

A MUNICIPAL IMPLEMENTATION OF A NEW LEARNING MANAGEMENT SYSTEM IN K-12 SCHOOLS: THE TEACHER PERSPECTIVE

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Abstract

Municipalities continue to seek ways to enhance communication, information and documentation for teachers, students and parents through the implementation of learning management systems in schools. In this paper, the launch of a system for K-12 schools in a municipality in Sweden is studied from the teacher perspective. Survey comments submitted by the teachers (N=470) were analysed using a modified version of Koole's (2011) Framework for the Rational Analysis of Mobile Education. The findings show possibilities such as communication and documentation, as well as challenges related to usability, access and resistance. Lessons learned regarding the implementation of the system are presented.

Introduction

This paper focuses on the implementation of a new Learning Management System in a municipality in Sweden. The expectations for the uptake and use of Information and Communication Technologies (ICT) in schools have been high in policy both for teacher use and student learning (EC, 2010; OECD, 2012). The expectations regarding teachers' uptake and use of ICT are enhanced learning outcomes, increased student engagement, administration that is more efficient and the organization of learning (Penuel, 2006; Perrotta, 2013). However, these expectations appear to be difficult to see in practice in schools (cf. Cuban, 2001, 2013). Teachers often receive the blame for not integrating ICT in their teaching (Hixon & Buckenmeyer, 2009) including challenges such as lack of time and training (cf. Håkansson Lindqvist, 2015; Olofsson, Lindberg, Fransson, & Hauge, 2015; Vrasidas, 2015). Thus, teachers may also be considered to be a challenge, or a barrier, instead of the force of change, which they could be (Underwood & Dillon, 2011).

Research on ICT in education reveals that although teachers are gradually starting to integrate ICT into their teaching, significant differences are observed in the ways ICT is integrated in the K-12 classroom (cf. Tondeur, Cooper, & Newhouse, 2010). There also appear to be differences in how teachers take up ICT in their teaching. Sipilä (2014) reports that teachers with advanced ICT competence tend to use ICT frequently, while the majority of teachers do not have the skills or knowledge to use ICT to promote learning to a full extent. This may also be true for school leaders in their task to lead teachers in this work. School leaders are considered to be key actors in this process. However, they most likely have little training or competence for

making the move to a transformative framework for teaching and learning with ICT (cf. Kamylyis & Punie, 2013).

The use of ICT in schools, instead of opening up new opportunities for teaching and learning, has “bent technologies to extend existing pedagogical, curriculum delivery, and assessment practices” (Halverson & Smith, 2009, p. 52). According to these researchers, schools’ experiences of ICT can be described as a “revolution in technologies for measuring and guiding learning” (p. 53). For many teachers, Learning Management Systems (LMS) are used to achieve administration that is more efficient and organize students’ learning. These systems also provide a base for communication with students, other teachers and parents. In line with the uptake and use of ICT in the classroom, the use of an LMS also demands time and professional development.

In the context of K12, Lochner, Conrad and Graham (2015) studied K12-teachers’ concerns regarding the implementation of an LMS including awareness, information, personal, management, consequence, collaboration and refocusing concerns. These researchers’ results showed a lack of awareness among teachers as well as strong concerns regarding the management of the LMS implementation. This also involved personal abilities to adopt the LMS including information regarding the effects of the LMS on their teaching practices (Lochner et al., 2015). Cheok and Wong (2015) discuss “flexibility, interaction, perceived usefulness and perceived ease of use” as aspects, which are important in the implementation of an LMS, and which must be considered. Further, teachers’ attitudes, anxiety and self-efficacy will influence the efficiency of the uptake of the LMS, and therefore also the need for training and support. Thus, “the system, the teacher and the organization, need to work hand-in-hand in order to make the LMS in schools a success” (Cheok & Wong, 2015, p. 215). In this paper, a case from a municipality in Sweden is used to understand how teachers in K-12 experience the implementation of a new LMS.

Purpose

The purpose of this paper is to gain an understanding of how K-12 teachers in a municipality perceived the implementation of a Learning Management System (LMS) and to gain insight into the possibilities and challenges they experienced as end users.

Context

In the municipality studied, LearningRoom (LR) was chosen as an LMS for all public K-12 schools in the municipality by the school authorities. This top-down initiative was preceded by an evaluation, which took place at a central unit responsible for ICT in the municipality. The reasons for implementing LearningRoom according to the municipality were among others: creating structure for both educators, students, school leaders and parents and facilitating communication with parents on what happens in school such as plans, schedules, development, and children's learning in order to make them more involved. This involved having everything at the same place in one system, with hopes to reduce teachers' workload in order to provide more time with the students. The system was based on the needs of the school and

replaced systems with expired contracts. During the spring of 2014, the first schools started using the system, and it was rolled out to all the schools in the municipality in the following year. The school leader at each school was seen as a key actor and was responsible for the implementation at their school.

Method

The data used in this study was gathered through a survey sent to all 2,524 teachers connected to the system. The data used in this paper was collected from three optional free text fields in the online survey from the answers from 470 respondents (teachers) (N=470) from 49 different K-12 schools in the municipality. Questions in the survey concerned the following themes: respondents' background, prior experience with learning management systems in general, and experiences from using the specific system LR. All data from the free text fields were imported to NVivo and were classified according to the framework for analyses presented below. Each answer was processed as one single entity, and therefore the analytic unit for the coding. Each unit received a specific number, which follows the comment in parentheses.

Framework of Analysis

In order to conduct the analysis of the free text fields, or comments, in the survey, a framework based upon Koole's (2011) model Framework for the Rational Analysis of Mobile Education (FRAME) was applied. The FRAME model is a heuristic model, which was used as a lens in the analysis of the data, in order to provide structure during the categorisation of the collected data. The FRAME model consists of three circles which contain the *Device Aspect*, the *Learner Aspect* and the *Social Aspect*. In this paper, three main categories were used in the model representing different aspects of the system implementation. *System Characteristics* takes into consideration the features, properties and usability of the system (LR). *Teacher Needs* focuses on the individual teachers' characteristics and needs such as emotions, knowledge, learning needs, history and the ability to utilise the system. *Social Aspects* considers social processes, information sharing, collaborating and communication between teachers, students, parents and other stakeholders in the system as shown in Figure 1.

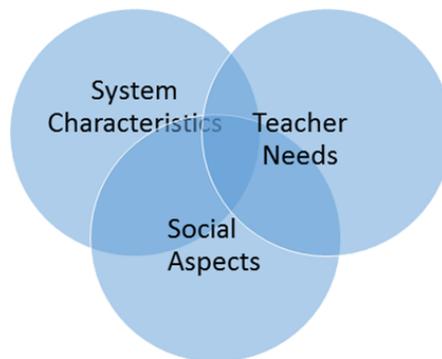


Figure 1. Koole's (2011) FRAME model adapted to System Characteristics, Teacher Needs and Social Aspects.

The different analytic entities, System Characteristics, Teacher Needs and Social Aspects to some degree overlap each other as illustrated in Figure 2. According to Koole (2011), these occurrences are of interest since they can provide additional information in the analysis.

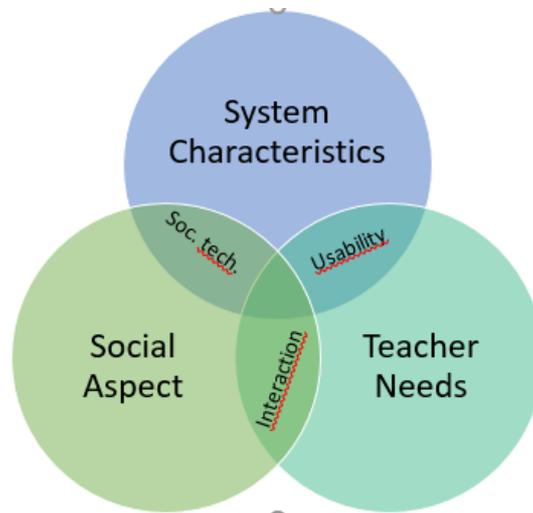


Figure 2. Koole's (2011) FRAME model adapted. Overlap between the categories.

The intersection Between System Characteristics and Teacher Needs provides information about *Usability* such as the teachers' thoughts of and feelings when using the system. Between Teacher Needs and Social Aspects there is an overlap that refers to the *Interaction* between Teachers Needs and Social Aspects. In the last area, between Social Aspects and System Characteristics, is *Social Technology* that refers to in what way the social aspects and the system characteristics interact and support or restrain action and integration within the system.

Results

In this section, the results are presented as follows: System Characteristics and Usability, and Teacher Needs and Interaction and Social Aspects and Social Technology.

System Characteristics and Usability

A majority of the teachers had difficulties using LR, finding the system hard to work with since it requires many clicks. It is hard to navigate in the system, since the paths are not intuitive for the teachers: *Many clicks-not good for my health (1)* and *It is tedious to get to the right place and difficult to have an overview of activities (2)*.

One teacher describes the situation as: *It's insane that you cannot print all submitted works for a given submission. As it is now, I have to click on each individual student and click my way to work and then print. From the side of the "work" when the actual work (with the list of students) is front, so it is four (5!) clicks per job to be replaced. In a class with 30 students, it will be a damn clicking. Incredibly time consuming and especially primitive. Now it is 2016, for God's sake! (127)*.

Some teachers also find LR unstable and do not trust the system. This makes them use alternative strategies to overcome the perceived problems and increases their workload: *The system is not sufficiently stable to be able to trust. You have to always have a back up in the form of information on a blog or something, which implies more work (42).*

For entirely different reasons, several teachers feel that the system is more time consuming than prior work practice. However, there are a few who feel that some of the functionality in the system eases their workload: *If LR was easier to use, I would probably use it more, since I think that it is an advantage both for me and the students to have everything collected in one place. Right now, I feel that the system is both difficult and time-consuming (71). LR collects many different tasks under the same umbrella, but there are all too many steps to go through with clicks and links in order to complete certain elements and feel that it saves time. It does not feel like we are aligning our work to find the most efficient ways but instead are adapting us to existing technology, apps, etc. (80) and I have used LR for almost a year, but it started to take more and more time, so I tried to redirect as much as possible to other platforms (90).*

There are also teachers that find parts of the system to be better than the systems they have used in the past, although they feel that the administrative parts of the system take too long to use: *What has gotten better since we implemented LR is documentation regarding student development. The system is easier than the previous system. On the other hand, I do not feel that the system is any better concerning registering absence, contacts, etc. It still takes as long (93) and I think that the greatest advantages have been communicating with the students and a way to move away from paper that is just lost. I think that there should be a part of LR that could be used for students' practicum instead of paper, e-mail or documentation, which cannot be accessed by colleagues (118).*

Teacher Needs and Interaction

The majority of the teachers have educational requirements related to LR. They want features in LR that enhance their teaching, including features that are based on their needs and their current teaching situation: *Since I used Google Apps before, LR is rigid and difficult to work with when I want to work formatively. As things are now I can now follow the students' creative process, which is very important for me (25) and LR needs to be more efficient. To write assessments and to be able to easily save and see old assessments is a problem. That you cannot decide yourself when assessments are published for a single class is also a big problem (8).*

A very common theme is that the workload for the teachers increased with LR. They feel that administrative tasks take longer time and are more complicated than before. There are several reasons for this, one being that they state that they lack sufficient education and training in the system. Another contributing factor seems to be that teachers feel they do not have control of the system.

Who can provide information about all of the features? Right now, every teacher is sitting and trying by themselves – not a bit time-saving (33), You cannot put a new system in the hands of the people without education in the system (69) and My workload has become much heavier with LR and the feeling of not being in control, knowing if I have missed information, etc. (17).

The statements from the teachers provide a picture of a situation where the teachers themselves are struggling and trying to master the system. Where education, interaction and exchange with others does not happen or is not planned or organized in any significant way. Another difficulty raised by teachers is that everyone has access to the same functionality in LR, regardless of the stage or the subject they teach, or if they have an additional role such as the class mentor, or if they work in multiple schools. *I have to use both LearningRoom and Google Drive because I have private school pupils. This means that the school administration has not been reduced for me (131) and The bad thing was that the platform does not support a different language. It would be very good if you could write in languages other than Swedish directly in the platform (128).*

Social Aspects and Social Technology

A major feature available in the system is the possible to communicate with parents, students and other teachers as well as with school leaders. Unfortunately, this did not work in practice according to the teachers since not everyone uses or checks the system due to various reasons. This was as one of the teachers put it: *Many parents have had problems logging in and they can't log in LR on their phone. Since my students don't have their own computer, I don't communicate with them in LR to any greater extent (10).*

A frequently described problem is the security solution called Bankid, i.e., an identification system that connects through to the users' bank, which was necessary to use in order to access the system. Here, the system is described as hard to use and very secure: *The parents are angry about LR (Bankid for parents who don't even have a computer at home). I do not have contact with school leaders and colleagues in LR, this takes place through e-mail. Before LR, I used Fronter and the contact with the students on the platform has not increased in connection to the change to LR, just the opposite so far (74) and It is too difficult to find LR on the web and to log on with their Bankid. All of our parents do not have a Bankid or knowledge in Swedish, which makes it difficult for them (51).*

For the teachers, this means they must work with parallel systems in order to maintain contact with their students and parents. Something that creates frustration. Contacts with colleagues and parents are mainly handled through e-mail: *Since a logon is needed, with several clicks before you are in LR, it feels easier to use e-mail, Further, e-mail is easier to use on your mobile or your tablet than LR, which is very difficult (55), We have good rooms where we share things, but we lack structure, because there are still things that we do in Drive and in LR, which makes it all confusing (88) and I have used LR for almost a year, but it started to take more and more time, so I tried to redirect as much as possible to other platforms (90).*

As a side effect, the technical problems lead to increased contact with the parents in other channels for some teachers: *The contact with parents has increased, but this is due to parents contacting the school in frustration over how difficult LR is to use. The contact does not take place in LR (52).*

Regarding collaboration, the implemented system LR has not been used for collaboration to any larger extent. Instead, the teachers have kept their current work practice, systems and tools in order to collaborate: *I think that Google Drive is what my colleagues and I use and which facilitates and helps us with administration and collegial development (5).*

The motive to maintain the use of other systems instead of the desired LMS seems to be the lack of functionality in the new system as well as comfort in using well-tested tools that have worked before. The teachers in the survey are not prepared to abandon solutions that they know work in their teaching and in their contacts with parents: *Before LR, we already had a well-functioning blog in Wordpress, which we continue to use to share information and provide information about the students' school day. Here, the possibility to inspire and make things interesting is much greater (6).*

Another recurring theme is the lack of information from school leaders to the teachers in how the new LMS is supposed to be used in the collegium and in fact, how it can be used to facilitate their work: *I have not received any indication that the platform was expected to be used for collaboration between teachers. Not that I can remember (66).*

Discussion

The purpose of this paper is to gain an understanding of how K-12 teachers in a municipality perceived the implementation of an LMS and gain insight into the possibilities and challenges they experienced as end users. Here, teachers who have worked with the system on a day-to-day basis appear to see some possibilities and many challenges with the new LMS. Overall, the hopes that the system would provide a new platform for communication, information and documentation do not appear to have been the result of the implementation. However, for teachers, new systems create new training needs and take time (cf. Håkansson Lindqvist, 2015; Olofsson, et al., 2015; Vrasidas, 2015).

While there appear to be many teachers who have not started to use the system, there are experienced and knowledgeable teachers who are frustrated over the lack of user-friendliness and usability and cannot be seen as barriers (cf. Underwood & Dillon, 2011). These teachers already had found and integrated system solutions to support their pedagogy through other systems (cf. Sipilä, 2014; Tondeur, Cooper & Newhouse, 2010). Overall, the system characteristics appear to be far from teachers' needs in regard to pedagogical use. When implementing LR, the municipality appears to have overlooked the need for a mapping of the existing pedagogical systems in use. It also appears that the municipality may have underestimated teachers' ICT skills and ability to critically evaluate the system. Thus, the implementation of the LMS reflects the many different levels of ICT skills among teachers, different levels of use

and tools (Means, Toyama, Murphy, & Bakia, 2013; Schoonenboom, 2014). It also appears that teachers had found ways to combine different systems for different roles and supporting these roles. It is perhaps somewhat too optimistic to expect one system can support all the many uses by teachers. Further, the instability of the system has involved extra work for many teachers (cf. Lochner et al., 2015).

Collaboration is difficult if there are several or unclear points of access to and dissemination of information. It is difficult for teachers to speak in favor of a system for communication with students and parents, while colleagues and school leaders use an alternative system. It is also difficult to demand that teachers disseminate information through LR if parents do not have access to the system, but still have the need to access the information provided by the teacher. Moreover, the municipality was not aware of the systems that already were in place and in use and frequently used by teachers for pedagogical goals and design, information to students and parents, and collaboration with colleagues (cf. Cheok & Wong, 2015).

The municipality's intentions of one overarching system became perhaps too complex for certain teachers as users and too simplistic for other teachers. This resulted in frustration in both groups, the system itself became a barrier for these teachers to enter and initiate work. For the teachers at the other end, the system became a barrier due to usability issues and frustration regarding being provided with a system that did not provide the same level or better usability compared to the previous systems without gaining efficient work methods (cf. Penuel, 2006; Perrotta, 2013). This is an interesting finding as this shows that many teachers are clearly ICT-competent and have the ability to critically evaluate LR, based on previous use and experience. However, it also supports the idea that many teachers also need time and professional development to take on a new system (cf. Håkansson Lindqvist, 2015; Olofsson, et al., 2015; Vrasidas, 2015).

Regarding collaboration, it appears that the goal of the implementation of increased collaboration was not achieved, according to the teachers. The teachers appear to have found alternative solutions outside the system for contact with students, parents, teachers and school leaders. There appears to be little support for the school leaders as key actors in supporting the implementation of LR (cf. Kampylis & Punie, 2013).

One additional question is of interest to explore. The work in schools as organizations is complex. Thus, it is close at hand to expect that the demands on one system for all of these teaching and learning activities, including information, documentation, assessment, collaborative forums with teachers, internal groups and external groups is perhaps an all too utopian an idea. When implementing a system such as LR, it is perhaps necessary to build upon systems that teachers already have chosen based on pedagogical decisions and design and support this use in practice (cf. Cheok & Wong, 2015). This would include involving teachers, their ideas and thoughts for system use to support and adapt systems. As in this case, one solution for all teachers is perhaps a bit too optimistic; there is a difference in practice between

K and 12 and teachers' needs. A ready system or product implemented from top-down is perhaps the soundest financial solution for the municipality, but as this case shows other approaches could have benefited the user experience.

Finally, in regard to lessons learned, it is important once again to stress the importance of the initial mapping and study of teachers' existing pedagogical practices related to System Characteristics and Social Technology, Teacher Needs and Usability as well as Social Aspects and Interaction before an LMS is implemented. These aspects all appear to be key factors, according to the perspectives of the teachers in this study, if their work with collaboration, documentation and information is to be supported through the implementation of an LMS.

Conclusion

The aim of this paper was to explore the implementation of an LMS in K12 schools in Sweden from the teacher perspective. While the findings are specific for the case studied in the Swedish context, certain findings may be of interest for K12 schools nationally and internationally. First, the implementation, which involved one system for all users from K to 12, appears not to have been able to provide support for specific needs in the different schools' levels. Secondly, the system was implemented according to a top-down decision, which did not consider existing systems and solutions that already were in place and working in teachers' practice. Finally, the technical characteristics in the system appear not to have offered opportunities for different user levels, from novices to experts. In conclusion, the findings in this paper are in line with previous research, stating that the implementation of an LMS takes time, requires professional development and to be successful is best based on needs from the teacher perspective.

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