part I

Which answer comes closer to telling how you usually feel or act?

1. When you are with a group of your good friends, do you

    (A) do more than your share of the talking, or
    (B) do less than your share of the talking?

2. Are you more attracted to

    (A) a person with a quick and brilliant mind, or
    (B) a practical person with a lot of common sense?

3. Do you look upon routine as

    (A) a desirable way of preventing mistakes, or
    (B) even less desirable than the mistakes?

4. Do you prefer to

    (A) understand the "big picture" before dealing with any details, or
    (B) master your own task before getting too involved with others' problems?

5. In choosing a place to live, are you more attracted by

    (A) the sounds and activity of the city, or
    (B) the quiet and solitude of the country?

6. When you go somewhere for the day, would you rather

    (A) plan what you will do and when, or
    (B) just go?

7. If you were a teacher, would you rather teach

    (A) fact-based courses, or
    (B) courses involving theory?

8. Are you usually

    (A) a "good mixer", or
    (B) rather quiet and reserved?

9. Do you prefer to

    (A) arrange dates, parties, etc., well in advance, or
    (B) be free to do whatever looks like fun when the time comes?

10. Do you usually get along better with

    (A) imaginative people, or
    (B) realistic people?

11. Do you more often let

    (A) your heart rule your head, or
    (B) your head rule your heart?

12. When you are with a group of people, would you usually prefer to

    (A) join in the talk of the group, or
    (B) talk with people individually?

13. Are you more successful

    (A) at dealing with the unexpected and seeing quickly what should be done, or
    (B) at following a carefully worked out plan?

14. Would you rather be considered

    (A) a practical person, or
    (B) an ingenious person?

15. In a large group, do you more often

    (A) introduce others, or
    (B) get introduced?

16. Do you admire more the people who are

    (A) conventional enough never to make themselves conspicuous, or
    (B) too original and individual to care whether they are conspicuous or not?

17. Does following a schedule

    (A) appeal to you, or
    (B) cramp you?

18. Do you tend to have

    (A) deep friendships with very few people, or
    (B) broad friendships with many different people?

19. Does the idea of making a list of what you should get done over a weekend

   (A) appeal to you, or
   (B) leave you cold, or
   (C) positively depress you?

20. Is it a higher compliment to be called

   (A) a person of real feeling, or
   (B) a consistently reasonable person?

21. Among your friends, are you

   (A) one of the last to hear what is going on, or
   (B) full of news about everybody?

[On this next question *only*, if two answers are true, mark both.]

22. In your daily work, do you

   (A) quite enjoy an emergency that makes you work against the clock, or
   (B) hate to work under pressure, or
   (C) usually plan your work so you won't *need* to work under pressure?

23. Would you rather have as a friend someone who

   (A) is always coming up with new ideas, or
   (B) has both feet on the ground?

24. Do you

   (A) talk easily to almost anyone for as long as you have to, or
   (B) find a lot to say only to certain people?

25. When you have a special job to do, do you like to

   (A) organise it carefully before you start, or
   (B) find out what is necessary as you go along?

26. Do you usually

   (A) value sentiment more than logic, or
   (B) value logic more than sentiment?

27. In reading for pleasure, do you

   (A) enjoy odd or original ways of saying things, or
   (B) like writers to say exactly what they mean?

28. Can the new people you meet tell what you are interested in

   (A) straight away, or
   (B) only after they really get to know you?

29. When it is settled well in advance that you will do a certain thing at a certain time, do you find it

   (A) nice to be able to plan accordingly, or
   (B) a little unpleasant to be tied down?

30. In doing something that many other people do, does it appeal to you more to

   (A) do it in the accepted way, or
   (B) invent a way of your own?

31. Do you usually

   (A) show your feelings freely, or
   (B) keep your feelings to yourself?

Part II

Which word in each pair appeals to you more?
Think about what the words mean, not how they look or sound.

32.	(A)	scheduled	unplanned	(B)	60.	(A)	sensible	fascinating	(B)
33.	(A)	gentle	firm	(B)	61.	(A)	forgive	tolerate	(B)
34.	(A)	facts	ideas	(B)	62.	(A)	production	design	(B)
35.	(A)	thinking	feeling	(B)	63.	(A)	impulse	decision	(B)
36.	(A)	hearty	quiet	(B)	64.	(A)	who	what	(B)
37.	(A)	executive	scholar	(B)	65.	(A)	speak	write	(B)
38.	(A)	congenial	effective	(B)	66.	(A)	uncritical	critical	(B)
39.	(A)	system	zest	(B)	67.	(A)	punctual	leisurely	(B)
40.	(A)	popular	intimate	(B)	68.	(A)	concrete	abstract	(B)
41.	(A)	listen	read	(B)	69.	(A)	changing	permanent	(B)
42.	(A)	convincing	touching	(B)	70.	(A)	wary	trustful	(B)
43.	(A)	statement	concept	(B)	71.	(A)	build	invent	(B)
44.	(A)	analyse	sympathise	(B)	72.	(A)	orderly	easygoing	(B)
45.	(A)	systematic	spontaneous	(B)	73.	(A)	foundation	spire	(B)
46.	(A)	justice	mercy	(B)	74.	(A)	quick	careful	(B)
47.	(A)	reserved	talkative	(B)	75.	(A)	theory	experience	(B)
48.	(A)	compassion	foresight	(B)	76.	(A)	sociable	detached	(B)
49.	(A)	systematic	casual	(B)	77.	(A)	sign	symbol	(B)
50.	(A)	calm	lively	(B)	78.	(A)	party	theatre	(B)
51.	(A)	benefits	blessings	(B)	79.	(A)	accept	change	(B)
52.	(A)	theory	certainty	(B)	80.	(A)	agree	discuss	(B)
53.	(A)	determined	devoted	(B)	81.	(A)	known	unknown	(B)
54.	(A)	literal	figurative	(B)	82.	(A)	things	words	(B)
55.	(A)	firm-minded	warm-hearted	(B)	83.	(A)	approve	question	(B)
56.	(A)	imaginative	matter-of-fact	(B)	84.	(A)	casual	correct	(B)
57.	(A)	peacemaker	judge	(B)	85.	(A)	affection	tenderness	(B)
58.	(A)	make	create	(B)	86.	(A)	active	intellectual	(B)
59.	(A)	soft	hard	(B)					
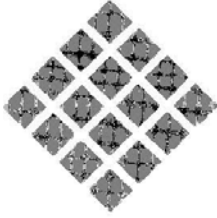
Part III

Which answer comes closer to telling how you usually feel or act?

87. Would you say you

 (A) get more enthusiastic about things than the average person, or
 (B) get less excited about things than the average person?

88. Do you feel it is a worse fault to be

 (A) unsympathetic, or
 (B) unreasonable?

89. Do you

 (A) prefer to do things at the last minute, or
 (B) find doing things at the last minute hard on the nerves?

90. At parties, do you

 (A) sometimes get bored, or
 (B) always have fun?

91. Do you think that having a daily routine is

 (A) a comfortable way to get things done, or
 (B) painful even when necessary?

92. When something starts to become fashionable are you usually

 (A) one of the first to try it, or
 (B) not much interested?

93. When you think of some little thing you should do or buy, do you

 (A) often forget it until much later, or
 (B) usually get it down on paper to remind yourself, or
 (C) always follow through on it without reminders?

94. Are you

 (A) easy to get to know, or
 (B) hard to get to know?

95. In your way of living, do you prefer to be

 (A) original, or
 (B) conventional?

96. When you are in an embarrassing situation, do you usually

 (A) change the subject, or
 (B) turn it into a joke, or
 (C) days later, think of what you should have said?

97. Is it harder for you to adapt to

 (A) routine, or
 (B) constant change?

98. Is it higher praise to say someone has

 (A) vision, or
 (B) common sense?

99. When you start a big project that is due in a week, do you

 (A) take time to list the separate things to be done and the order of doing them, or
 (B) plunge in?

100. Do you think it more important to be able

 (A) to see the possibilities in a situation, or
 (B) to adjust to the facts as they are?

101. Do you think the people close to you know how you feel

 (A) about most things, or
 (B) only when you have some special reason to tell them?

102. Would you rather work under someone who is

 (A) always kind, or
 (B) always fair?

103. In getting a job done, do you depend on

 (A) starting early, so as to finish with time to spare, or
 (B) the extra speed you develop at the last minute?

104. Do you feel it is a worse fault

 (A) to show too much warmth, or
 (B) not to have enough warmth?

105. When you are at a party, do you like to
    (A) help get things going, or
    (B) let the others have fun in their own way?

106. Would you rather
    (A) support the established methods of fixing problems, or
    (B) analyse what is still wrong and work on unsolved problems?

107. Are you more careful about
    (A) people's feelings, or
    (B) their rights?

108. If you were asked on a Saturday morning what you were going to do that day, would you
    (A) be able to tell pretty well, or
    (B) list far too many things, or
    (C) have to wait and see?

109. In deciding something important, do you
    (A) find you can trust your feelings about what is best to do, or
    (B) think you should do the logical thing, no matter how you feel about it?

110. Do you find the more routine parts of your day
    (A) restful, or
    (B) boring?

111. Can you keep a conversation going indefinitely
    (A) only with people who share some interest of yours, or
    (B) with almost anyone?

112. Do you
    (A) get real satisfaction out of doing a task before it actually has to be done, or
    (B) enjoy the speed and efficiency you acquire just before a deadline?

113. Do you value facts more as
    (A) being interesting in themselves, or
    (B) illustrating some principle or relationship?

114. Is it your habit to
    (A) confide in nobody, or at most in one person, or
    (B) have a number of friends you confide in?

115. When an unforeseen event forces you to set aside your day's program, do you
    (A) feel inconvenienced by a break in the program, or
    (B) welcome the unexpected diversion?

116. Are you more likely to speak up in
    (A) praise, or
    (B) blame?

117. Would you be more willing to take on a heavy load of extra work for the sake of
    (A) extra comforts and luxuries, or
    (B) a chance to achieve something important?

118. Do you generally prefer to
    (A) make your social engagements some distance ahead, or
    (B) be free to do things on the spur of the moment?

119. In contacts with your casual acquaintances, do you
    (A) aim to treat them with the same warmth that you use toward close friends, or
    (B) feel such indiscriminate warmth to be hypocritical, or
    (C) not use any particular warmth with any friends?

120. Do you get more annoyed at
    (A) fancy theories, or
    (B) people who don't like theories?

121. When a new situation comes up which conflicts with your plans, do you try first to
    (A) change your plans to fit the situation, or
    (B) change the situation to fit your plans?

122. Do you tend to say what you think or feel too
    (A) mildly, or
    (B) strongly?

123. Among your personal beliefs, are there
    (A) some things that cannot be proved, or
    (B) only things that can be proved?

124. When you finish a job requiring tools or special equipment, does putting things back where they belong strike you as
    (A) fun, or
    (B) a necessary chore, or
    (C) something that can be done later?

125. When you don't agree with what has just been said, do you usually

   (A) let it go, or
   (B) put up an argument?

126. In managing your life, do you tend to

   (A) undertake too much and get into a tight spot, or
   (B) hold yourself down to what you can comfortably handle?

127. When the truth would not be polite, are you more likely to tell

   (A) a polite lie, or
   (B) the impolite truth?

128. When you are helping in a group undertaking, are you more often struck by

   (A) the cooperation, or
   (B) the inefficiency,
   (C) or don't you get involved in group undertakings?

129. When you have to meet strangers, do you find it

   (A) pleasant, or at least easy, or
   (B) something that takes a good deal of effort?

130. Which mistake would be more natural for you:

   (A) to drift from one thing to another all your life, or
   (B) to stay in a rut that didn't suit you?

131. Would you have liked to argue the meaning of

   (A) a lot of these questions, or
   (B) just a few?

Appendix C – WebCT Acceptance Questionnaire

WebCT Acceptance Questionnaire

Thank you for participating in this research. The study aims at understanding student's attitude towards WebCT. In the first section you are asked to please provide some personal details.

Student ID	__ __ __ __ __ __ __	**Gender**	Male ( ) Female ( )
Course Code		**Date of Birth**	__ / __ / ____
(eg BBHM)	(__) (__) (__) (__)		
		Year of Study	1st 2nd 3rd 4th
Subject Code	BHO __ __ __ __	**(please circle)**	

Below you will find a number of statements. Please rate each statement on the scale given, where (1) represents "**strongly disagree**" and (5) "**strongly agree**" by marking the appropriate number (X).

Perceived Usefulness

	STRONGLY DISAGREE		NEITHER		STRONGLY AGREE
Using WebCT shortened the amount of time I spent on my study	(1)	(2)	(3)	(4)	(5)
Using WebCT for my studies improved my study performance	(1)	(2)	(3)	(4)	(5)
Using WebCT for my studies increased my learning output	(1)	(2)	(3)	(4)	(5)
Using WebCT for my studies increased my study effectiveness	(1)	(2)	(3)	(4)	(5)
Using WebCT made my studies easier	(1)	(2)	(3)	(4)	(5)
I found WebCT useful for my studies	(1)	(2)	(3)	(4)	(5)

Perceived Ease of Use

Learning to operate WebCT was easy for me	(1)	(2)	(3)	(4)	(5)
I found it easy to get WebCT to do what I want it to do	(1)	(2)	(3)	(4)	(5)
My interaction with WebCT was clear and understandable	(1)	(2)	(3)	(4)	(5)
It was easy for me to become skillful at using WebCT	(1)	(2)	(3)	(4)	(5)
I found WebCT Easy to use	(1)	(2)	(3)	(4)	(5)

Please turn over

Self Predicted Future Usage	*STRONGLY DISAGREE*		*NEITHER*		*STRONGLY AGREE*
I would prefer using WebCT for my future studies	(1)	(2)	(3)	(4)	(5)
I would prefer traditional delivery modes for my future studies	(1)	(2)	(3)	(4)	(5)
I would prefer traditional assessment modes for my future studies	(1)	(2)	(3)	(4)	(5)

All information collected in this survey is strictly confidential and will be used strictly for research purposes only and will not be shared with third parties. The study for which this information is collected has been approved by the Ethics Committee at Victoria University. Should you have any questions or suggestions in regards to this survey, please contact florian.aubke@vu.edu.au