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E-Learning and Task-Technology Fit: A Student and Instructor Comparison

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Abstract

Virtual Learning Environments (VLEs) are widespread in higher education today, typically used to deliver instructional materials and facilitate communication within a course. This study aimed to investigate the task-technology fit of VLEs for their two main groups of users: instructors and students, using the VLE WebCT. Task-technology fit, user satisfaction, attitude towards use and anticipated consequences of use were found to be significantly higher for students than for instructors. Instructors were found to have higher perceptions of social norms and higher perceptions of facilitating conditions than students. However, there was no difference between the instructors and students in level of utilisation of the VLE. Students perceived that the VLE had higher impacts on their learning compared with instructors' perceptions regarding their teaching. These results suggest that despite high levels of support acknowledged by instructors, they may still be unsure about the contribution of VLEs to their teaching.

Keywords

Task-technology fit, e-learning, virtual learning environment, user satisfaction, WebCT

INTRODUCTION

Information and communications technology has increasingly influenced higher education. From playing a supplementary role, it now has permeated core teaching and learning in universities and other organisations with training requirements. Remote delivery of courses became a viable option with the WWW and online education of various sorts is now routinely available to vast numbers of students (Alexander, 2001; Chen & Dwyer, 2003; Peffers & Bloom, 1999). Various terms have been used to label or describe forms of education supported by information technology. These include e-learning, web-based learning, online learning, distributed learning and technology-mediated learning; with e-learning probably the term most commonly used to describe education and training that networks such as the Internet support.

A virtual learning environment (VLE) is an information system that facilitates e-learning. VLEs process, store and disseminate educational material and support communication associated with teaching and learning. Despite the ubiquity of VLEs in education today, much of the evidence to support their use is anecdotal or of limited generalisability. In particular there has been very little research on use of VLEs by instructors, and how instructor use influences student learning. Many researchers have called for the lack of theoretically grounded and rigorous research to be addressed (Alavi & Leidner, 2001; Piccoli, Ahmad, & Ives, 2001). This paper addresses that call by considering the two main groups of users of VLEs students and instructors, and the tasks that VLEs support for these types of users. It compares the relative levels of task-technology fit and other precursors and related indicators of system success for the two main groups of users, with the aim of identifying any differences between them. Any such differences could have implications for the way in which effective use can be made of VLEs in higher education.

Background

Tasks are broadly defined as the actions carried out by individuals when turning inputs into outputs (Goodhue & Thompson, 1995). VLEs are designed to support students in their learning, and instructors in their teaching. Whilst these two tasks are closely related they differ in important ways, and may receive different types and

levels of support from VLEs. For example, student use of a VLE is primarily as an end user; they access and interact with the VLE. However, instructors may play dual roles. They play an end user development role in establishing a course within a VLE and then interact with it as a user. Instructors design the interface for their course and implement different levels of functionality (eg. interactive quizzes, calendars, chat rooms). The scope of the activities undertaken by the instructor in use of the VLE can be much broader and the tasks more complex. The levels of fit between the tasks students and instructors need to perform and the technology may differ.

Task-technology fit relates to the match between a user's task requirements, their abilities, and the functionality of the technology to support the task, and has been identified as an important contributor to the success of an information system (Goodhue & Thompson, 1995). Goodhue and Thompson (1995) proposed the technology-to-performance chain model to help end users and organizations understand and make more effective use of information technology. The technology-to-performance chain model combines insights from research on user attitudes as predictors of utilization and insights from research on task-technology fit as a predictor of performance. As can be seen from Figure 1 below, the model proposes that task characteristics, technology characteristics and individual characteristics determine task-technology fit. Task-technology fit in turn both directly influences performance, and indirectly influences utilization via precursors of utilization such as expected consequences of use, affect toward use, social norms, habit and facilitating conditions. Utilization is also proposed to directly influence performance.

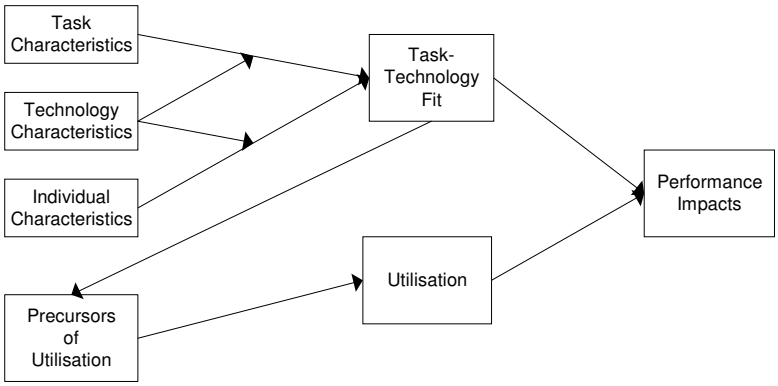

Figure 1: The technology-to-performance chain (Goodhue & Thompson, 1995)

There is some evidence to support aspects of the technology-to-performance chain in various domains. For example, Dishaw and Strong have researched the task-technology fit of computer aided software engineering (CASE) tools (Dishaw & Strong, 1998a; Dishaw & Strong, 1998b; Dishaw & Strong, 1999; Dishaw & Strong, 2003) and several groups have researched it in the health care domain (Lim & Benbasat, 2000; Pendharkar, Rodger, & Khosrow-Pour, 2001). There has, however, been little research on its application in the e-learning domain and no comparison of different types of users within the e-learning domain. It is possible, given the different roles of students and instructors in interacting with VLEs, that level of task-technology fit and other precursors of task success may differ between the two types of users. The project described in this paper explicitly examines this notion.

Satisfaction with an information system is commonly measured as an indicator of information systems success (Hwang & Thorn, 1999) and has been identified as a precursor of performance impacts in DeLone and McLean's (1992) model of IS success. Despite not being included in the technology-to-performance chain it is relevant to research on e-learning and is probably the most often considered outcome variable in e-learning research.

Other precursors of IS success of interest in this study are: expected consequences of use, attitude toward use, social norms, facilitating conditions and levels of use. Triandis (1971) introduced the role of expected consequences in influencing behaviour. Goodhue and Thompson (1995) argued that expected consequences of use should be influenced by the task-technology fit (i.e the better the task-technology fit the more positive anticipated consequences of use of a system) and that increased anticipated consequences of use should then lead to increased utilization of systems. Seddon (1997, p246) also included expectations about the consequences of future IS use in his test of DeLone and McLean's model of information systems success defining it as 'a valence-weighted sum of the decision-maker's expectations about the costs and benefit of future IS use'.

Attitude refers to the amount of affect one feels for or against some object or behaviour (Fishbein & Ajzen, 1975). Fishbein and Ajzen (1975) argue that attitudes towards objects do not strongly predict specific behaviors towards the objects, rather it is the attitude towards the specific behavior that determines whether the behavior is

performed. In the technology-to-performance chain attitude towards use of the system is proposed as a predictor of utilization (Goodhue & Thompson, 1995). Hence attitude towards use of VLEs, rather than attitude towards VLEs, is of interest in this study.

Social norm (also known as subjective norm) refers to the user's beliefs as to whether other individuals want them to perform the behaviour. The role of social norm in IS success has been investigated with mixed results. Staples and Seddon (2004) found that social norms influenced utilization when use was mandatory, and Venkatesh and Davis (2000) found that social norm influenced user acceptance. However, Dishaw and Strong (1999) found that social norms did not influence intention to use. This confusion might be explained by Karahanna, Straub, and Chervany's (1999) finding that social norm is important in determining initial adoption, but not in intention to continue.

Various conditions relating to support for system use (such as ease of access to the system, relationship of the user with support staff etc) could influence use and performance. This is reflected in DeLone and McLean's addition of service quality to their updated model of IS success (DeLone & McLean, 2003). Hence potential differences in perceptions of facilitating conditions are of interest in the study.

Utilization has been defined as 'the behavior of employing the technology in completing tasks' (Goodhue & Thompson, 1995, p218). Utilization of information systems has been measured in various ways including measures of frequency of current and anticipated use and diversity of application use. The technology-to-performance chain predicts that task-technology fit will lead to increased utilization (Goodhue & Thompson, 1995), but evidence has been mixed. For example, although Goodhue and Thompson (1995) found weak support for the relationship, Staples and Seddon (2004) found no relationship between utilization and performance.

Performance impact refers to the effect of the system on the behaviour of the user or the outcomes for the user. The impacts most commonly considered in information systems success research relate to management performance and decision making (DeLone & McLean, 1992), but in the e-learning domain, performance impact can relate to impacts on academic results or student perceptions of learning success, among others (Piccoli et al., 2001).

Related Research

The majority of research on perceptions and outcomes of e-learning has focused on students. Studies such as Piccoli, Ahmad, and Ives (2001) and Chou and Liu (2005) have compared classes taught using VLEs to traditional classes and considered outcomes such as satisfaction, self-efficacy and academic performance. The findings from these kinds of studies have been mixed. For example, Piccoli, Ahmad, and Ives (2001) found no significant differences in performance between students enrolled in the two environments, and participants in the VLE group reported being less satisfied with the learning process. Whereas in the Chou and Liu (2005) study, students in the VLE environment achieved better learning performance and higher levels of satisfaction.

Other research has explored the relationships between variables that may affect the success of e-learning. In a study of Internet-based MBA courses, Arbaugh (2000) found that perceived usefulness and perceived flexibility of the VLE were positively associated with student satisfaction with the course. However, perceived ease of use was not. Contrary to what might be expected based on the technology-to-performance chain or DeLone and McLean's (1992) model of IS success, level of VLE usage was not related to student satisfaction. Hayashi, Chen, Ryan, Wu (2004) investigated the role of computer self-efficacy in the e-learning context and found that it did not influence students' perceptions of the usefulness of VLEs or their satisfaction.

Newton (2003) has stressed the need to consider staff satisfaction and its role in student outcomes of e-learning, but there has been little research addressing this issue. Hartman, Dziuban and Moskal (2000) proposed that instructor satisfaction and student satisfaction co-vary when predicting success of e-learning and argue that student and instructor perceptions and outcomes should not be considered independently. Similarly, Pajo and Wallace (2001) argued that the successful integration of technology into teaching depends not only on access and availability of technology but also on how instructors accept it and use it. They categorised barriers to instructor acceptance and use as personal (such as time and effort required), attitudinal (affective reactions) and organisational (such as support and encouragement) and found that personal and attitudinal barriers were more important than organisational barriers. In a survey of 250 academics, Pajo and Wallace (2001) found that the time required to learn how to use the technology was the most significant factor inhibiting use. Newton's (2003) participants also found it an important issue. Lack of training and continuing time requirements have also been identified as significant barriers to use (Pajo & Wallace, 2001). However, as Newton (2003) notes, provision of training alone does not address the problems: ensuring that staff have time to avail themselves of it is essential. This is consistent with Lee's (2001) finding that academic staff motivation and commitment were higher in institutions that provide a higher and broader levels of support.

There has been very little research that compares the experiences and perceptions of students and instructors who use VLEs. Webster and Hackney (1997) noted the importance of instructor style in achieving student participation and involvement. They found that if instructors have positive attitudes toward technology in teaching, students will be more likely to do so. However, it should be noted that their measurements of instructor attitudes were based on student perceptions.

RESEARCH QUESTIONS

The research described in this paper is designed to compare use and perceptions of VLEs by students and instructors in order to address the lack of e-learning research that considers both students and instructors. The first research question investigated in this study was:

> Do students and instructors differ with respect to perceptions of the level of task-technology fit of VLEs?

Zigurs and Buckland (1998) identified task complexity as an important dimension of task-technology fit and called for further research on the dimensions of task-technology fit. As described above, the type of tasks that students use VLEs for are more straightforward than those undertaken by instructors. Instructors must both develop a course within a VLE and then use it whilst the course is being taken by students. Thus task complexity is greater for instructors and task-technology fit may be harder to achieve. Therefore it was hypothesised that students will perceive the task-technology fit of a VLE to be better than will instructors.

H1: Task-technology fit will be higher for students than for instructors.

As other factors have been proposed to play a role in the performance impact of information systems, it was also considered to be important to compare their levels between students and instructors. The second research question was therefore:

> Do students and instructors differ with respect to other factors believed to influence the performance impact of VLEs?

User satisfaction has been widely studied, both as a precursor of performance impacts (e.g. DeLone & McLean, 1992; DeLone & McLean, 2003; Seddon & Kiew, 1996) and as a surrogate for performance impacts (e.g. Gatian, 1994; Khalil & Elkordy, 1999; Lin & Shao, 2000). Blili, Raymond and Rivard (1998) found a weak negative relationship between task complexity and end user satisfaction and Gelderman (2002) identified a negative relationship between task difficulty and satisfaction. Therefore it was hypothesised that:

H2: User satisfaction will be higher for students than for instructors.

Similarly it was anticipated that both expected consequences of use and attitudes towards use would be more positive for students than for instructors. Students tend to be younger than instructors and there is substantial anecdotal evidence that supports their comfort with technology (Hagner, 2001)(other refs?) In addition, previous research linking higher levels of task-technology fit to more positive perceptions of consequences of use and attitude towards use (Staples & Seddon, 2004) makes the following hypotheses consistent with what is proposed in H1:

H3: Attitude towards use will be more positive for students than for instructors.

H4: Expected consequences of use will be more positive for students than for instructors.

Given the premise that students (particularly younger ones) have grown up with information technology it seems likely that students will perceive lower levels of social expectation towards technology use. It is such an integral part of their lives that they are less likely to be subject to social influences. Much of the initial e-learning introduction was driven by early adopters who were technology champions, however there is evidence to suggest that many instructors are reluctant to adopt VLEs (Gupta, White, & Walmsley, 2004) yet may feel pressure from their institutions. Therefore it was hypothesised that:

H5: Instructors will perceive higher levels of social norms than do students

Organisations are actively promoting use of VLEs to all stakeholders, so whilst facilitating conditions have been shown to influence IS success, there is no reason to expect differences between students and instructors. It was therefore hypothesised that:

H6: There will be no difference in the levels of facilitating conditions between student and instructors.

Given the dual role of instructors and the reports of heavy time commitments required (Hirscheim, 2005; Newton, 2003), it was anticipated that VLE use would require more time commitment from instructors than from students. It was therefore hypothesised that:

H7: Instructors will use VLEs more than students do.

The primary justifications for e-learning and adoption of VLEs have focussed on student learning (Hirscheim, 2005) and organizational efficiency (Hiltz & Turoff, 2005). There has been very little discussion about, or research on, their impacts on the work of instructors. Therefore the final research question investigated in this study was:

Do the performance impacts of VLEs differ between instructors and students?

Given the proposed higher levels of precursors to success anticipated for students and the focus on student learning as the major target of VLEs, it appears likely that greater impacts will be perceived by students than by instructors. Therefore, the following hypothesis was proposed:

H8: Students will perceive greater impact from VLE use than will instructors.

METHOD

This study was designed to directly compare use of and perceptions of VLEs by students and instructors. WebCT is one of the most commonly used VLEs (Yip, 2004) and was the VLE considered in this study.

Participants

The sample for this study consisted of two groups from an Australian university: students who were using WebCT in their studies, and instructors who were using WebCT in their teaching.

Procedure

Students enrolled in 17 different undergraduate degrees were targeted to give a broad range of both levels of use and pedagogies. Instructors who had been added to an email list because they were users of WebCT provided the pool for instructor participants. Participants were initially contacted via email and invited to participate in the study by clicking on a link to complete a questionnaire on the web. The questionnaire took approximately 10 minutes to complete. Completion of the questionnaire was voluntary and all responses anonymous.

The Questionnaire

Items to measure the constructs of interest were developed for the e-learning domain using instruments from previous research on the technology-to-performance chain as a starting point (e.g. Goodhue & Thompson, 1995; Hartwick & Barki, 1994; Staples & Seddon, 2004), with new items being developed as needed.

The questionnaire consisted of two main sections. The first section asked questions about the participants and their previous training and experience with computers, the Internet and WebCT. The second section asked questions about the participants' perceptions of WebCT, their satisfaction with it, and its role in their academic or teaching success. The student and instructor versions of the questionnaire were kept as consistent as possible, and differed primarily in terms of the task that was referred to, that is, teaching or learning. The constructs measured in the second section of the questionnaire are described below.

Task-technology fit was measured with a multi-faceted measure as was done in Staples and Seddon (2004). The aspects of task-technology fit considered (and the source of items used to measure them) were work compatibility (two items from Moore and Benbasat (1991)), ease of use (three items from Doll and Torkzadeh (1988)), ease of learning (three items from Staples and Seddon (2004)), and information quality (5 items from Doll and Torkzadeh (1988)). The 13 items were measured on a 7 point Likert scale labelled from 'strongly disagree' to 'strongly agree'. An overall task-technology fit score was calculated as the sum of the 13 items.

User satisfaction was measured using 3 items from Seddon and Kiew (1996). The items were measured on a 7 point Likert scale labelled from 'strongly disagree' to 'strongly agree'. An overall user satisfaction score was calculated as the sum of the 3 items.

Attitude to using WebCT was measured using 4 items. The items are based on items from Hartwick and Barki (1994), Taylor (1995) and Davis, Bagozzi, and Warshaw (1989) and use 5 point semantic differential scales. An overall Attitude to using WebCT score was calculated as the sum of the 4 items.

Expected consequences of use was measured using 8 of the 10 items used by Staples and Seddon (2004). These items were developed initially by Davis (1989) and Moore and Benbasat (1991). The items were measured on a 7 point Likert scale labelled from 'strongly disagree' to 'strongly agree'. An overall expected consequences of use score was calculated as the sum of the 4 items.

Social norm was measured using 4 items from Hartwick and Barki (1994). The items were measured on a 7 point Likert scale labelled from 'strongly disagree' to 'strongly agree'. An overall social norm score was calculated as the sum of the 4 items.

Facilitating conditions was measured using 5 items. The items are based on items from Baroudi and Orlikowski (1988), Thompson, Higgins and Howell (1994) and Taylor and Todd (1995). The items were measured on a 7 point Likert scale labelled from 'strongly disagree' to 'strongly agree'. An overall facilitating conditions score was calculated as the sum of the 5 items.

Utilization was measured by asking participants how many hours a week they used WebCT.

Performance impact was measured using 3 items from Goodhue and Thompson (1995). The items were measured on a 7 point Likert scale labelled from 'strongly disagree' to 'strongly agree'. An overall performance impact score was calculated as the sum of the 3 items.

RESULTS AND DISCUSSION

A total of 334 people participated in the study. The student group had 267 people (73.7% females and 26.3% males) and the instructor group consisted of 67 people (42.2% females and 57.8% males). Student ages ranged from a minimum of 17 to a maximum of 59 (with an average age of 28 years) and instructor ages ranged from a minimum of 25 to a maximum of 65 (with an average of 46 years). Whilst being essentially a convenience sample, the participants covered a broad spectrum of ages, levels of usage of WebCT and levels of IT experience and training. Table 1 below provides a summary of the background of the participants.

	Students			Instructors			
	N	*Mean*	*Std. dev.*	*N*	*Mean*	*Std. dev*	*Sign.*
Age	269	28.01	9.98	65	46.12	8.61	0.000
Years of computer experience	265	11.84	4.79	67	19.78	6.72	0.000
Years of Internet experience	266	7.08	2.87	67	11.46	3.56	0.000
Perceived IT skill	269	5.25	1.20	67	5.58	1.22	0.044

Table 1: The participants

Table 2 below provides descriptive information about each of the variables of interest for the research questions.. Each of the hypotheses was addressed by comparing student perceptions with instructor perceptions using independent-samples t-tests. The results are also shown in Table 2.

	Students			Instructors			
	N	*Mean*	*Std. dev.*	*N*	*Mean*	*Std. dev*	*Sign.*
Task-technology fit (H1)	269	69.37	13.93	67	55.07	16.08	0.000
User satisfaction (H2)	269	16.26	4.25	67	13.96	4.27	0.000
Attitude towards using (H3)	268	22.52	5.04	67	19.19	5.34	0.001
Anticipated consequences of use (H4)	269	40.81	10.86	67	35.00	12.20	0.000
Social norms (H5)	267	15.85	4.94	67	20.01	4.08	0.000
Facilitating conditions (H6)	269	23.41	6.15	67	27.06	5.13	0.000
Utilization (H7)	268	4.71	3.45	66	3.84	3.45	0.217
Impact (H8)	269	15.55	4.30	67	13.58	4.61	0.001

Table 2: Comparison of student and instructor perceptions

Task-technology fit

As can be seen from Table 2, task-technology fit was significantly higher for students than for instructors (69.37 versus 55.07, t(334)=7.28, p=0.000). Therefore, H1 was supported. Students considered the VLE to have a better

task-technology fit for their activities than did the instructors. Three dimensions of task-technology fit were considered in the study: work compatibility, ease of use, ease of learning and information quality. Post hoc analysis was conducted to determine which of these dimensions differed between students and instructors. All dimensions were found to be significantly higher in the student group, that is, students believed that the VLE had significantly greater work compatibility for their tasks (10.29 versus 9.42, t(333)=2.09, p=0.038), that it was easier to use (16.50 versus 12.06, t(333)=7.51, p=0.000) and easier to learn (16.79 versus 12.43, t(328)=8.15, p=0.000) and that it provided them with information of better quality (26.09 versus 23.69, t(318)=3.18, p=0.002).

The technology-to-performance chain proposes that task-technology fit is determined by task characteristics, technology characteristics, and individual characteristics (Goodhue & Thompson, 1995). The differences between student and instructor perceptions of task-technology fit are likely to be determined by differences in one or more of these factors. As has previously been discussed, student and instructor tasks differ and the interaction with the system required by instructors to complete their tasks is more complex than that required of students. Therefore it seems likely that the VLE considered in this study does not cater for this complexity as well as it might, that is, the technology characteristics are more compatible with the student tasks than with instructor tasks. It is also possible that individual characteristics such as age, previous experience and training are influencing task-technology fit. The instructor group was significantly older than the student group (46.12 versus 28.01; t(332)=-13.47, p=0.000) and there has been some evidence to suggest that age is associated with anxiety and confidence of users (Knight & Pearson, 2005). However, as can be seem from Table 1, instructors had significantly more years of both computing and Internet experience than did the student group. The proportions of students and instructors who had taken a formal IT skills course were not significantly different (64.7% versus 65.7%, $\chi 2$=0.023, p=0.880). So it seems unlikely that individual characteristics are the major determinant of the task-technology fit differences.

Other factors that may influence the performance impact of VLEs

User satisfaction. User satisfaction was also significantly higher for students than for instructors (16.26 versus 13.96, t(16.26 versus 13.96, t(334)=3.96, p=0.000) as hypothesised. Thus H2 was supported. This result is consistent with the negative relationships identified between task complexity (and difficulty) and user satisfaction in previous research (Blili et al., 1998; Gelderman, 2002). Hartman, Dziuban and Moskal (2000) concluded that instructor satisfaction is both a dependent and independent variable in e-learning and highlighted the importance of the relationship between faculty satisfaction and student outcomes. The results of this study suggest that the relationship between student and instructor outcomes should be explored further, and that educational institutions should take action to address the satisfaction of instructors with the VLEs available to them.

Attitude towards using. Levels of attitude towards use were also significantly higher for students than for instructors (22.52 versus 19.19, t(333)=4.78, p=0.000) as were levels of *anticipated consequences of use* (40.81 vs 35.00, t(334)=3.82, p=0.000). Therefore H3 and H4 were supported. These results are consistent with the raised levels of task-technology fit for students, as task-technology fit is proposed to influence attitude towards use anticipated consequences of use (Goodhue & Thompson, 1995).

Social norms. It was hypothesised that instructors would be subject to higher levels of social norms than students, on the premise that information technology is such an integral part of the lives of students that its use is taken for granted, not subject to social pressures. Hypothesis (H5) was supported, with instructors having significantly higher perceptions of social norms than did students (20.01 vs 15.85, t(332)=-6.374, p=0.000). Instructors are apparently very conscious of pressures from the institution and from their colleagues to use VLEs.

Facilitating conditions. The perceptions of levels of facilitating conditions between students and instructors were compared, and contrary to expectations there was a significant difference with instructors perceiving higher levels of facilitating conditions (27.06 versus 23.41, t(317)=-4.39, p=0.000). H6 was therefore rejected. Several authors have commented on the importance of support in ensuring the success of e-learning, and commented particularly on the lack of support often available to instructors (James & Beatties, 1996; Newton, 2003). The results of this study indicate that in the environment investigated facilitating conditions do not appear to be a major issue as perceived levels of facilitating conditions were generally high. However, as has been noted in previous research, organisational provision of training and support is not sufficient, instructors must have sufficient time available to make use of the support provided (Newton, 2003; Pajo & Wallace, 2001).

Utilization. H7 related to levels of use of the VLE. It was hypothesised the instructors would spend more time using the VLE than would students. However, this was not the case as there was no significant difference in levels of usage between the groups (t(331)=1.237). H7 was therefore rejected. There was however, a large variation in the amounts of time spent within the groups. The maximum time spent by any of the students was 48

hours a week with a minimum of zero hours (average = 4.7 hours), The maximum time spent by any instructor was 15 hours with a minimum, of zero hours (average of 3.8 hours). This result is not consistent with reports that many staff using VLEs find it difficult to control the proportion of time devoted to teaching duties (James & Beatties, 1996). It may be that as VLE use becomes mainstream, instructors are adapting and finding ways to more effectively manage time commitment.

Performance impacts

The final research question and hypothesis related to the performance impacts of the VLE. Students were asked about its impacts on their learning and instructors were asked with respect to their teaching. The results showed that students perceived significantly higher impacts than did instructors (15.55 versus 13.58, t(334)=3.31, p=0.01). H8 was therefore supported.

The results of this study raise concerns that if instructor perceptions of VLEs are neglected and that student task-technology fit is seen as the major target of VLE, there may inadvertently be impacts on instructor use, and via these, negative influences on student learning. This possibility is highlighted by a number of comments received from student participants. For example:

> '*I have recently completed the WebCT survey and noted one important point which was not brought up that maybe important to your study. I find that the program WebCT itself is excellent but its usefulness is greatly determined by the unit coordinator. If the unit coordinator does not know how to effectively use WebCT (as is often the case) then the information provided to students is limited……I think the most important improvement that could be made to WebCT is educating the unit coordinators how to use the program.*'

CONCLUSION

In conclusion, Pajo and Wallace (2001) stressed that the successful integration of technology into teaching depends not only on access and availability of technology but also on how teachers embrace and use it. The current study found that while instructors perceived that they had high levels of support in their use of the VLE, they were nevertheless less satisfied, and did not perceive that it supported their teaching activities as well as the student believed it supported their learning activities. This gap should be addressed, and further research should investigate the role of task-technology fit in doing so.

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