Examining Teachers' Mindset and Responsibilities in Using ICT

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Abstract: In a digital world, more and more academic disciplines taught in schools at all levels make use of Managed Learning Environments (MLEs) which have been assigned a high priority status in many educational institutions. In this rapidly changing environment, technology plays an essential role as it offers opportunities for online education and support for conventional education. However, acquiring and deploying a MLE is a difficult task that concerns teachers' responsibilities and their mindset. This paper seeks to explore the pedagogical issues involved in applying a managed learning environment to support educational activities in school education. The approach was based 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 when classes are conducted in a computerized space? and (iii) How can a teacher effectively manage these issues? These questions were viewed using a range of qualitative research methods while running a series of case study lessons. The research indicates that teachers are not always able to make full use of ICT because they lack self-confidence, time for preparation and the technological skills needed to successfully manage the teaching-learning process inside and outside the classroom. Findings also suggest that there are other problems associated with new roles, role conflict and the perception of increased workload.

Keywords: ICT, Managed Learning Environment, teachers' role, mindset, responsibilities, pedagogy.

1. Introduction

The background of this research project is the application of *ICT* 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, set the pace, monitor learners' reactions, adjust the delivery accordingly and at times conduct computer-based testing.

The *Oxford English Dictionary Online*(2011) 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, was the basis of his mindset and his reflection on the development of his roles, in terms of the MLE, 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-all these well-aligned with the aims of the particular school.

Though in many, but not all schools, there are professional administrators responsible for much of the administrative work, all teachers find themselves responsible for key components of a number of administrative processes. Some tasks are 'teaching administration' such as ensuring that hand-outs are processed on time. Many teachers are also involved in the simple management of facilities and resources.

This paper firstly explains the background of the research and looks at the literature. Secondly, it explains the research methodology and the outcomes. Finally, the authors discuss the results and make their conclusions of the research.

2. ICT 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, et al., 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:

1. *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.
2. *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.
3. *Tutee:* Typically, learners use construction kits to help them reflect upon what they have learned through the innovation process.
4. *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.

Managed Learning Environment (MLE)

A Managed Learning Environment (*MLE*) 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 MLE 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 MLEs as terms used to illustrate various applications that track learners training and can include dissimilar functions.

The services provided by *MLEs* are designed for teachers, pupils, administrative personnel and parents. Admission to the MLE is through the Internet or an intranet and there is typically a possibility to work offline. A fundamental characteristic of the MLE 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 MLE is connected to the users' schools Management Information System (Vuorikari, 2004:9).

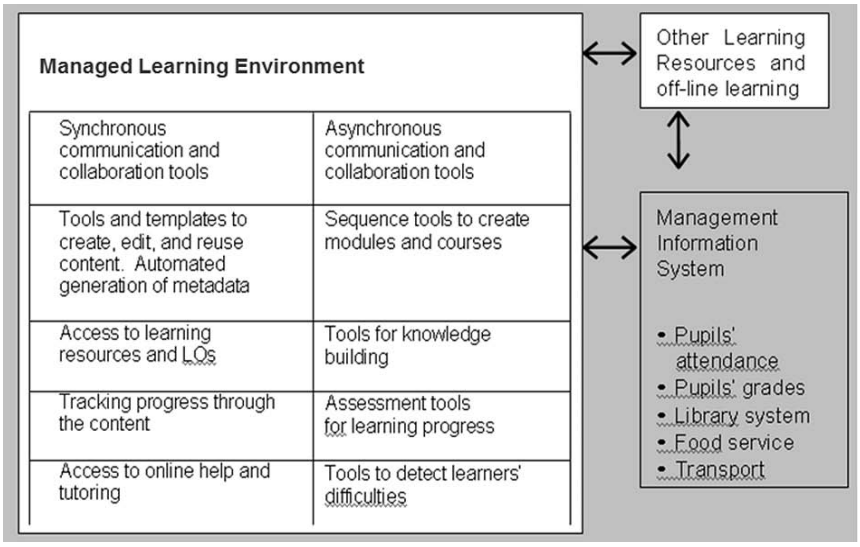

Figure 1. Potential features of a MLE (Vuorikari, 2004:9)

3. Research Methodology

A series of case study lessons were conducted with an Icelandic elementary class during a two-year period. A research plan was established with a well defined aim based on certain research questions. The teacher set up email accounts and registered students to the MLE; he also took digital photographs, in order to personalise the students *MLE* workshops. The main aim of the study was to examine the teacher's role in using ICT in order to identify his mindset and responsibilities. The research was based upon the following research questions:

1. Which issues influence the teachers 'role in using ICT to support school education?
2. How do these issues affect his mindset and responsibilities when classes are conducted in a computerized space?
3. How can a teacher effectively manage these issues?

Wide-ranging data was needed to triangulate the results and support the reliability. Therefore, dissimilar kinds of qualitative data were collected in the form of interviews with the participating teacher and students; logbooks; classroom observations; video recordings of students' activity when using the managed learning environment; screen video recordings; and the teacher's and researcher's logbooks. These multiple perspectives helped the examiner to 'validate and crosscheck results' (Patton, 1990: 244) and offered a good degree of triangulation (Denzin, 1984; Cohen et al., 2005). Other additional material were also taken into account through the literature. The specific data instruments used are listed below.

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. Open coding was used in the process of data analysis, based on grounded theory principles. The key points in the data were marked with a series of codes and grouped into emerging conceptual categories. The researcher formed initial categories of information about the teacher's mindset and responsibilities being studied (Creswell, 1998).

Grounded Theory is a naturalistic approach, providing the framework to develop theory based on observations. It is a qualitative method, based on several stages of analysis of primary data. Open coding is first used to generate a set of themes, which are then categorized into higher level concepts using a process called focussed coding. The researcher maintains an open mind in order to find as many ideas and issues as possible. Similarities in the outcome are classified into main categories that can be used for discussions and conclusions or for further research (Emerson, 1995). 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).

The raw data was collected. Data from each source was then summarised; for example, there were 6 teacher interviews, which were summarised separately and then used to generate categories together. These categories were then discussed and conclusions drawn. The process was repeated for all the data sources listed above. Finally, the categories from all data sources were brought together under overall categories. These categories were then used to triangulate the findings and were analysed in relation to each other and the

Table 1. Data collection methods used in the enquiry

	Data Sources	**Q1 Answer**	**Q2 Answer**	**Q2 Answer**
1.	Interviews with the teacher	x	x	x
2.	Interviews with the students group		x	x
3.	The researchers logbook	x	x	x
4.	Video recordings in the classroom	x	x	x
5.	The teachers logbook	x	x	x
6.	Observations	x	x	x

literature and conclusions were drawn. The data was used as follows:

Table 2. The manner of data treatment

The Data Analysis
1. Raw data collected;
2. Raw data summarised;
3. Summaries analysed and classified into categories;
4. Findings discussed and conclusions written for each data source;
5. All the categories from the three data sources brought together and classified;
6. Overall discussion written and triangulation established;
7. Conclusions were drawn relating to the research questions.
8. Categories formulated

4. The Main Research Outcomes

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

1. Lack of technical help and instructions
2. Role conflicts
3. Lack of confidence
4. Workload
5. Preparation
6. Self-criticism
7. The teacher's mindset and responsibilities
8. Managing use of ICT in a school context

5. Discussing the Results

5.1 Lack of technical help and instructions

Throughout the research, the MLE generally worked well: it remained stable and the students registered easily. However, variety of issues associated with the use of the *MLE* arose during the enquiry, such as technical difficulties and upgrade requirements. The teacher noted how having to deal with the *MLE* 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, lack of computer accessibility and even the existence of ICT specialist teacher whose main role is to help students achieve computer competence.

5.2 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 MLE.

Walker (2000) and Witfelt (2000) noted how, in non-traditional school rooms, such as the open/global school room, 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 make his work complex (Worthington, 2008).

5.3 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 in 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 et al., 2000).

5.4 Workload

The teacher considered that the computer-related work 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 happened to be 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 alike outcomes have been found in other research studies (see also Fabry& Higgs, 1997; Preston et al., 2000).

A variety of educational software programs such as ExamView® Pro Testing Software, Blackboard, etc. may be found in many schools and universities nowadays while teachers are supposed to add course summary files and create test banks for their courses and then introduce them on these platforms in predefined electronic formats for on-line learning and testing. For most teachers this has proved to be a time-consuming activity which increases the responsibilities of the teaching position. Keeping administrative bureaucracy and paperwork to an absolute minimum is essentially the driving force. A substantial reduction in administrative expenses may indeed have been achieved. However, the overall quality of testing has largely fallen especially in the human disciplines. It has been shown that students' grades obtained through electronic assessment tools do not accurately reflect the proficiency level of the learners. Therefore the reliability and validity of these computer-based tests become questionable (Niculescu, 2013:2).

5.5 Preparation

After the first case study series, the teacher was given general training for lessons, with regards to the use of the *MLE*. Better preparation became part of the research plan for case study series two and three and help pages were set up inside the *MLE*. 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 school room with a wide-ranging capabilities and a related positive belief system needed in the use of technology (Russell et al., 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 *MLE*, mirroring the work the students were required to do.

5.6 Self-criticism

Reflective self-criticism was a part of the teacher's general mindset. It was, furthermore, a part of his 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 (1995:2), 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).

5.7 The teacher's mindset and responsibilities

In this research, the teacher's life experiences in general and his role as an educator, his education, his social status of attributed social value was a basis of his reflection that enabled him to interpret the ICT activities he was undertaking in a manner acceptable to him.

To establish ICT activities, the teacher is required effective training and significant personal experience in the use of the MLE (Walker, 2000; Witfelt, 2000). The novelty of the new technology and complications arising from the teacher conducting lessons within the framework of blended learning meant that there was conflict between the teacher's roles of administrator and tutor, causing him to feel insecure. The increase in the number of facets to the teacher's professional role appeared to be largely caused by the additional complication of adding the MLE to lessons and limited preparation (Bradley & Russell, 1997).

The research also indicated that the teacher also lacked confidence in teaching IE and this was partly due to his responsibility for implementing appropriate teaching methods for the new technology, solving technical problems and adapting to new circumstances (Hennessey & Deaney, 2004).

5.8 Managing the ICT in a school context

It was identified in this research that the use of the MLE is largely dependent on the teacher's ability to manage it. However, the teacher also had to manage many other roles at the same time. Bonk et al.'s (2002) research similarly indicated that teachers have to co-ordinate many roles and responsibilities within the context of ICT, in order to achieve e-learning success. A delicate and informed balance between these roles is vital to the success of e-learning (Bonk et al., 2002).

It was vital to give the teacher both a general training for lessons while managing the use of the MLE. A preparation for lessons has to become a part of his teaching plan including managing the MLE. Using help pages MLE, specific tutorials and manuals are also vital part of the preparation. The teachers own personal experience of using the MLE is furthermore a key to his success in both teaching the students using the MLE and making him able to take part in the online activities.

6. Conclusions

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 *MLE* technology and the students depending largely on the teacher's ability to administer such technology. The teacher had to adopt multiple roles, including organising courses, preparing lesson plans, 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 MLE, teaching inside the MLE, 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 MLE 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 *MLE*. 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 MLE. 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 the 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 *MLE*. A detailed instruction, training and building on experience would have made him feel more confident. The approach will probably be much easier in the near future as computer literacy has improved and technology has progressed.

Dewey asserted that, if a teacher teaches today as he was taught yesterday, he will rob his students of tomorrow (Turkmen, 2006). Thus, the use of technology can help teachers relate to today's students, who are very media aware, prompt new approaches to the curriculum and encourage developments in teaching skills. Teachers will have to rise to the challenge to be up to date with their skills and knowledge if they are to meet the students' needs in the use of ICT. However, we should admit that teachers' endeavour to handle these requirements may be difficult or demanding at times.

Because of the local conditions, teaching practices and the limited scope of the research findings from the present study may or may not be applicable to other educational settings.

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