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## Learning on the move business students' adaptation of virtual learning environment and mobile device technology

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### ABSTRACT

Love and Fry's research study observed that tutors were underutilizing Blackboard as a repository for core materials. At the time of that research, most students accessed Virtual Learning Environments (VLEs) via personal computers. Zainuddin, Idrus, & Jamal posited that VLEs such as Moodle continue to be underutilized as repositories. The literature indicates that the use of mobile technologies to access VLEs trended upward from 2012 onward. We wanted to revisit the results of a 2012 survey administered to 83 undergraduate students studying business at the University of Greenwich. Our analysis explored whether the rise of mobile technologies impacted student interaction with Moodle. Chi-square analysis showed participants' responses to accessing textbooks as an effective way to revise via mobile devices were associated with whether they believed their use of mobile devices would increase over the next three years  $\chi^2(3) = 7.80$ ,  $p < .05$ . Chi-square analysis also showed association between accessing textbooks as an effective way to revise and frequency of accessing the VLE, Moodle  $\chi^2(4) = 13.04$ ,  $p < .01$ . The rise of mobile learning devices did not radically alter VLE utilization among this sample. Implications for higher education as a whole are discussed.

### 1. Introduction

Love and Fry (2006) published research on the widely debated topic that Virtual Learning Environments (VLEs) are underutilized as a learning tool. They state that students used "... the VLE as a 'safety net' that either provides them with core material to fall back on when failing to attend taught sessions or acts as a communication tool for tutors" (p. 157). The Love and Fry study used a lot of loaded terminology and argued that VLEs as a "'safety net' can have a positive 'housekeeping' impact for both students and tutors" (p. 158). The study concluded, "The online provision of teaching material does not motivate students to either attend taught sessions or use the VLE to engage in an independent and deep approach to learning" (p. 161). Love and Fry suggest that there is a disconnect between postings on a VLE and taught sessions, and they go as far to provide findings which indicate that students become disenfranchised with the VLE as the academic year progresses.

In a follow-up study, Fry and Love (2011) reiterated that lecturers mostly use VLEs to "disseminate information" and facilitate "programme management" and that lecturers feared the VLEs might replace them as academic experts (p. 51). This research emerged around the time mobile learning technologies such as iPhones, iPads, and tablets started to increasingly impact how students accessed VLEs. Hernández and Pérez (2014) reported the results of a 2012 data mining study that suggested 25% of students were accessing VLEs via mobile technologies, and of that sample, 75% had used the devices for learning purposes. Hernández and Pérez concluded that mobile learning technologies could help solve pedagogical issues in higher education.

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It is posited here that mobile technologies enhance and inhibit student engagement with VLEs in ways that were unimaginable with Personal Computers (PCs) a decade earlier. The speed of communication on social networks via mobile devices has proliferated online debate and social interaction with peers that carry over to VLE blogposts and discussion groups in ways that were not possible with PCs. Innovative disruptions to learning have also emerged. For instance, one of the researchers in this study encountered a situation where an unidentified student or group of students were using an Android application to switch off the projector mid-lecture. The researcher managed to outsmart the perpetrators by using shipping tape around the projector to block the application's signal. The problem thus resolved and the researcher was able to redirect the students' attention to the learning materials located on the VLE. This serves as an example of how disruptive students have been enabled by mobile technologies to produce distractions that were once unachievable in the era of PCs.

It is believed that tech savvy lecturers who adapted to VLEs early-on should have seized upon new mobile technologies to produce active learning outcomes while minimizing distractions by staying one step ahead of potential class disrupters. This paper revisits historical data collected in 2012, and in particular, explores whether new mobile technology at that time impacted the student perception of VLEs. It is important to note that Fry and Love's initial research used Blackboard when exploring the VLE element of online learning. Blackboard mostly uses proprietary sources for coding learning management systems with the exception of its acquisition of Moodlerooms and NetSpot (Quillen, 2012, pp. 32–34). Moodle provides free open source coding for VLEs. Quillen (2012, pp. 32–34) argues, "... Moodle users have often been early-adopting, tech-savvy teachers looking for a more affordable way to manage content within their own classrooms and not necessarily across classroom walls" (p. 33). Croitoru and Dinu (2016) performed a critical analysis of VLEs and suggested that Moodle would be their preferred VLE. The research here had an intended objective to explore the interaction of students with emerging mobile devices and VLE systems facilitated by 'early-adopting' and 'tech-savvy' educators. A decision was made to use Moodle as the VLE under investigation. Given that Moodle was associated with tech savvy lecturers, we assumed that lecturers using this VLE would use their mobile devices at the time to better interact with Moodle, reduce their time commitment, and render Moodle more interactive for students to use.

However, the recent research such as the Zainuddin, Idrus, and Jamal (2016) study further collaborates that, "Moodle is mainly used as a repository for materials" (p. 282). There is thus a consistent theme emerging from the literature that the emergence of mobile devices from around 2012 to the present time are not drastically altering the use of VLEs as namely textbook repositories, and that the findings of Fry and Love with regard to Blackboard are similarly holding true for Moodle despite the rise of mobile technology to access the VLEs. The literature suggests higher education institutions need to go further to motivate online adult learning by training and providing increased time allocation for lecturers to adopt mobile learning devices in a way that refocuses students' attention on active learning.

## 2. Method

### 2.1. Participants

Participation of the main survey comprised 83 first and second year business students studying at the University of Greenwich. The survey took place in 2012 as part of study to investigate whether Moodle was encouraging active learning. A fresh look at the data is warranted given that at the time it was not fully comprehended how access to VLEs may effect utilization. Now, we have fresh literature which suggests VLEs are still underutilized and we wanted to explore whether the rise of such technologies spurred utilization, or whether underutilization of VLEs remained consistently stagnant. The students reported business studies, human resources and organizational behavior, marketing, accounting and finance.

The sample was 30.1% male, 69.9% female; 16.9% 17–19 years old, 63.9% 20–24 years old, 9.6% 25–29 years old, 3.6% 30–34 years old, 4.8% 35–39 years old, 1.2% 50–54 years old; 21.7% were British White, 20.5% Other White, 1.2% mixed White-Asian, 16.9% Black, 25.3% Asian, 7.2% Chinese, 7.2% other ethnicity; 77.1% were UK home students, 22.9% were overseas students; 19.3% were first year students, 32.5% were second year students, and 47.0% were third year students; 47.0% owned an iPhone, and 53.0% owned a different type of mobile device such as Samsung, Nokia, Blackberry, and other types of devices.

### 2.2. Learning measures

Participants completed 24 questions which contained categorical item responses. The questionnaire asked participants the following questions: (a) demographic items such as age, gender, ethnicity year of study, (b) frequency of using Moodle, (c) whether accessing podcasted lectures improved the ability to learn, (d) whether reading textbooks on mobile devices were an effective way to revise, (e) whether the use of mobile technologies to access VLEs would continue to increase over the next three years, (f) whether mobile technologies would replace traditional learning; and (g) whether students use non-academic applications via mobile devices such as social networking and GPS technologies. Values e and f when associated with values (b) and (d) were intended to explore whether VLEs are being used as repositories for textbook materials rather than as a tool for active learning. Item (f) was an add-on to the survey to explore how students are using mobile technologies generally and to explore whether common applications could help render VLEs more appealing to surface learners.

### 2.3. Procedure

The items were presented in the same order to participants from January 2012 to April 2012. Survey responses were acquired via

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