

EXAMINING TEACHERS' ROLE IN USING VIRTUAL LEARNING ENVIRONMENT TO SUPPORT CONVENTIONAL EDUCATION IN ICELANDIC SCHOOLS

By

GISLI THORSTEINSSON

University of Iceland, Reykjavik, Iceland

ABSTRACT

Running Information and Communication Technologies (ICT) classes using Virtual Learning Environments (VLEs) has become a high priority project for many educational institutions, as it offers opportunities for online education and support for conventional education. However, acquiring and deploying a VLE is a difficult task that concerns teachers' responsibilities and their mindset.

The author has run a series of studies to recognize pedagogical issues of applying a Virtual Learning Environment to support educational activities in school education. The main aim of the studies was to identify regarding the teacher's work that illustrates his mindset and responsibilities during ICT classes in an Icelandic elementary school. The research was based up on the following research questions:

(i) Which issues influence the teachers' role in using ICT to support school education?

(ii) How do these issues affect his mindset and responsibilities during ICT classes?

(iii). How can a teacher effectively manage these issues?

These questions were viewed using a range of explicit techniques in an action research mode. Data was collected from three, triangulated, studies. The data was analysed and used to formulate a new set of research questions and a more advanced exploration using a following series of case studies. The research indicates that teachers are not always able to make full use of ICT because they lack self-confidence, role conflicts, workload and time for preparation and skill to manage the technology inside the classroom. They need to have diverse capabilities, in order to enter the schoolroom with wide-ranging capabilities. The research also indicated that the teacher lacked self-confidence, in terms of knowledge and skill in ICT, but he was capable of solving most problems during the research. The teacher's work was complex and his multiple roles and responsibilities were not pre-defined. Therefore self-criticism became a part of his general mindset that affected his self-confidence and self-efficacy.

Keywords: ICT, Virtual Learning Environment, Teachers' Role, Mindset, Responsibilities, Pedagogy.

INTRODUCTION

The background of this research project is the application of ICT in Icelandic schools in the context of teachers work. The role of 'teacher' in using ICT in a class can be complex depending on the forms of pedagogy adopted. Typically, he will, at some time, carry out different roles affecting his mindset. He will have to organise and create the course content', setting the pace, monitoring learners' reactions and adjusting the delivery accordingly.

The Oxford English Dictionary Online (2013) defines the term mindset as: 'an established set of attitudes, especially

regarded as typical of a particular group's social or cultural values; the philosophy or values of a person; frame of mind, attitude and disposition'. The term mindset indicates 'set' or 'fixed'; however, it is readily apparent that an individual's mindset can develop, but this may be a slow process and thus may cause stress.

In this research, the teacher's background, including his education, his social status, attributed social value, his life experience in general and his role as an educator, were the basis of his mindset and his reflection on the development of his roles, in terms of the VLE, and enabled him to interpret

the activities he was undertaking in a manner acceptable to him.

When learning activities are more self-directed, the teacher often becomes a facilitator, assisting individuals or groups with progress, 'enforcing' the 'rules of engagement', helping with time and task management, and guiding students through the available resources. In most forms of delivery, there will be interruptions for clarifications and questions. The teacher as tutor must understand such interventions and respond to them. In group situations, the tutor must strike a balance between the needs of individuals and the group.

Though there are professional administrators responsible for much of the administrative work associated with course design and delivery, all teachers find them responsible for key components of a number of administrative processes. Some tasks are 'teaching administration' such as ensuring hand-outs are processed on time. Many teachers are also involved in the simple management of facilities and resources.

This paper first explains the background of the research and looks at the literature. Secondly it explains the research methodology and the outcomes. Finally, the author discusses the results and makes his conclusions of the research.

Using VLE to Favour Education

ICT refers to technologies that enable access to information through telecommunications, firstly focused on communication technologies. School activities include the Internet using computer technology (Hall, 2001; Paulsen, 2003; Thorsteinsson, 2007).

Computers in support of education are a broad and changing term due to the fast and changing nature of technology. Taylor (1980) and Blom and Monk (2003) classified computers used in education as tutors, tools and trainees. They indicated that the use of computers as both tutors and tools can progress and augment classroom learning and neither student nor teacher are required to know much about computers. Blom and Monk (2003) further categorised the role of computers within an educational setting, as below:

- *Tutor*: Often referred to as 'drill and practice' or 'computer-

aided instruction'. Learners are presented with information and are then usually quizzed on their subsequent knowledge.

- *Tool*: Learners direct the learning process, rather than being directed by the computer. This approach sees learning as an active process of constructing knowledge through experience.
- *Tutee*: Typically, learners use construction kits to help them reflect upon what they have learned through the innovation process.
- *Enabling computer supported collaborative learning*: Learners use network based software to learn and communicate with members of the teaching team. Learners can also become involved in educational online communities with students from different geographical regions.

Virtual Learning Environment (VLE)

A Virtual Learning Environment (VLE) is a software system formed to help teachers facilitate the management of educational courses, particularly by assisting them, and the learners, with course administration (Hall, 2001; Paulsen, 2003). Wilson (1996) defines the VLE as a computer-based environment that is a relatively open system, allowing interactions and encounters with other participants and providing access to a wide range of resources (1996, p8). Hall (2001) describes VLEs as terms used to illustrate various applications that track learners training and can include dissimilar functions.

The services provided by VLEs are designed for teachers, pupils, administrative personnel and parents. Admission to the VLE is through the Internet or an intranet and there is typically a possibility to work offline. A fundamental characteristic of the VLE is that educational activities can be undertaken 'anytime, anywhere' and are not reliant upon the old-fashioned school timetable or whether the learning is taking place inside or outside a school (Thorsteinsson, Page, Niculescu, 2010). It is therefore preferable that the VLE is connected to the users' school Management Information System (Vuorikari, 2004:9) (Figure 1).

Research Methodology

The author ran a series of case study lessons during two years

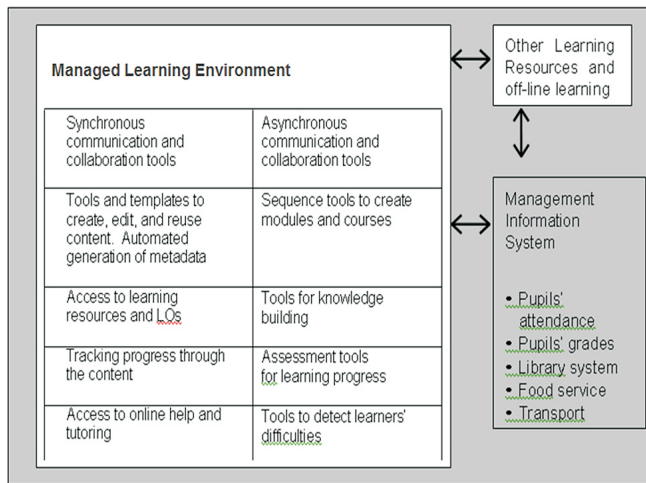


Figure 1. Potential features of a VLE (Vuorikari, 2004:9).

period with class 7. A research plan was established, on an aim and research questions. The teacher set up email accounts and registered students to the VLE; he also took digital photographs, in order to personalise the students VLE workshops. The main aim of the studies was to examine the teacher's role in using ICT in order to identify his mindset and responsibilities. The research was based up on the following research questions.

- (i) Which issues influence the teachers' role in using ICT to support school education?
- (ii) How do these issues affect his mindset and responsibilities during ICT classes?
- (iii) How can a teacher effectively manage such issues?

In the case study series, dissimilar kinds of qualitative data were collected in the form of interviews with the participating teacher and students; classroom observations; video recordings of students' activity when using the Virtual Learning Environment; screen video recordings; student work samples and the teacher's and researcher's logbooks. These multiple perspectives helped the examiner to 'validate and crosscheck results' (Patton, 1990, p. 244) and offered a good degree of triangulation (Denzin, 1984; Cohen., 2005).

As the research took place in a complex social/educational context, grounded theory (Glaser and Strauss, 1967) principles were used as a way of observing, describing and interpreting settings as sources of data. The key points in the data are marked with a series of codes, which are then grouped into emerging conceptual

categories. These categories are associated to each other as a theoretical clarification of the action(s) that repetitively resolve the main concerns of the partakers within a substantive area (Denzin & Lincoln, 1994).

Results

The data from this research indicated that the following elements influenced the teacher's mindset and responsibilities:

- Lack of technical help and instructions
- Role conflicts
- Lack of confidence
- Workload
- Preparation
- Self-criticism.

Discussion

Lack of Technical Help and Instructions

Throughout the research, the VLE generally worked well: it remained stable and the students registered easily. However, variety of issues associated with the use of the VLE arose during the enquiry, such as technical difficulties and upgrade requirements. The teacher noted how having to deal with the VLE technology would have been too difficult for a non-specialist teacher and considered that his experience of the equipment and software was important in overcoming any difficulties. Studies (i.e., Mumtaz, 2000) have highlighted several reasons why teachers do not apply computers in their work as lack of teaching experience, in terms of ICT, lack of on-site technology support for teachers, lack of assistance in directing pupils, when on the computer, the existence of ICT specialist teachers to teach students computer competence and lack of computer accessibility.

Role Conflicts

The teacher's work was complex and his multiple roles and responsibilities were not pre-defined. As the project featured an inherent action research element, the teacher was confronted with new circumstances and with improving his professional endeavours. He was also responsible for the maintenance of the school's hardware and software and such issues affected his mindset, lesson

preparation, the selection of teaching methods and his ability to make professional decisions, in terms of the appropriateness of when to use the VLE.

Walker (2000) and Witfelt (2000) noted how, in non-traditional schoolrooms, such as the open/global schoolroom, the roles and duties of the teacher have changed. For example, the teacher, as an agent, has to constantly bring up-to-date information and technology, in order to ensure learning is authentic and relevant. In blended learning, the instructor has to combine two or more teaching methods that makes his work complex (Worthington, 2008).

Lack of Confidence

This research indicated that the teacher lacked self-confidence, in terms of knowledge and skill in ICT, but he was capable of solving most problems during the research. The teacher noted that he himself did not have significant experience in dealing with the new software upgrades and he felt insecure on this. Consequently, it took time for both the teacher and the students to establish their ability to handle the computer facilities, in terms of both hardware and software. According to Bradley and Russell (1997), frequent technical problems and the expectation of mistakes during lessons are likely to decrease teachers' self-confidence and a lack of obtainable technical support is also expected to lead to teachers avoiding ICT, due to a fear of faults causing lessons to become unsuccessful (Cuban, 1999; Preston, 2000).

Workload

The teacher considered that the research was a substantial extra workload for him. Running the course for a whole day, while intense, would probably have offered more flexibility. Nevertheless, the teacher managed to organise some of the case study lessons inside the school schedule. In these lessons, however, he was disturbed by other teachers seeking his help because he was the school's computer administrator; they were also likely to be curious about the research. In this respect, conducting lessons after school may be more appropriate, in terms of allowing the class to work in peace. Manternach-Wigans (1999) noted, during his research, that teachers are often unable to make complete use of ICT because they need more time to

prepare for lesson and a like outcomes have been found in other research studies (see also Fabry & Higgs, 1997; Preston, 2000).

Preparation

After the first case study series, the teacher was given general training for lessons, with regards to the use of the VLE. Better preparation became part of the research plan for case study series two and three and help pages were set up inside the VLE. However, the teacher did not access the help pages, probably because his workload was high and his preparation time was often limited. Teachers need to have diverse capabilities, in order to enter the schoolroom with a wide-ranging capabilities and a related positive belief system is needed in the use of technology (Russell, 2003). The teacher had both experience as being a class teacher and ICT teacher. However, during the research he was also encouraged to spend time developing his own experience of using the VLE, mirroring the work the students were required to do.

Self-criticism

Self-criticism was, most likely, a part of the teacher's general mindset and this may have incorporated a lack of self-confidence and self-efficacy; self-efficacy is the belief that one is able of performing in a definite manner, in order to reach certain objectives (Ormrod, 2006). According to Bandura (1995, p2), self-efficacy is 'the belief in one's capabilities to organise and execute the courses of action required to manage prospective situations'. Self-efficacy affects how people feel and low self-efficacy is linked with depression, worries and helplessness (Ozdemir, 2007).

Conclusion

The specific role of the teacher was to guide and help students to undertake their studies, supported by the ICT. However, this was identified as complicated, in terms of managing the VLE technology and the students depending largely on the teacher's ability to administer such technology. The teacher had to adopt multiple roles, including organising of courses, lesson preparation, identifying appropriate teaching methods and applying these in various contexts, solving any technical problems, in terms of both hardware and software, teaching fundamental skills and training students in the use of the

VLE, teaching inside the VLE, employing appropriate teaching methods during lessons, being both instructor and facilitator, engaging parents in helping students with their homework.

The novelty and complications of running lessons within the framework of VLE caused a conflict in roles for the teacher, which appeared to increase his insecurities and made him more self-critical. The teacher lacked confidence, in terms of the course plans he had developed in conjunction with the researcher; he also lacked confidence in his teaching and in using the VLE. During the study, the teacher experienced a conflict in roles, in terms of administrative work and tutoring; thus, his administrator rights and ICT skills were important in the use of the VLE. These difficulties were caused by his limited skills and knowledge, but were also the result of limited preparation time and limited practice for lessons.

Reflective self-criticism was a part of the general mindset of a teacher and, in this case, the teacher appeared to display a lack of confidence, possibly due to the context of the research and unfamiliarity with the VLE. A detailed instruction, training and to build on experience would have made him feel more confident and the only way forward. His approach would also have been much easier today, as computer literacy has improved and technology has progressed.

References

- [1]. Bandura, A. (1995). *Self-efficacy in changing societies*. Cambridge: Cambridge University Press.
- [2]. Blom, J.O. and Monk, A.F. (2003). A theory of personalisation of appearance: why users personalise their PCs and mobile phones. *Human-Computer Interaction*, Vol. 18, No. 3, pp. 193-228.
- [3]. Bradley, G. and Russell, G. (1997). Computer experience, school support and computer anxieties. *Educational Psychology*, Vol. 17, No. 3, pp. 267-284.
- [4]. Cohen, L., Manion, L. and Morrison, K. (2005). *Research methods in education* (5th ed.). London: Taylor & Francis e-Library.
- [5]. Cuban, L. (1999). The technology puzzle. *Education Week*, Vol. 18, No. 43. Retrieved (28. March, 2013) from <http://www.edweek.org/ew/vol-18/43cuban.h18>
- [6]. Denzin, N.K. (1984). *The research act*. Englewood Cliffs, NJ: Prentice Hall.
- [7]. Denzin, N.K. and Lincoln, Y.S. (Eds), (1994). *Handbook of Qualitative Research*. Thousand Oaks, CA: Sage Publications, Inc.
- [8]. Fabry, D. and Higgs, J. (1997). Barriers to the effective use of technology in education. *Journal of Educational Computing*, Vol. 17, No. 4, pp. 385-395.
- [9]. Glaser, B.G. and Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine Publishing Company.
- [10]. Hall, B. (2001). *New Technology Definitions*. Retrieved (5. April 2013) from www.brandonhall.com/public/glossary/index.htm
- [11]. Manternach-Wigans, L. (1999). *Technology integration in Iowa high schools: perceptions of teachers and students*. Iowa State University.
- [12]. Mumtaz, S. (2000). Factors Affecting Teachers' Use of Information and Communications Technology: a review of the literature. *Journal of Information Technology for Teacher Education*, Vol. 9, No. 3, pp. 319-342.
- [13]. Ormrod, J.E. (2006). *Educational Psychology: Developing Learners* (5th ed.), NJ, Merrill: Upper Saddle River.
- [14]. Ozdemir, Y. (2007). The Role of Classroom Management Efficacy in Predicting Teacher Burnout. *International Journal of Social Sciences*, Vol. 2, No. 4.
- [15]. Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods* (2nd ed.). Newbury Park, CA: Sage.
- [16]. Paulsen, M.F. (2003). *Online Education and Learning Management Systems*. Oslo: NKI Forlaget.
- [17]. Preston, C., Cox, M. and Cox, K. (2000). *Teachers as Innovators: an evaluation of teachers' motivation in the use of ICT*. MirandaNet London. Accessed (24. January, 2013) from http://www.mirandanet.ac.uk/partners/promethean_ambassadors.htm
- [18]. Russell, R.S. and Meikamp, J. (1994). Creativity training-A practical teaching strategy. In: Montgomery, D. (Ed.), *Rural Partnerships: Proceedings of the Annual*

National Conference of the American Council on Rural Special Education, ERIC Document Reproduction Services, No. Ed369621.

[19]. Taylor, R. (1980). *The Computer in the school: tutor, tutee*. New York: Teachers College Press.

[20]. The Oxford English Dictionary Online (2013). Retrieved (5. April, 2013) from <http://www.oed.com/>

[21]. Thorsteinsson, G., T. Page, M. Lehtonen, A. Niculescu (2007). Innovative Technology Education in a Virtual Reality Learning Environment, *Studies in Informatics and Control*, Vol. 16 (3), Sept. 2007, ISBN 1220-1766, pp. 297-306.

[22]. Vuorikari, R. (2004). *Why Europe Needs Free and Open Source Software and Content in Schools*. Brussels: European School Net (online). Retrieved (5. April 2013) from www.eun.org.

[23]. Walker, M. (2000). Learning how to learn in a technology course: A case study. *Open Learning*, Vol. 15, No. 2, pp. 173-189.

[24]. Wilson, B.G. (1996). *Constructivist Learning Environments: Case Studies in Instructional Design*. Englewood Cliffs, New Jersey: Educational Technology Publications.

[25]. Witfelt, C. (2000). Educational multimedia and teachers' needs for new competencies to use educational multimedia. *Education Media International*, Vol. 37, No. 4, pp. 235-241.

[26]. Worthington, T. (2008). *Blended Learning: Using a Learning Management System Live in the Classroom*. The Australian National University. Retrieved (13. May 2013) from <http://www.tomw.net.au/blog/labels/ANU.html>.

ABOUT THE AUTHOR

Dr. Gisli Thorsteinsson is currently working as an Associate Professor at Iceland University, in the Department of Design and Craft. He was the Chairman of the Association of Icelandic Industrial Arts Teachers from 1995-2003 and is associated with the NST Coalition of Industrial Arts Teachers in Scandinavia. From 2000 he has been on the Board of 'Nordfo', the Pan Scandinavian cooperative researching art and design projects in Scandinavia. In 1999 he was involved in the National Curriculum development for technology education in Iceland and wrote the curriculum part for Design and Craft. He is one of the initiator of the pedagogy for Innovation Education in Iceland and holds a doctoral degree from Loughborough University focusing on this area.

