# MANAGEMENT EDUCATION VIA THE INTERNET: FACTORS FACILITATING AND INHIBITING THE ADOPTION OF WEBCT AT A FACULTY IN A HIGHER EDUCATION INSTITUTION

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## ABSTRACT

*The emergence of the Internet and the World Wide Web in particular impact increasingly on the activities of commerce and industry and in the process also change the manner in which courses are delivered in higher education. Web-based learning has become an increasingly popular mode of delivery for educational programmes in higher educational institutions. Management education (i.e. academic courses offered to students in Management Faculties at higher education institutions) can benefit from an integrated technology, supported by systems to prepare future managers for the corporate world. Very often organisations are so impressed with the opportunities that technology can offer, that they overlook the climate in which it will be implemented. The successful deployment of e-learning technology is amongst others, dependent on the understanding of certain antecedent factors that influence technology adoption.*

*The aim of this study was to investigate the relationship between certain antecedent factors and the adoption of a specific technology called WebCT among lecturers within a business faculty at a higher education institution. The research strategy was a single-site case study and the methods were triangulated, using individual semi-structured interviews and a survey questionnaire. The study established certain facilitating and inhibiting factors and their impact on the perceived ease of use and the perceived usefulness of WebCT.*

*Adoption of innovation theories are well documented in the literature. The "diffusion of innovation" theory (Rogers, 1983) and the "Technology Acceptance Model" (Davis, 1989) are amongst those theories that have been tested in diverse studies and are relevant to the context of this research. It was therefore used as the basis for this study.*

# 1. INTRODUCTION

Many higher education institutions (HEIs) are increasingly adopting electronic learning (e-learning) as a mode of delivery in an attempt to enhance the learning process. Commerce, education and technology have developed a symbiotic relationship, i.e. each element will continue to contribute to the development of online education (Helmi, 2002; Pather and Erwin, 2000). It has been argued that as managers are turning to technology for solutions to new problems, the education of future managers should integrate technology supported learning processes (Sharma and Meleyeff, 2003). Pather and Erwin (2000) suggest that South African HEIs start taking steps to implement their programmes in a technologically enhanced learning environment, using resource-based learning methods. This is aligned to one of the priorities indicated by the objectives of South Africa's National Plan for Higher Education: "To produce graduates with the skills and competencies required to participate in the modern world in the 21st century" (Ministry of Education, 2001). One cannot dispute that learning through the Internet does not provide a "total solution", nor does it guarantee analytical and critical thinking or match the variety of interactions in seminars and tutorials. However, it has the potential to offer new means of self-expression and new opportunities for student engagement with course material (Mann, 2000).

The aim of this research project was to investigate the relationship between certain antecedent factors and the adoption of a specific technology, in this case WebCT within a specific faculty at a HEI. WebCT, a Web-based software programme, is aimed at assisting educators to effectively manage courses, enhance the learning programme, manage student progress, conduct on-line evaluations, and make course material available and evaluations accessible for the convenience of lecturer and student. (WebCT, 2004:[Online]). The Cape Peninsula University of Technology (CPUT) is a HEI, which according to its mission statement, "provides and facilitates high level of career and technology education and training in partnership with its stakeholders" (CPUT, 2005: [Online]). The Faculty of Management is the largest faculty at the Cape Town campus, comprising of 11 departments, and 73 academic members. The focus of

this research was on the latter; the experiences, opinions and ideas of ***lecturers*** regarding certain key factors influencing WebCT adoption in the faculty. The research question was formulated as follows:

> In the Faculty of Management at the Cape Town, Mowbray and Granger Bay campuses, how do selected factors, including perceived ease of use (PEOU) and perceived usefulness (PU), relate to the non-adoption of WebCT by academics?

## 2. LITERATURE REVIEW

Turner and Turner (2002) argue that one of the persistent problems in synthesising and applying research in this field is the inconsistent use of terminology. Different terminology is often used to define adoption, such as "uptake", use, acceptance, implementation, routinisation, acquisition and assimilation. Adoption can also refer to technology use by end-users, or the decision to purchase technology. According to Rogers (1983) adoption is "a decision to make full use of an innovation as the best course of action available, while rejection is "a decision not to adopt an innovation". Instead Davis (1989) refers to adoption as "user acceptance". Klein and Sorra (1996) are of the view that organisations adopt innovations, but individuals within the organisation implement the technology. *As a result of the inconsistent use of terminology in the literature, for the purposes of this research the term adoption will refer to implementation of the technology by individuals or end-users.* The term "end-users" refers to the academic staff of the Management Faculty, and the term technology refers to WebCT.

### 2.1 HISTORICAL PERSPECTIVE: TECHNOLOGY ADOPTION

The theoretical foundation for most technology adoption research is found in the diffusion of innovation literature (Ely, 1999; Moore and Benbasat, 1991; Schauer-Crabb 2002; Harris, Donaldson and Campbell, 2001). According to Moore and Benbasat (1991) one of the most cited reviews of the perceived characteristics in the adoption and diffusion of innovation literature is that of Rogers (1983). Rogers argues that by asking "why" a technology was adopted, the understanding of why some individuals are more receptive to an innovation than others will be increased (Schauer-Crabb, 2002). The

literature suggests that the motivation to implement technologies, such as e-learning, is not always clearly defined: adoption takes place without fully understanding what purpose it serves and what the ultimate consequences of adopting such technologies are. Some of these issues are addressed "Technology Acceptance Model (TAM)", which is based on the "diffusion of innovation" literature. The TAM is designed by Fred Davis (1989) and is one of the most influential research models in studying the determinants of information technology usage (Chau, 2001; Harris et al., 2001). It provides a foundation to outline the impact of situational and dispositional factors on internal beliefs, attitudes (A) and behavioural intentions (BI) (Harris et al., 2001). In the context where acceptance is voluntary, the most pertinent question is: "What causes people to accept or reject information technology?"(Davis, 1989). Various studies over the years have identified predictors of user adoption such as: ease of use, systems design quality, perceptions of usefulness, download delay, data security, navigation, instability of the system, responsiveness, information content and accuracy and interactivity (Saeed, Hwang and Yi, 2003). According to Davis (1989), perceived ease of use (PEOU) and perceived usefulness (PU) have been identified as significant indicators of adoption.

**Perceived Usefulness (PU):** Perceived usefulness refers to the user's belief that the utilization of a particular system would increase performance. This follows from the definition of the word useful: "capable of being used advantageously" (Davis, 1989). According to Swanson (1987) items such as "useful", "relevant", "important" and "valuable", parallel perceived usefulness (cited in Davis, 1989). It has been argued that perceived usefulness is a relative term and relates to the term "relative advantage" as outlined by Rogers (1983), i.e. the extent to which benefits are seen as outweighing costs (Moore and Benbasat, 1991; Rogers, 1983). Rogers (1983) argues that it's irrelevant whether the innovation has a great deal of "objective" advantage. What matters is whether the individual perceives the innovation as beneficial. In this research the perceived usefulness refers to the belief of lecturers that the use of WebCT would increase job performance and will add educational value to their work. If too much time and effort were invested into WebCT, compared to the expected net benefit, the innovation would not be perceived as useful.

**Perceived Ease of Use (PEOU):** PEOU refers to the degree to which a user or potential user believes that the utilization of a particular system would be without much effort. This follows from the definition of "ease": freedom from difficulty or great effort (Davis, 1989). The assumption is that if an application is perceived to be easier to use than another, it is more likely to be accepted by users. It relates to "complexity" identified by Rogers (1983) as the degree to which an innovation is perceived as relatively difficult to understand and use (Davis, 1989; Moore and Benbasat, 2001). Evidence showed that skill played a major role in technology acceptance (Igbaria et al., 1999). The importance of PEOU is supported by Bandura's (1982) extensive research on self-efficacy, defined as "judgments of how well one can execute courses of action required to deal with prospective situations" (cited in Davis, 1989). Davis (1989) is of the view that, according to this definition, self-efficacy is similar to PEOU, while Chau (2001) views self-efficacy as an antecedent factor to PEOU and PU.

## 2.2 SITUATIONAL AND DISPOSITIONAL FACTORS

Situational constraints are those factors that are largely beyond the control of individual users, e.g. lack of resources, faulty equipment and time constraints that restrict the range of the individual's acceptance of the innovation (Jawahar, 2002). Dispositional factors refer to preconceived attitudes and established behaviour characteristics of the user that may influence user acceptance and performance, e.g. the influence of attitudes, aptitudes, gender, learning styles, experience, cognitive styles, and education (Chau, 2001; Jawahar and Elango, 2001; Jawahar, 2002; Harris et al., 2001; Harris, 2000). Chau (2001) suggests that based on the results of prior studies on TAM, it seems reasonable to put PEOU and PU, the two key variables in TAM, as the mediating variables between the antecedents (i.e. situational and dispositional variables) and the attitude variable. In this study two situational variables (i.e. Time constraint and the Complexity and ineffectiveness of training) and two dispositional variables (i.e. Computer competency and Attitude towards computers) are explored.

**Complexity and ineffectiveness of training**: Training is an essential contributor to the productive use of computer systems and technology (Jawahar, 2002). Training literature

reports consensus by trainers that the more complex, ineffective and confusing the training, the more unlikely the user will implement the skill (Jawahar, 2002; Tannenbaum and Yukl, 1992; Klein and Sorra, 1996; Ely, 1999). Through effective training, the lecturers can become more knowledgeable about the technology in addition to the acquisition of the skills to operate and understand the technology (Cronje and Murdoch, 2001). The question arises whether training should be customized or whether it should be "one size fits all"(Aggarwal, 2003; Rosenberg, 2001). Aggarwal (2003) argues that matching the lecturer's skills to the training required is not a generic process. To foster life-long learning and acquisition of skills, specifically related to technology, employees should "seek" training. Training may require matching employee's current skills to skills required to use the innovation. In order to create and foster a climate for technology acceptance, training should not only be uncomplicated and readily available, but additional assistance in the innovation use should be available following the training (Klein and Sorra, 1996).

**H1:** The complexity and ineffectiveness of training of WebCT impact negatively on the perceived ease of use of WebCT

***H2:*** The complexity and ineffectiveness of training of WebCT impact negatively on the perceived usefulness WebCT

**Time constraint:** The time allocated to learn and become proficient in new skills is likely to affect how well lecturers learn and use their skills. Time constraint is a real factor because of its potential to inhibit acceptance and therefore performance (Jawahar, 2002; Harris et al., 2001). Time for training, availability of time to experiment and flexible time to search for information, were identified as influencing factors in adoption strategies for web technology (Sherry, Billig, Tavalin and Gibson, 2000; Saeed et al., 2003; Klein and Sorra, 1996; Ely, 1999; Cronje and Murdoch, 2001). After training the user needs opportunities to practice. However with time poverty, the retention of the training material is often impossible (Pentland 1989 cited in Jawahar, 2002; Pather and Erwin, 2000). Time is needed to acquire the knowledge and skills, to use, adapt, integrate and reflect upon what users are doing. This will mean "good" time, "company" time, "paid" time arranged for by the organisation where the innovation will be implemented

(Ely, 1999). Lecturers often voice their concern that because of time constraints they are unable to fit technology into their busy schedules and to "cover the curriculum" if it involves so much action research on technology in the classroom (Broere et al., 2001).

**H3**: Time constraint impacts negatively on perceived ease of use of WebCT

**H4**: Time constraint impacts negatively on the perceived usefulness of WebCT

**Attitude towards computers:** A variety of terms are used in the literature to describe the negative attitudes associated with computers – computer anxiety, cyberphobia, computerphobia, technophobia, etc. Jay (1981), one of the first to use the term "computerphobia", provided the following definition: "(a) resistance to talking about computers or even thinking about computers, (b) fear or anxiety toward computers, and (c) hostile or aggressive thoughts about computers" (cited in Orr, Allen and Poindexter, 2001:191). Individuals who hold favourable attitudes towards working with computers are more likely to practice and learn computer skills, and achieve higher levels of performance on tasks that require the use of those computer skills, than those who hold less favourable attitudes (Jawahar, 2002). The general attitude towards computers affects the behavioural intention of using a technology (Chau, 2001; Sherry et al., 2000; Roth et al., 2003; Orr et al., 2002). Personal factors that novice users of technology usually express include the fear of looking foolish in front of their colleagues or the students (Mulqueen 2001 cited in Broere, et al., 2003).

**H5**: Participants attitude towards computers impacts positively on the perceived ease of use of WebCT

**H6**: Participants attitude towards computers impacts positively on the perceived usefulness of WebCT

**Computer competency:** Computer competency is the ability, skill and knowledge to operate the computer. Rosenberg (2004) argues that the implementation of knowledge and skills to operate the computer varies. In order for e-learning to become a significant part of learning, it is important that competence – the learning, practice and demonstration of performance – is matched to the "right delivery vehicle" (Rosenberg, 2001), which refers to the Web-based application. Although Rosenberg (2001) refers to

general competence in e-learning, computer competence forms an integral part of it. Despite the widespread influx of technology in all segments of our society, the literature often reports high levels of anxiety and negative attitudes about using computers (Orr et al., 2001). The literature refers to "computer anxiety" as an indicator for lack of computer literacy (Jawahar and Elango, 2001). Computer competence can manifest itself through personal innovativeness, playfulness and computer skill, which are determinants of use, achieving effects through ease of use and usefulness (Saeed et al., 2003:5).

**H7**: Self-rated computer competency positively impacts on the perceived ease of use of WebCT

**H8**: Self-rated computer competency positively impacts on the perceived usefulness of WebCT

**WebCT utilisation:** Utilisation refers to the actual or perceived use of the innovation. Davis (1989) conducted two studies where the participants were asked to self-report their degree of usage of two different technologies. Both studies found that the usage was significantly correlated with both PEOU and PU. The relative strength of the usefulness-usage relationship compared to the ease of use-usage relationship was one of the most significant findings of the two studies. Davis (1989) argues that the prominence of PU is self-explanatory because users are driven to adopt a technology primarily because of its functionality and secondarily for how easy or hard it is to get the system to perform those functions. As argued in the previous sections, users are often willing to cope with a degree of difficulty of use, if the system provides the requisite value and usefulness. Harris, et al. (2001) found that the utilisation of WWW-technology is predicted by the users' attitude to the use of the technology. By using the TAM, they found that utilisation gives insight into the various antecedent factors of PEOU and PU, such as demographic variables (e.g. age, gender, occupation), apprehension towards the technology, time constraint, and organisational support.

**H9:** Perceived ease of use impacts positively on WebCT utilisation

**H10:** Perceived usefulness impacts positively on WebCT utilisation

## 3. RESEARCH DESIGN AND APPROACH

The method of inquiry in this research included both qualitative methods, i.e. semi-structured interviews, and quantitative methods, i.e. a survey questionnaire. After the pilot research, the semi-structured interviews were conducted. Stratified sampling was applied, the departments were the subgroups and the participants were randomly selected from each subgroup (Cooper and Schindler, 1998). Each person's name in a specific department was placed into a box and drawn. Every person had an equal chance of being selected (Cooper and Schindler, 1998). No distinction was made between users and non-users of WebCT in the faculty. The basis for the inclusion of users was that WebCT is a fairly new technology at the institution and that users would also have certain experiences, opinions and ideas around WebCT adoption, which could be significant for this research. With the analysis of the qualitative data, the code-and-retrieve technique was used to explore categories and relationships, structured in a table to assist with the analysis. "The code-and-retrieve process consists of labeling passages of data according to what they are about or other content of interest in them (coding or indexing), then providing a way of collecting identically labelled passages (retrieving) (Denzin and Lincoln, 1994). The interviewees were asked three open-ended questions.

- Do you think it is easy to use WebCT, and why?
- Do you think WebCT is useful, and why?
- Are there other factors that you think inhibit or facilitate the use of WebCT?

With regard to the questionnaire, an even number of categories (six) was used to force respondents to pick a side i.e. to avoid a neutral (the so-called neutral response set) without assuming that 3.5 is a midpoint value. The "don't know" option was included for selected items following the testing of the pilot questionnaire when it became apparent that provision had to be made for a "Don't know" option because of many respondents' lack of knowledge of WebCT. The coding and interpretation of the 'don't know' responses posed a number of challenges because of the large number of respondents who selected this option. Likert originally used a seven-point scale and a value of 4 was given for non-responses (Kerlinger, 1973). In the present study a number of respondents chose "don't know" and, following Kerlinger, a score of 3.5 was allocated to these responses. A zero cannot be allocated to these since this will imply that the response was even more

extreme than “Extremely unlikely”, which, in turn may slant or biases the total score to a very unrealistic value. In order to establish whether the 3.5 value biased the findings a separate analysis was conducted excluding the respondent’s answering “don’t know”. Davis (1989) reported that the instrument he developed from the TAM has shown to be reliable through psychometric testing. PU and PEOU are standard instruments used in the literature and their psychometric properties will not be verified in this study, nor, for purpose of simplicity, will an attempt be made to construct a Thurstone scale of “equal appearing intervals”. The objective was, in the words of Kerlinger (1973:496), “to place the respondent somewhere in the agreement continuum” so that relationships can be suggested and a model verified.

# 4. RESULTS OF QUESTIONNAIRE AND INTERVIEWS

The questionnaire was distributed to all 69 lecturers in the faculty and 52 responded. The four pilot participants were excluded, because they were already familiar with the questions. The 13 interviewees also completed the questionnaire because the population is already relatively small, and they could make a contribution to the data that had not explicitly been asked for (e.g. demographic information) in the interview. The response rate was 75%, which is good rate considering the work pressure people are generally under in the last term of the year.

## 4.1 DEMOGRAPHICS

The details of the variables in the questionnaire, the description, mean, standard deviation and Cronbach’s Alpha, are tabulated in Table 4.1. The level for significance was chosen at $p < 0.05$. The Cronbach Alpha has been reported to get some idea of reliability although it is acknowledged that this is merely a measure of internal consistency (Kerlinger, 1973:496). A Cronbach Alpha greater than 0.9 suggests that the measure has an extremely high internal consistency. The implication is that the items making up the measure are too uniform.

Table 4.1: Description of Variables

| VARIABLE | DESCRIPTION | MEAN | STD. DEV | CRON-BACH • |
|---|---|---|---|---|
| Gender | (0=Female, 1=Male) | 1.52 | 0.50 | |
| Age | (1=21-25yrs;2=26-30yrs3=31-40yrs;4=41-50yrs;5=>50yrs) | 3.42 | 1.04 | |
| WebCT Training | (1=Yes;2=No) | 0.25 | 0.44 | |
| WebCT competence | (4=Advanced;3=Good;2=Average;1=Low;0=None) | 0.82 | 0.97 | |
| Technology competence | Word Processor; Spreadsheet; Email; Web 3=High; 2=Average; 1=Low | 9.51 | 2.27 | .84 |
| Complexity and ineffectiveness of training | Adapted from Jawahar (2002). A 4-item 6-point scale measuring the complexity and ineffectiveness of training - Training complex; Instructor explained clearly (reverse coded); More productive after training (reverse coded); Confused when on my own. 6=Completely agree; 5=mostly agree; 4=slightly agree; 3=slightly disagree; 2=mostly disagree; 1=Completely disagree. "Don't know" was given independently with a mid-point score of 3.5. No of respondents=51 | 3.40 | 0.52 | .60 |
| | Alternative analysis: "don't know" excluded. No of respondents=17 | 3.47 | 0.87 | .78 |
| Time constraint | Adapted from Jawahar (002). A 4-item 6-point scale measuring time constraint - Lack of time; More time enhance effectiveness; Too much time to learn and understand; Current workload. 6=Completely agree; 5=mostly agree; 4=slightly agree; 3=slightly disagree; 2=mostly disagree; 1=Completely disagree. No of respondents=51 | 4.16 | 1.01 | .64 |
| Attitude towards compuers | Adapted from Chau, (2001). A 5-item 6-point scale measuring attitudes towards computers - Bright era; Educational purposes; Unlimited possibilities; Get things done easier; Exploring new things. 6=Completely agree; 5=mostly agree; 4=slightly agree; 3=slightly disagree; 2=mostly disagree; 1=Completely disagree. No of respondents=52 | 5.47 | 0.65 | .85 |
| Computer Competency | Adapted from Davis (1989). A 5-item 6-point scale measuring the perceived competence. The "don't know" option was excluded for the first two items - Working with computers is easy; Computers enhance effectiveness; Learn to operate easy; Current computer competency find WebCT useful; Current computer competency allow to learn and operate WebCT. 6=Completely agree; 5=mostly agree; 4=slightly agree; 3=slightly disagree; 2=mostly disagree; 1=Completely disagree. "Don't know" option was given independently for the last two items and was given a mid-point score of 3.5. No of respondents=52 | 4.68 | 0.83 | .87 |
| | Alternative analysis: "don't know" excluded. No of respondents=44 | 4.79 | 0.76 | .87 |
| Perceived ease of Use | Adapted from Davis, (1989) and Chau, (2001). A 4-item 6-point scale measuring the perceived ease of use of WebCT - Get WebCT to do what I want it to do; Clear and understandable; Flexible to work with; Easy to become skilful. The same points were used as for PU. No of respondents=52 | 3.67 | 0.76 | .82 |
| | Alternative analysis: "don't know" excluded. No of respondents = 30 | 3.89 | 0.86 | .82 |
| Perceived usefulness | Adapted from Davis, (1989) and Chau, (2001). A 4-item 6-point scale measuring the perceived usefulness of WebCT – Improve job performance, Easier to do job, Increase productivity; Useful in job. 6=Extremely likely;5=quite likely;4=slightly likely;3=slightly unlikely;2=quite unlikely;1=extremely unlikely. "Don't know" was given a mid-point score of 3.5. No of respondents=51 | 4.22 | 0.97 | .92 |
| | Alternative analysis: "don't know" excluded. No of respondents = 37 | 4.51 | 1.02 | .89 |
| WebCT utilisation | One item adapted from Davis (1989). How often do you use WebCT in your current course/offering? 1=Monthly; 2=Once a week; 3=Several times a week;4=Once a day;5=Several times a day; 0=None | 0.71 | 1.23 | |

Fifty two percent of respondents were female. Out of the total population of females, 77,8 % responded, compared to 72,7% males from the male population. The majority of the respondents fall within the 31 – 40 age group. This could be advantageous since they could be expected to be more receptive to the recommendations that will result from this study than the "older" age group. In Section A of the survey lecturers had to indicate whether they have been for WebCT training, and when the training was undertaken. Twenty five percent of lecturers have gone for WebCT training but only 15,4% indicated ***when*** the training was undertaken. This is of particular importance since the longer the delay of the implementation of the new skill and knowledge acquired during training, the more difficult it becomes to use the technology.The perceived competence (self-rated) with regard to WebCT is generally low: "no competence" rated by 46,2%, which could be related to the low attendance at training sessions as only 25% of lecturers have gone for WebCT training as pointed out above. This is significant because the e-learning department regularly advertises WebCT training sessions throughout the institution. Training is the starting point for most users to acquire the foundation knowledge and skills to learn and understand WebCT. Twenty-six respondents (50%) regard themselves highly competent with the World Wide Web. This is contrary to WebCT competence, as 77% of respondents regard themselves as having no or low competence levels with WebCT, which could imply that there are significant competency barriers to adoption. The majority of the respondents rated their competence with regard to other technology as average or advanced, compared to low or no competence with regard to WebCT.

### 4.2 WEBCT UTILISATION

The majority of the respondents are currently not using WebCT. Item A12 of the questionnaire established the frequency of using WebCT: "How often do you use WebCT in your current course/offering?" The responses received indicate that 65% are non-users. In the open-ended interviews a higher proportion (77%) are currently non-users.

## 5. HYPTHOTHESIS TESTING

The hypotheses were tested using bivariate correlation analysis. Spearman's rho was also applied considering extreme scores, to allow for the cases where the responses for "don't know" appeared markedly high. This was ascribed to the fact that a significant number of staff members do not use WebCT, have limited knowledge about it and have never been for training, even though the e-learning department advertises WebCT training on a regular basis. Table 4.7 summarizes the hypotheses supported and rejected based on the questionnaire and interviews.

## 6. AN ALTERNATIVE ANALYSIS

In the previous analysis the "don't know" option was scored as a mid-point value and the justification for this value was given under section 4.2. "Don't know", is different to "undecided". With "undecided" people do have an opinion but cannot make a selection. With "don't know", people do not have an opinion because lack of knowledge and ignorance. Given this, the high number of "don't know" answers could distort the interpretation of the data if coded as a mid-point. For this reason, an alternative analysis is provided where "don't know" answers have been excluded. The results do not suggest significant differences between the means and the standard deviations of the previous analysis (don't know option included) and the alternative analysis (see Table 4.1). However, the hypotheses tested in this analysis, indicate that contrary to the previous analysis, H2 is supported and H9 is not supported (see Table 4.7). A discussion for these inconsistencies follows: **H2:** It is hypothesised that the complexity and ineffectiveness of WebCT training will negatively influence PU of WebCT. In this analysis because of the exclusion of the "don't know" option, only 17 responded, compared to 51 (see Table 4.1). This implies that these respondents have knowledge about WebCT and its usefulness. In the analysis where all the responses were taken into account, the hypothesis was not supported. A plausible explanation for this could be that because of the high incidence of "don't know", lecturers do not have enough knowledge to establish whether WebCT training is a precondition to the perceived value and benefits of using the technology. Lecturers could also have the perception that a certain level of computer competency and familiarity with Web-based technology must first be acquired before the usefulness of WebCT can be established. **H9:** The hypothesis that PEOU of WebCT will positively

impact on WebCT utilisation, is not supported in the alternative analysis. This implies that ease of use does not presuppose utilisation. About 57% (30 out of 52) of the respondents indicated "don't know" on the PEOU questions (see Table 4.1). The explanation for this could be that lecturers that are familiar with WebCT will use it more for its usefulness and benefit and not because it is easy to use. The literature supports this notion that users are often willing to cope with a degree of difficulty of use, if the system provides the requisite value and usefulness.

This analysis proves to be a better reflection of the relationships between the identified variables, PU and PEOU, because it reflects the lecturers that have knowledge of WebCT even though they may not be active users. On the other hand, ignorance and lack of knowledge about WebCT is a reality in the faculty and cannot be ignored, as the intention of this study was to establish the reasons for the ignorance and how it impacts on non-adoption of WebCT. Because of the relative small size of the population of the alternative analysis, the findings cannot be generalized.

## 7. DISCUSSION

**Complexity and ineffectiveness of training:** The majority of the respondents have limited knowledge of WebCT training, as indicated by the high level of "don't know" responses. Both analyses identified Complexity and ineffectiveness of training as a significant inhibiting factor to PEOU. However, contrary to the alternative analysis, the "all responses" analysis did not find complexity and ineffectiveness of training as an inhibitor to PU. Participants felt that in order to perceive WebCT as easy, training should be uncomplicated, hence the significant correlation to PEOU. This is consistent with studies conducted by Jawahar (2002) and Tannenbaum and Yukl (1992). Jawahar (2002) found that perceived complexity of training to use database software was negatively related to technology utilisation. Even though Jawahar's (2002) study did not test PEOU and PU, but focused directly on utilisation, it does have significance because this study ultimately focused on WebCT utilisation through the perceived characteristics.

In the interviews, four of the lecturers that went on training did not find the training too difficult, but expressed the view that computer competency is necessary in order to endure the training. There is no statistically significant correlation between the Complexity and ineffectiveness of training and PU of WebCT. Even though the majority of the lecturers do not have enough knowledge about WebCT, many lecturers are skeptical of its educational value. One can argue that the educational value, or lack thereof, can only be discovered once one knows more about and have used WebCT and are then able to make an informed assessment of its value. User-satisfaction may then only occur once the user is exposed to the technology, e.g. through training and implementation. Even in the initial adoption stage, users can form an opinion about WebCT's usefulness, and then decide whether or not it is satisfactory for their educational purpose.

**Time constraint:** The correlation between Time constraint and PEOU and PU respectively were not statistically significant. This finding is consistent with findings by Harris et al (2001) whose study found insignificant correlations between "time" and WWW utilisation, through the perceived characteristics of TAM. However, in the same study "time" was identified as a significant predictor of e-mail utilisation. Harris et al., argue that because their study was limited to health care professionals working in a rural area, other factors such as lack of physical and financial resources could have contributed to the lack of time. With regard to Time constraint and PEOU, a possible explanation for the statistically insignificant correlation would be that because lecturers have limited knowledge of WebCT, they could therefore not make an informed decision whether WebCT is easy or difficult to use. The perceived difficulty of WebCT may not be because of time poverty, but because of ignorance regarding WebCT, i.e. the perception that web-based or Internet applications are complicated.

Table 4.7: Hypothesis Testing

| **HYPOTHESES** | | | | |
|---|---|---|---|---|
| | **All responses included** | | **Don't know excluded** | |
| **PERCEIVED EASE OF USE** | **Spearman correlation** | **Hypothesis** | **Spearman correlation** | **Hypothesis** |
| H1: Complexity and ineffectivenss of training negatively impacts on PEOU | -.302(**) | Supported | -.589(**) | Supporte |
| H3: Time constraints impact negatively on PEOU | -.163 | Not supported | -.223 | Not suppo |

| | | | | |
|---|---|---|---|---|
| H5: Attitude towards computers impacts positively on PEOU | .363(***) | Strongly supported | .317(**) | Supporte |
| H7: Computer Competency positively impacts on PEOU | .635(***) | Strongly supported | .772(***) | Strongl supporte |
| **PERCEIVED USEFULNESS** | | | | |
| H2: Complexity and ineffectiveness of training negatively impacts on PU | -.145 | Not supported | -.550(**) | Supporte |
| H4: Time constraints impacts negatively on PU | .119 | Not supported | -.013 | Not suppo |
| H6: Attitude towards computers positively impacts on PU | .224(*) | Moderately supported | .183 | Not suppo |
| H8: Computer Competency positively impacts on PU | .207(*) | Moderately supported | .183 | Not suppo |
| **WEBCT UTILISATION** | | | | |
| H9: PEOU impacts positively on WebCT utilisation | .253(**) | Supported | .034 | Not suppo |
| H10: PU impacts positively on WebCT utilisation | .519(***) | Strongly supported | .366(**) | Supporte |

* Correlation is significant at the 0.1 level (1-tailed).
** Correlation is significant at the 0.05 level (1-tailed).
***Correlation is significant at the 0.01 level (1-tailed).

As established, Time constraints do not have a statistically significant correlation to PU of WebCT. The same argument can be used as with PEOU discussed above: lack of information about WebCT's usefulness and not because of time poverty. This could imply that if lecturers are aware of the usefulness of WebCT, they will more likely make time available to use it. Paradoxically, the majority of the interviewees were of the view that time is needed to find out whether WebCT is educationally functional, irrespective whether it is easy to use. This notion is supported by Davis (1989), suggesting that no amount of ease will compensate for usefulness. There is a greater emphasis on usefulness in terms of investing time on something new. In addition, this factor proved to be important in the open-ended sections of the survey. A significant number of participants stated time constraint and workload as the major inhibitors for not using WebCT. This finding concurs with the responses in the interviews with regard to PU. A number of participants in the interviews thought that time is needed to manage courses online in such a way that it is of optimal educational value. Many are of the view that it is top management's responsibility to set aside time for lecturers to learn and operate WebCT. Users need time to practice WebCT, in this way they may be able to establish whether WebCT is useful or not. The "Time constraint" factor could be explored for

future research once there is a considerable increase in WebCT awareness and knowledge in the faculty. The availability of time can lead to positive impacts on the other inhibitors; i.e. availability for training, a heightened positive attitude towards technology and confidence in using WebCT, which could lead to more time to practice and even an increase in computer competency.

**Attitude Towards computers:** In response to the survey questions regarding lecturer's attitude towards computers in general, most respondents agree that computers are important in today's society. The result of the survey shows that Attitude towards computers is statistically strongly correlated to PEOU. This implies that if lecturers have a positive attitude towards computers in general, they are more likely to find WebCT easy to use. This finding corroborates Chau's (2001) study that computer attitude positively affects both PU and PEOU, and Jawahar's (2001:321) finding that "attitude towards working with computers" was positively related to technology utilisation. This raises the question why WebCT adoption is so low in the faculty, if a positive attitude presupposes ease of use. This could imply that there is largely a negative attitude towards computers in general that influence the propensity of lecturers to use WebCT. In the interviews lecturers implied their disinterest in computers in general and trepidation in using WebCT specifically. The need for a "mind shift" was frequently expressed. The results show that Attitude towards computers has a moderately significant correlation with PU. A plausible explanation for this could be the observation of apathy with regard to lecturer's perceptions of new innovations; hence lecturer's limited knowledge and skepticim about the value of WebCT. The absence of a "buzz" in the faculty with regard to WebCT, could be the cause of the general disinterest. It is highly likely that if an individual does not like computers in general, a negative attitude may already prevent him/her from considering the usefulness of WebCT. This relates to the "no responses" in the interviews, which could be ascribed to their indifference to WebCT. They may view computers as a "necessary burden" in the workplace, but may feel embarrassed to verbalise it. In the interviews a few lecturers admitted that they have a mindset problem and "fear" computers and training sessions. Even though the "no responses" in the interviews were still relatively high, a number of lecturers feel positive about technology and how useful WebCT can potentially be to them.

**Computer Competency**: It was hypothesized that Computer competency positively impacts on PEOU and PU of WebCT. The majority of the respondents in both analyses indicate that they mostly agree that their perceived level of computer competency is adequate to learn and operate WebCT. The results of the survey found that there is a statistically strongly significant correlation between computer competency and PEOU but a moderately significant correlation to PU. The implication of this result, i.e. Computer competency is statistically strongly correlated to PEOU, is that the highly competent individuals who believe that they can learn and effectively use computer technology to enhance their performance are likely to outperform those with low levels of computer competency. The basic premise was that the higher the computer competence (that is perceived competence: the competency was not measured) the more likely the user would find it easy to use WebCT. This is consistent with findings by Igbaria and Iivari (cited in Chau, 2001), who found a statistically significant relationship between computer self-efficacy (the belief that one has the capability to perform a particular behaviour or skill) and PEOU and an insignificant effect on PU. In contrast, Chau, (2001) found a statistically insignificant relationship between computer self-efficacy and PEOU. A plausible explanation for the inconsistencies is the differences between the technology applications; the competencies required in various studies conducted are also varied. E.g. Chau's (2001) study was on a particular software package (Microsoft Word) while Igbaria and Iivari's study (1995), focus was on microcomputer use in general. In addition, the formulation of the survey questions is adapted to suit the particular technology under study. Computer competency was found to have a moderately significant correlation to PU of WebCT. In contrast, the majority of the participants in the interviews did not mention computer competency as an important factor for PU. The possible explanation for this could be that lecturers first need to find the WebCT easy to use and then after acquiring the skill, the value and functionalities of WebCT could be explored. Computer competency can also be influenced by the attitude that lecturers have towards computers, e.g. computer anxiety would inhibit the likelihood to find WebCT useful. The implication of the relationship of Computer competency and PU of WebCT in the faculty is of importance, because in the context of TAM, PU reflects a person's belief or expectations about outcomes. In the same way, computer competency refers to

an individual's perceptions of his or her ability to use computers in the accomplishment of a task. Compared to the other variables of PU, someone with a high level of computer competency is more likely to establish whether the technology is useful or not.

**Perceived Ease of Use (PEOU):** Diverse studies have established that Complexity and ineffectiveness of training (Cronje and Murdoch, 2001; Jawahar, 2002), Attitude towards computers and Computer competency (Chau, 2001;Jawahar and Elango, 2001) are antecedents to PEOU. Similarly, the majority of the responses in the survey suggest limited knowledge about the PEOU of WebCT, hence the high levels of "don't know". Findings indicate that the situational antecedent i.e. Complexity and ineffectiveness of training and the dispositional antecedents i.e. Attitude towards computers and Computer competency are statistically significant to PEOU. PEOU refers to the perception that the use of WebCT should be possible without much extra effort. From the interviews, some lecturers who are familiar with WebCT, view "effort" not necessarily as "difficult", but refer to other inhibiting factors that influence their perception of ease. "Effort" is also referred to because of the initial start-up phase in learning and understanding WebCT. Although WebCT is regarded as a timesaving technology, to start off initially is time-consuming. The user-friendliness (which has been defined in the literature similarly to PEOU) of WebCT, is one of the facilitating factors of WebCT use. A supplementary software programme, called Respondus must be used to design short answer and multiple-choice questions for assessment on WebCT. A few lecturers felt that Respondus is not user-friendly, which then creates the perception that WebCT is difficult to use. In addition, Respondus is not dealt with in training sessions. If lecturers have a negative Attitude towards computers in general, they are more likely to find WebCT difficult to use. "Mindset" and preference for the traditional face-to-face teaching method were identified as barriers to learning and understanding WebCT. The traditional way of teaching is known for it's educational value and also because it is perceived as "easier" and "familiar", as opposed to computer-based teaching methods, which are perceived as burdensome. Lecturers rated their Computer competency in terms of WebCT and other technology. Compared to other technology, they perceive their own skills and knowledge as limited to learn and understand WebCT. Because WebCT is web-based, it creates the impression of difficulty. The perception that WebCT is difficult to use can be addressed

by matching lecturer's skills to the training that is required. As previously discussed, training is the starting point to acquire the foundation knowledge and skills to learn and understand WebCT.

***Perceived Usefulness (PU):*** The majority of the respondents viewed PU of WebCT as more important to PEOU, since the overall mean responses for PU were between "Slightly likely" and "Quite Likely", compared to PEOU the overall mean were between "Don't know" and "Slightly likely". Compared to PEOU, PU is also more strongly correlated to WebCT utilisation statistically. This is consistent with two studies conducted by Davis (1989): PU had a significantly greater correlation with utilisation than did PEOU. However, the lecturers that are not entirely aware of the potential usefulness of WebCT are still prevalent. This is in agreement with the finding of Cronje and Murdoch (2001) that "lack of knowledge about technology" and "too little knowledge of WebCT to use it optimally" impacted on PU of WebCT. Situational variables, i.e. Complexity and ineffectiveness of training and Time constraint are not statistically significant antecedents of PU. However, in the interviews both were identified as having a significant impact on PU. The inconsistency of the survey finding and the interview results are interesting and further research is necessary to establish the importance of situational factors with regard to PU of WebCT in the faculty. Both dispositional variables, Attitude towards computers and Computer competency are moderately significant antecedents of PU, while the interview results only identified Attitude towards computers is an inhibiting factor to PU. However, antecedents that are moderately significant need further research because of the limited knowledge about WebCT that may have impacted on the perceptions of lecturers. With increased awareness about PU of WebCT, lecturers may develop the disposition to effect change. Future research might establish that with adequate knowledge about WebCT, the identified dispositional variables may be strongly significant to PU.

**WebCT Adoption:** PEOU and PU were found to be statistically significantly correlated to WebCT adoption. Even though the majority of the lecturers are not using WebCT, lecturers are more inclined to utilise WebCT if it is perceived as easy and useful. It was hypothesized that lecturers, who perceive WebCT as easy to use, will be more predisposed to adopt WebCT. This hypothesis has been found to be as statistically

significant: PEOU impacts positively on WebCT utilisation. This is in agreement with Gefen's (2003:108) findings that PEOU and PU do increase intentions for use, even though his study focused on the element of habit in user's behaviour intent to use a technology. The significance of PEOU to WebCT adoption in the faculty is of particular importance because the perception of difficulty could be addressed through training programmes, frequency of opportunity to practice, and in this way adoption may be increased. There is a statistically strong correlation between PU and WebCT utilisation. This finding is corroborated by Chau (2001) and prior studies, e.g. Davis (1989), Harris et al., (2001), etc., that PU is a strong variable to predict the actual usage of a technology. This suggests that lecturers would only use WebCT if it were perceived to be of any value and benefit to them, even if it is perceived as fairly difficult to learn and understand. Various studies have concluded that the perceived characteristics (PEOU and PU) had a direct effect on utilisation (Davis, 1989; Harris, 2001; Igbaria et al., 1999). In the alternative analysis, PEOU does not show statistical significance to WebCT utilisation. When the "don't know" is excluded, it reflects the lecturers that have knowledge of WebCT, but not all are active users. Harris et al (2001) found that self-report utilisation versus actual utilisation revealed that nearly 30% of the respondents who reported using the specified technology had no activity during the three-month period of analysis. In addition, the respondents reported higher utilisation compared to their actual utilisation. This is of particular importance because the actual utilisation of WebCT was not established in this study; findings were based on self-report utilisation. This suggests usage rates may be even lower than the low rates reported.

## 8. RECOMMENDATIONS

Following the previous section, the following recommendations are made: 1) WebCT training to be prioritized. Management at the departmental and faculty level, should be encouraged to allocate time for training that does not inflict on current workload of lecturers 2) Lecturers should be encouraged to acquire the appropriate skills to learn and implement WebCT. Small groups of lecturers could be identified to experiment with Web-based course development 3) Incentives. Potential adopters may become unwilling to sacrifice other incentives (e.g. financial incentives from research publications) to work

on technology integration in their courses. Compensation for time spent on designing and managing online courses is often not considered. Often lecturers resist a new innovation because it is viewed as extra work and therefore it will take extra effort to implement 4) Senior level management could ensure that WebCT is integrated in the course structures, making web course management an integral part of management education. Existing curricula could be complemented by Internet based projects. This could expedite adoption of WebCT since a number of lecturers are of the view that top management in the faculty does not actively drive WebCT 5) A dedicated specialist should drive WebCT in the faculty. The identified person should have close liaison with the e-learning department and should ensure that the procedures for quality assurance are upheld.

The e-learning department could consider the following suggestions: 1) Consideration should be given to the perceptions of lecturers toward Web course management and Web-based teaching and learning. Lecturers are confronted with large classes, organisational realignment, continuous assessment, the integration of WebCT and contact lectures, quality assurance, time constraints, etc. Lecturers need continuous support to effectively use WebCT. Training courses should be designed in such a way that perceived ease of use and perceived usefulness of WebCT from the perspectives of the lecturers are taken into account. Lecturers cannot realize the benefit from WebCT if it is too difficult to use. Even though its user-friendliness is an important factor for adoption, the value of WebCT as a course management system should be continuously emphasised 2) Close liaison with a dedicated WebCT specialist in the faculty.

## 9. LIMITATIONS OF THE RESEARCH

The findings of this research are not necessarily generalisable to the wider population of South African HEI's that have adopted WebCT. This research was conducted at one research site. The data collected reflects the specific organizational context and events at the Cape Peninsula University of Technology: Management Faculty. The institution is currently undergoing organisational realignment, which could be one of the reasons why WebCT is not presently actively marketed at the faculty under study. It would have been

an interesting extension of this study to investigate the diffusion of WebCT across the entire institution.

## 10. RECOMMENDATIONS FOR FURTHER RESEARCH

The technology acceptance and diffusion literature are well documented and tested in diverse studies. However, the following are recommended from shortcomings in the literature and in this particular study: 1) Although this study focused on the lecturers, it would be interesting to investigate the perceptions of learners from diverse backgrounds with regard to the integration of the Internet in teaching and learning at CPUT 2) This study could be generalized to other faculties at this institution since WebCT is also available to them 3) Concern about the academic quality of WCMSs. Further research is needed to investigate quality and security of assessments in web-based educational technologies at HEIs.

## 11. CONCULDING REMARKS

The introduction of Web-based learning in HEIs, its educational value and benefits is an ongoing debate. Whilst there is increase awareness of the technological development that must occur in HEIs in order to prepare students to compete internationally, there is also skepticism about the benefits of Web-based learning and the changes that the adoption of Web-technologies necessitate. In this study, the adoption or hesitation to adopt WebCT has been investigated. The majority of the lecturers are eager to learn and use WebCT and will more than likely embrace the adoption of WebCT if the barriers to use are not perceived as insurmountable. The researcher is of the view that there should be a deliberate intervention from management and heads of academic units to create a WebCT presence in the faculty. In this way, management's e-learning strategies could be intensified and a high quality web-course management system can be developed for the faculty.

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