

The Learning Impact of Virtual Learning Environment

Introduction

Virtual Learning Environment (VLE) is a web-based software system designed to facilitate learning and teaching with the use of tools and activities.

Students using a VLE can be set a 'task' to complete in class or at their own pace, time and location, they can contribute to synchronous and asynchronous discussions to help develop their learning.

Empirical evidence suggests that the use of a Virtual Learning Environment has an impact on student achievement, encourages independent learning, and increases students' motivation to learn. This article reports a study within a particular context, an English sixth form college, further testing hypotheses related to these claims in a positivistic manner. This study provides a snapshot of students' views about the use of the VLE and its impact on their learning, from which there are recommendations for teachers and teacher educators.

VLE use a literature review

This literature review outlines the background and development of VLEs to support teaching and learning. It starts with a brief historical background followed by general positive and then negative impacts of VLE use. The last section examines specific impacts of VLEs on independent learning and motivation. Each section, after the background, relates to the research questions and provides context for this work.

Virtual learning environments are widely used in education, in many sectors, typically to deliver instructional materials and facilitate communication. This article reports on an online survey into VLE use by 248 second-year students at an English Sixth Form College. The survey investigated the reported impact of using the college's VLE (Moodle) on learning and was based on three research questions which investigated: whether the use of a VLE has a positive impact on student learning; whether the use of a VLE in teaching and learning helps develop independent learning; and whether the use of a VLE increases students' motivation to learn. The statistically significant findings report that the use of Moodle produces improvement in learning and motivation to learn as reported by the student participants. The findings will be of broad interest to teachers as they indicate areas for attention in promoting VLE use to enhance learning.

Historical background on the use and development of VLEs

It is difficult to define exactly how long VLEs have been in use. The UK's Open University has been utilizing computers for learning since the 1970s, but it was in 2000 that the commercial computer-based VLE 'Blackboard' was patented. By 2010 Blackboard software was used by over 3700 educational institutions in more than 60 countries (Blackboard, 2011). The other most popular VLE, 'Moodle', was introduced in 2001. It was originally developed to help educators create online courses with a focus on interaction and collaborative construction of content and by 2011, Moodle had a user base in 212 countries with 49,365 active sites in more than 75 languages (Moodle, 2011). In the UK within the post-compulsory sector in 2008-9, 92% of further education colleges had a virtual learning environment; the figure has risen from 58% in 2003-2004.

As a result of the UK Government 2005 strategy paper *Harnessing Technology – transforming learning and children's services*, which emphasized institutions and learning providers making more effective use of technology reported on a sample of thirty-four schools investigating the impact of VLEs on students' learning. The reports were published between September 2005 and December 2007 and concluded that just over half of the schools surveyed were positive about the impact of VLEs on learning and teaching.

A further report in 2009 found frequently that the VLE was still primarily used as a repository for teaching materials and sometimes utilized for assignment uploading with limited use of interactive functions. Less than a quarter of the colleges were using the VLE to support independent learning, however, those that did were confident that technology had contributed to creative teaching providing learners with access to relevant content; and giving flexibility to delivery. Colleges were less sure about impacts on learner attainment, progression, and retention.

In 2008, as a result of the UK Government's 2005 strategy paper, Ofsted evaluated the development of VLEs in a sample of educational settings. This resulted in an Ofsted publication *Virtual learning environment: An evaluation of their development in a sample of educational settings*. Ofsted visited 41 providers, including 18 colleges, six primaries, and two secondary schools. Inspectors found that in all the environments the concept of VLEs was relatively new; colleges were making the most use and primary schools the least. In the best practice, VLEs were found to enhance learning particularly.

In summary, VLEs have a range of research reported positive impacts from various contexts. They can; promote reflection, accommodate the needs of students, increase enthusiasm and confidence, improve readiness to learn, and broadly reported above improved course assessment performance.

General negative impacts of VLEs

Recently a study of school teachers in the UK showed that VLE use was broadly limited to use as a work repository, a facility for setting homework and sharing sites with the students with very few staff utilizing the collaborative learning tools.

Staff time for training was cited as the main reason. Although this study does not deal directly with students' experiences it does offer some insight into why VLEs can negatively impact on learning. Finally, Demian & Morrice reported an analysis of HE student academic performance on two final-year undergraduate modules. For 'one the VLE has very little effect on students' academic performance ... but [for the other] a moderate effect on their performance. However, neither of these effects was statistically significant.

Does the use of a VLE have a positive (or negative) impact on student learning? Does the use of a VLE in teaching and learning help develop independent learning?
Does the use of a VLE for teaching and learning increase students' motivation to learn?

Impact of VLEs on Independent Learning and Students' Motivation to learn

In 1990 Hiltz reported on a study in New Jersey with data collected, via pre and post-course questionnaires, from a total of 132 high school students undertaking online courses, 96 in mixed-mode courses and 89 in traditional classroom settings.

The evaluation goals of the project were: to describe the nature of the educational experiences and outcomes comparing a VLE to the traditional classroom, and determine those conditions associated with good or poor outcomes. The survey reported that 55% of respondents agreed that their motivation was increased because other students read their posted comments, 56% agreed that they felt more involved in taking an active part in the course through collaborative tools such as forums, and 65% considered online courses to be more convenient. The word 'fun' was frequently used by those students who reported high levels of interest and involvement. Findings were supported by subsequent research which suggests that the teacher-student interaction is the critical factor in fostering both a sense of competence and student autonomy leading to increased motivation and independence.

In a report for the Open University, UK, *Motivation and mobile devices*, Jones and Issroff (2006) propose six reasons for why using a VLE might be motivating for students:

- Control over learning - students can define the tasks and activities they wish to engage in, they take responsibility for their learning.
- Ownership - increased access to technologies has encouraged widening participation. The opportunity to learn informally at a time, place and pace to suit is highly motivating.
- Learning-in-context – the opportunity to access resources and information in the relevant context with the ability to share it with others.
- Continuity between contexts – VLEs offer increased opportunities for formative assessment and feedback leading to benefits in terms of retention and achievement.
- Fun - learning online can be associated with 'fun'.
- Communication - communication and collaborative learning, such as the use of forums, chat and email for discussion and feedback. Crook suggests that collaborating with other people, given the right conditions, is in itself motivating.

Conclusion empirical research underpins the research questions and partially supports the stated hypotheses. Evidence suggests, but is inconclusive, that the use of a VLE has an impact on student achievement, that the use of a VLE encourages independent learning, and that the use of a VLE increases students' motivation to learn. However, none of the available research considered a UK sixth form college setting. The following section reports a quantitative survey conducted to gather data to test these hypotheses in such a context.

Concluding thoughts

Empirical research reported in the literature underpins the research questions and leads to the development of the hypotheses. This data confirms that use of a VLE encourages independent learning with the opportunity to learn informally at a time, place and pace to suit the learner providing flexibility for students to fit course work around busy lives. The literature review also provides evidence that the use of a VLE increases students' motivation to learn, promotes communication and collaborative learning, via the use of forums, chat and email for discussion and that the direct feedback is highly motivating.

For the data suggest that the use of a VLE has a positive impact on student learning. The composite score for question 8 reports that 53% of respondents either agree or strongly agree that the use of SFC Moodle has a positive impact on learning. The data suggest that the use of a VLE helps the development of independent learning.

Vygotsky emphasized that conceptual learning was a collaborative effort that required supportive dialogue, so it is reasonable to assume that online discussion via a VLE has the potential to enhance both collaboration and concept development. As suggested in the literature review it would appear however, that it is the collaboration tools for example forums, which are least utilized and require further development and implementation in order to have a positive impact on learning.

In a study of Internet-based MBA courses, Arbaugh found that the perceived usefulness and flexibility of a VLE were positively associated with student satisfaction with a course. From the learning perspective, a VLE can provide opportunities for practice and recall and accommodate a wide range of learning materials and formats e.g., multimedia.

Empirical research cited, suggests that the use of VLEs results in improvements in learning and teaching which lead to improved satisfaction, retention and achievement for a larger and more diverse student body. This study suggests that tasks on a VLE and the opportunity to learn at a personally defined place, time and pace encourage students to take a level of ownership for their learning which increases their independence and motivation to learn. The research in the literature also shows that the potential of VLEs depends on addressing the pedagogic issues associated with effective learning and ultimately on the overall quality of course design and learner support. Boud highlights a vital point that "ultimately, it is only the decisions which learners make about what they will or will not do which actually influence the outcomes of learning." Students need to take responsibility for their learning to ensure successful outcomes.

Ghurbhurun claims that “we’ve reached the tipping point in the use of e-learning and technology” and suggests that we have yet to discover the profound impact that such technologies may have on delivering a dynamic curriculum.

Whilst this study suggests that using SFC Moodle has a positive impact on student learning, it would have been interesting to establish if subject disciplines have differing impacts on learning. Equally it would be interesting to research which of the tools in the VLE for example, forums, quizzes, course handouts, have the greatest impact on student learning. This study has limitations due to the time available and the positivistic approach taken, however, the statistical analysis returned significant results but does not, and nor can it, provide depth.

Further work, exploring in a naturalistic, inductive way, might be conducted with staff and students to uncover how VLE use might be more effective in motivating, engaging and increasing positive impact on learning.

From this research we feel it is possible to make some management recommendations about the use of a VLE. Because of the statistical significance reported, although we recognize the post-positivistic nature of this work and its time boundedness, it is arguable that these recommendations could be generalized to similar educational settings.

- Provide staff CPD in the use and development of the VLE.
 - Wherever possible steps should be taken to ensure that all students have access to the VLE from home.
 - Consider minimum requirements for directed use of a VLE by students.
 - Implement strategies to encourage non-directed use of a VLE.
 - Provide opportunities and flexibility to allow students to be in control of their learning using a VLE.
 - Ensure that VLE use is interactive and not restricted to a role as an information repository.
- The last four of these are also relevant for teacher educators to consider as questions to pose to their student-teachers.