What are the factors that contribute to ineffective and limited use of Learning Management Systems (LMS) in the schools?

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Abstract

Data from a previous study1 show that, although the interviewed teachers were considered to be the ones who used a Learning Management System (LMS) most in their schools, their use of features and functions of the LMS was very limited and ineffective. More importantly, they used the LMS to enhance their traditional way of teaching, which was teacher-centered and aligned with industrial-age practices. This is a follow-up study examining the factors that contribute to the teachers’ ineffective and limited use of features and functions of LMSs. Based on the data from the previous study2, a secondary data analysis of the semi-structured interviews with seven teachers and one technology coordinator was conducted to reveal the factors that contribute to ineffective and limited use of the LMS by the teachers.

Introduction

Instructional technology has become a part of our educational lives (Cuban, 1986) and an interesting area in which to conduct research since the introduction of instructional radio in the 1920s and instructional television in the 1950s. Since then, the availability of technology has increased in public schools remarkably. In 1981, there was one computer for every 125 students in the schools. In 1991, the availability increased to one for every 18 students, and in 2000, there was one for every five students in the schools (Christensen, Horn, & Johnson, 2008).

Classrooms opened their doors to the technology as early as the 1950s; however, technology is still trying to enter the classrooms because there are so many constraints between the doors of the classrooms and the educational technology. In this paper, we will focus on the Learning Management System (LMS), which is considered one of the most recent promising educational technologies used in the schools (Gilhooly, 2001). We will present the factors that contribute to ineffective and limited use of LMS among interviewed classroom teachers and the technology coordinator of the school district.

The definition of LMS might differ with regards to how it is being used or the perception of how it should be used. In a nutshell, we define LMS as an integrated educational software interface that has a number of essential educational components related to learning and teaching. Reigeluth, Watson, Watson, Dutta, Chen & Powell (2008) propose four major functions of information-age educational computing. These functions are (1) record keeping for student learning, (2) planning for student learning, (3) instruction for student learning, and (4) assessment for student learning. They also identify secondary functions of an information-age educational system as (1) communication, (2) general student data, (3) school personnel information and (4) LMS administration.

Today, most LMSs have integrated components that can facilitate some of the information-age functions mentioned above. They have many outstanding features and functions that can help teachers to facilitate and improve students’ learning. However, availability of built-in information-age functions in LMSs does not mean that teachers are using all of those functions and features effectively and adequately.

In fact, research shows that teachers are using educational technology to enhance teacher-centered instruction. Russell, Bebell, O’Dwyer and O’Connor (2003) point out that computer use is usually perceived as “a special event or an add-on to the traditional curriculum” (p. 3). Moreover, Pea (2000), Christensen et al. (2008), and Brown and Green (2008) report that despite the high investments on educational technology, their use in the schools is very limited and the effectiveness of the current level of integration is an important concern.

Theoretical Framework

Hew and Brush (2007) analyzed 48 previous studies that presented empirical research findings related to barriers to educational computing in K-12 schools. Based on these studies, the authors identified 123 different barriers to technology integration. They classified these barriers into 6 categories: “resources”, “knowledge and skills”, “institution”, “attitudes and beliefs”, “assessment” and “subject culture”. The authors provided a relative frequency graph of these categories as shown in Figure 1.

Figure 1. Relative frequency in which the barriers were mentioned in the past studies, from Hew and Brush (2007).

Figure 1 illustrates that “resources” is the first ranking barrier with a rank of 40%. The second ranking barrier is “knowledge and skills” with a rank of 23%. The percentages of the other categories are pretty low in relation to these two categories. Therefore, in this study, we will focus on these two top ranking barriers to the use of technology in K-12 schools.

According to Hew and Brush (2007), without enough resources provided to the teachers, there is less opportunity for them to integrate technology into the curriculum. The researchers identified that “resources” have four different sub-categories, including “technology”, “access to available technology”, “time”, and “technical support”. Furthermore, teachers’ lack of “knowledge and skills” is an essential concern, since teachers need to have enough technology background in order to effectively use educational technology in the classrooms.

Methods

Data from a previous study show that although the interviewed teachers were the ones who used the LMS most in their schools, their use of LMS features and functions was very limited and ineffective. More importantly, they used the LMS to enhance their traditional way of teaching, which had a teacher-centered focus.

This is a follow up study to examine the factors that contributed to the teachers’ ineffective and limited use of the features and functions of the LMS. Participants in this study were seven classroom teachers from different subject areas and different grade levels and one technology coordinator in the school district. All these teachers were from the same school district but from three different high schools. Two of the schools had a traditional curriculum; however, one of them had a curriculum that was highly focused on technology-based activities and project-based learning, which are aligned with the information-age paradigm of education. Use of Moodle among the classroom teachers was investigated in this study since Moodle was the predominant LMS used in the school district.

Existing data from semi-structured interviews with the seven teachers and the technology coordinator were used to identify the factors that contributed to the interviewed teachers’ ineffective and limited use of Moodle. Data

were gathered from seven classroom teachers and one technology coordinator using the semi-structured interviews. Each interview took about an hour to an hour and half for each of the participants. These interviews were audio-recorded and transcribed verbatim.

The primary data analysis method was secondary content analysis. A coding sheet was created using the data from the semi-structured interviews with the technology coordinator and the seven classroom teachers in order to identify the factors that contributed to ineffective and limited use of Moodle.

**Results**

The findings illustrate that “resources” and “knowledge and skills” were the most significant factors that contributed to the limited and ineffective use of the LMS among these teachers, which is consistent with the theoretical framework by Hew and Brush (2007).

With respect to the “resources” factor, although interviewed teachers had access to the technology (Moodle), the data show that three out of the seven teachers and the technology coordinator described a number of different technical problems they faced while using Moodle, which implies their need for technical support. In addition, the technology coordinator and five of the seven teachers pointed out that they would like to see some more integrated functions in Moodle, such as a real-time group collaboration tool (e.g. Web 2.0 technologies), a flexible rubric tool, a teacher collaboration tool, and a video conferencing tool. In addition, one of the teachers expressed teachers’ concerns about time to create instructional materials using Moodle. He described some of his colleagues’ hesitancy to use Moodle due to their limited time.

With regards to the “knowledge and skills” factor, the interview data illustrate that the technology coordinator and five out of seven teachers expressed the need for training to learn the features and functions of Moodle. Since most of the teachers were not familiar with all the features and functions that Moodle provides, they used the LMS in a limited manner.

The interview data also show that the teachers’ use of Moodle varied based on the type of the school. As mentioned in the methods section, only one of the schools had a technology-focused and project-based curriculum, which is aligned with the information-age paradigm of education. Two out of the seven teachers were from this school. Our analysis of interview data illustrates that these two teachers used Moodle with respect to the information-age functions identified by Reigeluth et al. (2008), and their activities involved a student-centered learning environment. Data from these two teachers show that they did not have any major problems with technology skills; however, they wanted to see more features and functions in Moodle, which implies their need for a more integrated and functional educational technology.

**Discussion and Future Research**

Another important question emerged from the interview data. There are schools that have undergone paradigm change from the industrial-age to the information-age in the United States. In these schools, technology use is fostered and required among teachers and students in order to accomplish learning goals. In these schools, technology use is not dependent on the teachers’ preferences, since the schools were designed with an educational technology focus. Therefore, educational technology is not just an additional tool to be used, but an important element of teaching and learning in these schools (Edutopia, 2010).

With reference to the adequate and effective use of educational technology in schools that have undergone paradigm change, the industrial-age paradigm itself might be the biggest factor that contributes to limited and ineffective use of an LMS by teachers in traditional schools today. In addition, as mentioned in the results section, there is an emerging need for a more integrated and functional educational technology that can facilitate all of the information-age functions identified by Reigeluth et al. (2008).

To this end, we see a great potential in Personalized Integrated Educational System (PIES) as a promising educational technology, which can meet the needs of students and teachers in the information age. PIES is a unique concept to define an educational technology which has all of the information-age functions identified by Reigeluth et al. (2008) with an open source architecture incorporating most recent emerging technologies including Web 2.0 and online resources available in order to enhance and improve students’ learning. Further research needs to be conducted for the design and development of PIES in order to facilitate teachers’ use of technology systems more effectively and adequately.
References


