Relationship virtual learning environment and student learning experience: What are the mediating variables?

Raphaël K. Akamavi[1], Adele M. Butterfield[2], Gelareh Roushan[3] and Elsayed Mohamed[3].

1. The University of Hull, Business School, UK
2. Business Analyst/ Project Manager at iBlocks
3. The University of Bournemouth, Business School, UK
4. The University of Tanta, Business College, Egypt

Abstract

Virtual Learning Environment (VLE) tools as a web based digital technology and software facilitate teaching activities and student learning experience. It is increasingly becoming an innovative way of learning and an essential part of courses in the Higher Education sector. Although the speedy explosion and increased recognition of virtual learning, little is known how VLE diffusion rate and innovative attributes affect module delivery and student learning experience through the mediating role of virtual collaboration. Using an usable response of 209 university students from the online self-administered survey, our results indicates that there are direct and indirect significant relationships between innovative attributes, module virtual collaboration and learning experience. As a result, lecturers should actively encourage and support students to virtually collaborate with each other around key issues related to VLE in order to enhance their learning experience. The senior management teams of the university should equip academic and support staff with VLE for being able to fully use VLE its full capacity.

Introduction

Virtual Learning Environments (VLEs) are web based pieces of software, which provides various internet learning tools (Heaton-Shrestha et al, 2005). The globalization of education is supported by an increasing use of e-learning through VLEs which helps cross borders of time and place (Raaij and Schepers, 2008). VLEs are increasingly becoming a vital part of teaching and learning (Pituch and Lee, 2006). Harris et al, (2001) predicts that online courses provided by universities will increase substantially. Currently over 95% of higher education institutions in the UK use one or more Virtual Learning Environment (Browne, Jenkins, and Walker, 2006).

The virtual platform allows for automatic enrolment of students, grading of tests and notification of grades to students (Kuutti, 1996). It provides students with 24hr access to course material and different opportunities for teachers and students to interact (Monger and Weaver, 2002). Furthermore, it provides management of teaching materials and both synchronous and asynchronous communication through instant messaging, chat rooms, bulletin boards and emails (Dalziel, 2003). There are numerous types of VLES's such as Blackboard, Moodle, Sakai, Reload and WebCT (re.Appendix1). The VLES allows the teacher to monitor students learning and provides the ability to write sequences between learning tasks (Lonn and Teasley, 2009). The templates, guidelines and rules have helped lecturers improve their skills and thus teaching (Christensen et al, 2002). A number of Early Adopters started to experiment with e-learning solutions in the 80's, however they were restricted in their deployment and haven't yet been seen to have a significant impact in changing the way in which teaching is carried out (Blin and Munro, 2008). This study aims to investigate the Perceived Innovative Attributes (PIA) of students in terms of the VLE and the affect they have on the Rate of Diffusion.

It is not necessarily the tool provided by VLEs, but how these tools are used to help students and teachers achieve their desired course goals (Holm, Röllinghoff, and Ninck, 2003). Monger and Waever (2002) reveal that internet learning tools permit various groups such as students to teacher, and students to students to virtually communicate and support each others. Martins and Kellermans (2004) share a similar view point. They point out that VLEs allows efficient communication between students and their teachers as well as among themselves. However VLEs face critique as it is believed the lack of face-to-face interaction reduces the effectiveness of instructions of certain learning styles (Bullen, 1998; Terrell and Dringus, 2000; Ward and Newlands, 1998). Also the learning achieved through discussions or overheard during class that occurs in face-to-face environment cannot be replaced by VLEs (Sanders, 2006). On the contrary Duan, (2010) believes collaboration is improved through the use of features on the VLEs. This has led to the increasing rapid rate of e-learning (which utilises VLEs) among higher education (Liao and Lu, 2008). Douglas and Der Vyver, (2004) believes e-learning provides a suitable alternative to traditional face-to-face teaching and learning. Compared to face-to-face teaching, e-learning can be seen as an innovative way of learning, it is therefore not well understood (Duan, 2010). This study therefore aims to gain an understanding into Module Delivery which involves collaboration and the Learning Experience gained through the use of VLEs, a key aspect to e-learning.

Theoretical background

The diffusion of innovation is an interesting area of research. One of the leading people in this field is Rogers, (2003; 2005) who outlines the diffusion of innovation theory. Lu, Quan and Cao (2009)

explore the diffusion of innovation gap in WIFI among university staff, using Rogers's theory as a framework. Lu, et al (2003) suggest further research should be extended to other instructional technology such as email, e-portfolio. Although E-learning can be different in terms of actual delivery such as platforms, technologies and applications the main characteristic remains the same, minimum use of face-to-face lecturers, flexibility from accessing learning materials at any moment in time along with self paced learning (Duan, 2010). VLEs can be considered to be one of the main methods of delivering an e-learning program. (Liao and Lu, 2008) used Rogers DOI model to look at the use of an e-learning website, the results cannot go further than the sample and use of a website. This provides scope for VLEs to be considered, looking at perceptions of the adopters and the impact of the rate of diffusion. As such an investigation into the PIA as outlined by (Rogers, 2003) and the extent this affects the Diffusion Rate of the VLES (Rogers, 2003) is examined in this study.

The adoption rate of VLEs has been rapid however little is known about the benefit these systems have on Learning Experience (Koszalka & Ganesan, 2004). The pedagogical benefit of using new technology into delivering subject material is not well understood due to its pace of change (Wells et al, 2008, Reeves, 1997; Bonner, 1999; Smeaton and Keogh, 1999; Brace-Govan and Clulow, 2000). However some studies have found that improved learning outcomes result from heightened motivation and extended mental effort (Kozma, 1991; Kember, 1995; Koh and Koh, 1999; Bryant and Hunton, 2000). Ramsey (2003) finds that the impact and use of technology on learning outcomes isn't fully understood. To gain an understanding provides the motivation of this study. Through investigating how lecturers/students use VLEs and the extent to which Module Delivery quality is improved through using this medium.

Various studies have found that traditional content such as power point presentations tend to be used (Fletcher and Dodds, 2002; Xu et al, 2005; Steel and Hudson, 2001; Punie, 2007). Rather than a student centred constructivist approach involving the use of advanced collaborative features such as Forums (Peacock and Hooper, 2007; Topper, 2003; Hughes and Daykin, 2002; Blin and Munro, 2008; Wells et al, 2008), Wikis (Lundin, 2008; Kear et al, 2010; Yiu and Eugenia, 2010; Lundin, 2008), and video or audio (Kuutti, 1996; Heaton-Shreatha et al, 2005). This highlights the need to examine the extent to which Module Delivery quality has been improved through the use of VLEs. (DuFrene et al, 2009) investigated into technology mediated learning aids that address the learning styles of the students. In a similar fashion this study will investigate the students preferred method of learning and how this effects the features they use on the VLE.

It was a difficult time to get results from students due to a vast amount of students on holiday, doing dissertations or resists when the research was carried out. Graduated students are likely to have jobs, families and other pressing commitments. It was decided in order to get the greatest response rate to have the sample population as past and present University students that have used a VLE. It would be

impracticable to survey the entire population due to budget, time constraints and availability (Saunders et al, 2012). The sample frame was taken from the population and a mixed set of techniques were used to gain the sample. The main concern was to raise awareness of the questionnaire through as many possible avenues, to increase the chances of it being filled out. As a large sample size, increases precision through decreasing the sampling error (Bryman and Bell, 2015).

Methodology

A cross sectional study has been carried out this was used due to time constraints on the project (Easterby-Smith et al, 2012; Robson, 2002). A triangulation method was used building on qualitative and qualitative data collected from a survey carried out by the e-Bridge team to help guide the questions to be asked in the questionnaire for this study.

In addition, a review of the literature was carried out to see how best to represent the constructs in the questionnaire. For each concept at least 10 questions were asked relating to it, in order to overcome any misclassification problems and to look more in depth rather than using just one question (Bryman and Bell, 2015). Following the studies by Lonn and Teasley (2009); Wells et al, (2008); Green et al, (2006) and Duan et al, (2010) a 5 point Likert scale was used for all the questions in the four constructs: Learning Experience, Module Delivery, Diffusion Rate category and level of perceived innovative attributes. This was done to provide consistency, reduce confusion and ultimately make the statements easier to understand and answer (Dillman, 2007). Following the measures used in previous studies and fieldwork statements, the items were anchored with a five point Likert scale where 1 = strongly agree and 5 = strongly disagree.

The questionnaire was piloted by two experts in the field and a purposive sampling of 30 people that appeared on Facebook chat, who went to University and were from a selection of different disciplines were asked to fill out the questionnaire and provide feedback. Purposive heterogeneous sampling was used to ensure the most informative individuals were selected (Saunders et al, 2012). A small sample of different cases can enable patterns to emerge and represent key themes (Patton, 2002). The piloted data was put through SSPS, the information was limited however relationships where present, along with reliability and validity being strong. A valid questionnaire will enable accurate data collection consistently; ensuring questions are understood by the respondents as they are intended by the researcher (Foddy, 1994). From the feedback given the questionnaire was updated with reworded questions, and progress bar to increase the accuracy and response rate. The main questionnaire was rolled out on the 5th of August and ran for 3 weeks.

Results and discussion

There was a strong positive relationship between Learning and Collaboration (r=.57, p<.001). The coefficient of determination shows that these two variables account for 32% of the shared variance. This confirms the results of Yiu and Eugenia (2010) who found wiki-based activities enabling collaboration plays a significant role in learning. Also Janes (2006) found that by ensuring collaboration between students and students with teachers promoted a deep approach to learning and a positive student experience. Along with (Marks et al, 2005; Abdous and Yen, 2010; Pieter, 2003) that found collaboration positively facilitates learning. Also Roberts et al (2010) found VLEs can provide a social space community which participates in the Learning Experience. It does however contradict the findings of Swan (2010) where collaboration features were negatively associated with student learning.

A strong relationship was found between the two variables Module Delivery and PIA (Relative Advantage and Compatibility) (r=.51, p<.001). This supports the findings of Love and Fry (2006). A moderate relationship between learning and PIA was found (r=.46, p<.001). This supports the findings of Liao and Lu (2008). Also collaboration and PIA have a moderate relationship (r=.48, p<001). This supports the findings of Abdous and Yen (2010). These variables were found to account for 26%, 21% and 23% of the shared variance respectively. It can therefore be assumed that PIA has a relationship with learning and collaboration. It is likely that depending on the students perceived ideas about VLEs affects their use of collaboration tools and Learning Experience as a whole.

A moderate positive relationship was found between PIA and the Diffusion Rate Early Adopters (r=.49, p<.001). The relationship between PIA (Relative Advantage and Compatibility) and Perceived Usefulness (Complexity and Observability) has a strong positive relationship (r=.52, p<.001). This supports the research of (Rogers, 2003; Lee et al, 2009; Lu et al, 2009; Duan et al, 2010) that PIA of compatibility and ease of use (Complexity) has a positive affect on the Diffusion Rate of the adoption of an innovation.

Module Delivery and Learning Experience were found to have a moderate relationship (r=.37, p<.001). Also Module Delivery and collaboration have a moderate relationship (r=.39, p<.001). These account for 14% and 15% of the shared variance respectively. This indicated that the way in which lecturer delivery the modules has a relationship with the Learning Experience of the students, also the Module Delivery has a relationship with collaboration that takes place on VLEs. This supports Kember et al (2010) who found that Teaching approaches has an effect on learning approaches, which has an effect on learning outcomes. Also Peacock and Hooper (2007) found tutor participation motivated students to participate in the online discussions, as students needed to know discussion were being kept on track.

The relationship between Collaboration and Perceived Usefulness was a positive moderate relationship (r= .42, p<.001). This supports the findings of Abdous and Yen (2010). Also the Perceived Usefulness has a moderate relationship with Learning Experience (r= .31, p<.001). Which supports the findings of (Green et al, 2006; Duferene et al, 2009; Selim, 2003; Lee et al, 2002). The relationship between Early Adopter and collaboration was moderate (r= .36, p<.001). These account for 18%, 10% and 13% of the shared variance respectively. Also the Perceived Usefulness and the Early Adopter was moderate (r= .30, p<.001), supporting the findings of Rogers (1995). Along with Early Adopter and Module Delivery (r= .30, p<.001). These account for 9% of the shared variance respectively.

Implications and potential future studies

What has come out of this study is that collaboration has a very high positive significant effect on the Learning Experience of students. With this in mind lecturers should actively encourage and support students to collaborate with each other around key issues related to the module to enhance the Learning Experience of the students. This can be done through promoting discussions in forums, continuing tutorial discussions, or discussions of hot topics, for example in the forums. Lecturers need to participate and to guide discussions as this motivates the student to participate in the discussions knowing they are being kept on track as outlined by Peacock and Hooper (2007). As a student talking to fellow students over how to approach assignments can be very insightful and provide direction. Lectures at a minimum need to provide access to past exam papers/assignment papers and lecture notes. But they should also ensure they fully utilise the facilities on the VLES such as test and quizzes along with collaboration tools such as e-mail, Wikis and Forums to enhance Learning Experience of students. Also the study found that the calendar features would be useful if used by their lecturers, however there is a significant difference between undergraduates and post gradates over this.

This study was carried out for VLEs that have been used at one University, the extent to which these findings are generlisable to other universities cannot be directly inferred (Arbaugh and Bebunan-Fich, 2006; Martins and Kellermanns, 2004). Hence, further studies should consider numerous national universities to explore this phenomenon.

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