

HOME-SCHOOL COMMUNICATION THROUGH A WEB-BASED LEARNING MANAGEMENT SYSTEM – EXPERIENCES AND LESSONS

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Abstract

The purpose of this paper is to explore teachers' (N=454) experiences and perceptions with regard to the use of a new web-based learning management system (LS) in home-school communication in Swedish schools. The results indicated a great dissatisfaction with its functional features among the teachers, which negatively impacted the attitudes and beliefs towards the usefulness and ease of use of LS for communication. This in turn prevented teachers' and parents' use of the LS and caused a general decrease in home-school communication in daily practices, especially for those disadvantaged parents.

Keywords: Learning Management System (LMS), Learning Space (LS), implementation process, home-school communication, teacher survey

Introduction

Traditionally, face-to-face, telephone and email contacts between teachers and parents have been the main pathways for home-school communication. Nowadays, almost all K-12 schools in Sweden have an integrated so-called learning management system (LMS) that enables the systematic management of school administration, teaching and learning, as well as internal and external information and communication (Swedish National Agency for Education, 2013). It is argued that the integration of LMS does not only have economic, administrative and pedagogical advantages, but also opens new opportunities for online communication and interaction among school leaders, teachers, students, and parents (Blau & Hameiri, 2010; Cameron & Mahoney, 2008). Previous research in this field mainly emphasised integration of LMS in higher education and provided evidence of advantages and disadvantages of adopting LMS in online learning environments (e.g., Naveh, Pliskin, & Tubin, 2010; Xu, Sakthi, & Kenton, 2014). Research on the application of LMS in compulsory education, especially on the use of LMS in home-school communication and interaction by different stakeholders, is insufficient.

In Sweden, it is up to each municipality to decide on which LMS to use, depending on their economic and infrastructural conditions and other political demands. The implementation processes could also vary from municipality to municipality, and from school to school. In spring 2015, one municipality in Sweden started to implement a new web-based LMS called Learning Space (LS) in all public schools, including all compulsory and upper secondary schools, and in adult education. The goal of this initiative was to provide a single LMS for all public schools in the municipality in order to facilitate the management and communication between schools, as well as to reduce teachers' workload in accordance with policies and regulations for

communication and documentation (Municipality XXX, 2014). To evaluate its implementation process with regard to the teachers' experiences, an online questionnaire was sent to all grade 1-12 teachers in the municipality in March 2016. This study is part of the evaluation project with a special focus on LS use for communication between home and school. The specific research questions are:

1. How do teachers experience and perceive theirs and parents' use of LS for communication between schools and families?
2. What critical variables for integrating LS in home-school communication can be identified and understood?

Literature Review

Parents' access to meaningful and effective communication with schools and teachers is one of the crucial prerequisites for enhancing the home-school relationship and parental involvement. It is the responsibility of schools and teachers to strategically establish, design and carry out communication with families in order to disseminate information, create home-school links and provide opportunities for dialogue (Epstein, 2001; Erikson, 2009). Stringer and Blaik Hourani (2013) found three patterns of home-school communication in their study. *One-way school-to-home communication* disseminates general information to parents on matters of education and school events. *Two-way school-to-home and home-to-school communication* encourages the giving and sharing of information from school and home that is child centered and related to academic and/or behaviour needs. *Three-way school-to-home and home-to-school communication* involves the school, parents and students in decision-making and planning to address individual needs. It calls for a parent-teacher-student interaction model that involves all stakeholders.

Web-based School Management System and Online Interaction with Parents

The utilisation of technology through the use of web-based communication with parents is growing rapidly as an additional link for the home-school relationship. The concept of e-communication is adopted to stress the advantages of using modern technology to increase a school's effectiveness through databased decision-making and instant interactions among different stakeholders (Blau & Presser, 2013). During the last few decades, using emails to send information about school and class activities, teaching and learning resources and management, and students' behaviour and outcomes has been the dominate means to communicate with families. Recently, the integration of a web-based LMS in K-12 schools has become an important tool for facilitating instruction, assessment, administration, and to provide new possibilities for online interaction among school leaders, teachers, students, and parents (Blau & Hameiri, 2010; Xu et al., 2014). Some studies provide evidence of significant positive correlations between the use of LMS and pedagogical effectiveness, school cultural change, and parental involvement (Blau & Presser, 2013; Davidovitch & Yavich, 2015). Other research, however, indicates that the presence of LMS in schools does not automatically ensure its effective use by staff, students and parents, and that the application of this system must be explored and examined, as Wayman, Jimerson and Cho

(2010) argue. Moreover, LMS also includes functions for parental use. Parents are a heterogeneous group with different language, socioeconomic and educational backgrounds that influences the levels of their accessibility to web-based information and communication, and their ability to utilise technical and digital resources (Gu, 2017). With regard to the implementation of LMS, this challenge could lead to the exclusion of disadvantaged families in home-school communication.

Implementing Technological Change in Schools

The adoption of technology in education is a complex issue related to different levels of implementation such as at the system and policy levels, organisational level, and individual level. It also includes technical and human aspects. Strategic and operational policies at the national and municipal levels allow for a common vision with regard to significant expenditures, which are required for employing technological change in educational settings, and may enable these visions to be realised through action plans, programmes or projects (Gu, 2011). At the organisational level, new culture and e-leadership are regarded as necessary for implementing technological changes at schools (Avidov-Unger & Eshet-Alkalai, 2011; Chamakiotis & Pantell, 2011).

Research indicates that teachers' perceptions of their school as a learning organisation that emphasises cooperation and collaborative learning among staff affects their readiness to be active actors in integrating innovative technologies (Levin & Fullan, 2008; Zimmerman, 2006). At the individual level, teachers' digital competence differs and is crucial for the uptake and use of technology in teaching. However, despite teachers' proficiency in using information technology, it does not mean that they believe it is a valuable tool when used in educational settings (Steel, 2009).

Studies indicate that teachers' attitudes towards change, their contextual pedagogical and technological knowledge, and their perceptions of school as a learning organisation are three of the most important factors affecting successful implementation of change in general and innovative technologies in particular (Kontoghiorghes, Awbre, & Feurig, 2005; Sandy, 2010). According to Halverson and Smith (2009) and Harris and Hofer (2009), teachers' resistance to change with regard to technology is mainly because it does not fit their pedagogical practices and beliefs.

Approach for Analysis

To evaluate and analyse the implementation and use of LMS in schools, the Utilization of LMS framework developed by Asiri, Mahmud, Abu-Bakar and Ayub (2012), which is based on the Theory of Reasoned Action (TRA) (Ajzen & Madden, 1986) and Technology Acceptance Model (TAM) (Davis, 1986), has been adapted, developed and applied. This framework aims to identify and explain critical factors that influence the utilisation of instructional technology. According to the framework, the utilisation level of LMS depends on some important internal, external and demographical variables. There are three components in the category of internal variables. Firstly, implementation of technology in an educational setting depends strongly upon the users' attitudes towards the new technology. If the users have a positive attitude towards LMS,

they are more likely to be motivated to use it (Lochner, Conrad, & Graham, 2015; Yang & Yoo, 2004). Secondly, educators' beliefs and predictions towards the usefulness and ease of use of technology influence their specific technology integration in educational practices (Cheok & Wong, 2015; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). Thirdly, teachers' technological experiences, skills and competencies are crucial elements that affect their integration of technology in educational practices (Ball & Levy, 2008). External variables refer to the environments and conditions that play a key role in the adoption of technology in educational settings. Organisational factors refer to different aspects such as leadership, collective expectations, visions, philosophy, and values (Perrotta, 2013) that determine the strategies and arrangements for technology integration. Technological features regard the functional aspects of LMS that influence the user in terms of accessibility, usability and relevance (Althobaiti & Mayhew, 2016). Pedagogical, administrative and technological support, training and professional development contribute significantly to the success of technology implementation (Kampylis & Punie, 2013). Social circumstance is an extensive concept. In this study, the focus is on social conditions relevant to the teachers' work, as well as political contexts for technology implementation. Demographic features such as gender, age and professional background and computer experiences may also serve as antecedents that determine the technology use (Vekiri & Chronaki, 2008)¹.

Research Design

In spring 2015, the web-based LMS Learning Space was implemented in all public schools in one municipality in Sweden. To evaluate the implementation process, and to investigate teachers' experiences of the application of LS, an online questionnaire was sent to grades 1-12 teachers in all public schools in the municipality in March 2016.

Participants and Attrition

During 2015 and 2016, the total population of teachers in all 1-12 public schools in that municipality was around 800² (Swedish National Agency for Education, 2017). Four hundred sixty-eight teachers responded to the questionnaire, in which 14 questionnaires were not completed (internal attrition). Four hundred fifty-four teachers (N=454) participated in this study with an approximate response rate of 57%. While participation in the web-based survey was voluntary and anonymous, and there were no incentives to participate, the response rate was quite high (Lefever, Dal, & Matthíasdóttir, 2007).

Instrument

The online questionnaire consisted of three main categories and 15 sub-categories with a total of 71 items in forms of questions or statements. The three main categories include teachers' background information, teachers' perceptions on generic LMS-related experiences and capability, and teachers' perceptions on the use of LS. In the last mentioned category, three sub-categories were applied: 1) LS use for school administration; 2) LS use for teaching/learning and; and 3) LS use for contact/communication with school leaders, colleagues, students, and parents. The questionnaire also provided

free text fields where participants could provide comments. The questionnaire combined single/multiple choice, rating scales, and free text fields for teachers' comments.

Data Collection and Analysis

This paper aims to describe and discuss the teachers' experiences and perceptions on the use of LS in communicating and interacting with parents. Thus, data used in this paper were selected according to the relevance to the topic, in other words teachers' perceptions with regard to if LS facilitates communication with parents and their perception of the outcomes of parental contact and communication through LS. In order to provide context information, teachers' background information in terms of their professional experiences and their LMS-related experiences and capability, including information about the duration of their LS use, are included. Both quantitative and qualitative data were represented. Descriptive statistics were adopted to present the quantitative data in the form of bar graphs showing the numbers of teachers in the different defined groups.

In order to forge a deeper understanding of teachers' perspectives, teachers' comments on their use of LS in communication with parents and their perceptions of parental use were used as part of the empirical data. After the first reading of all comments (N=617), the comments from general experience of LMS use and school-related communication through LS were regarded as relevant (N=302) for further reading and selection. At the next stage, after a more careful reading, 34 comments from general experiences of LMS use, and 77 comments from contact/communication through LS were selected as the qualitative database for analysis (N=111 totally). The length of comments varies from a few words to longer paragraphs; for instance the longest comment consisted of 263 words. Data from free text comments in the questionnaire were analysed by adapting the systematic process of developing codes and themes in relation to the research objectives that involved an integrated process of reading, understanding, interpreting, and reflecting as Hjerm and Lindgren (2011) suggested. The teachers' comments provided us with richer and more contextual information that supported identifying, illustrating and understanding the tendencies emerging in the quantitative data (Kvale & Brinkmann, 2009).

Data was analysed according to the Utilization of LMS framework (Asiri et al., 2012). Three themes relevant for internal variables and four themes dealing with external variables were identified. Internal variables included attitudes towards the use of LS, beliefs towards the usefulness and ease of use of LS, and experiences and generic competence of using technology. External features referred to technical functions, organisational culture, instructions and support, and social and political circumstances for implementation. The demographic variables described in this study intended to provide background information of the teachers' group in general. In other words, no specific measurement of correlations between demographic variables and the utilisation of LS were carried out.

Findings

This section presents the main findings related to the research questions. Firstly, teachers' background in terms of their self-reports on levels of ability of using LMS, as well as duration of LS use, are presented. Secondly, teachers' experiences of their own use of LS in communicating with parents and their perceptions of parental use of LMS in communication with the school are outlined. Thirdly, critical factors for integrating LS in home-school communication are highlighted.

Teachers' Backgrounds

The following graphs show the demographic features of teachers' backgrounds with regard to professional experiences and self-assessment of technological competence. Figure 1 indicates that most of the participants were experienced professional teachers: 73% of the participants had worked as teachers for more than 10 years. Almost 96% of teachers reported that their ability to use LMS (such as First Class, Fronter, and LS) was at average or above average levels, in which 58% even had a high or very high level capability in handling LMS (see Figure 2).

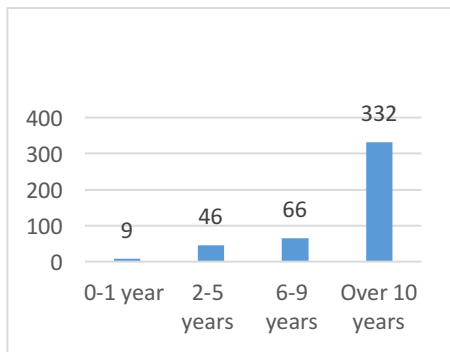


Figure 1. Professional experience (N=453).

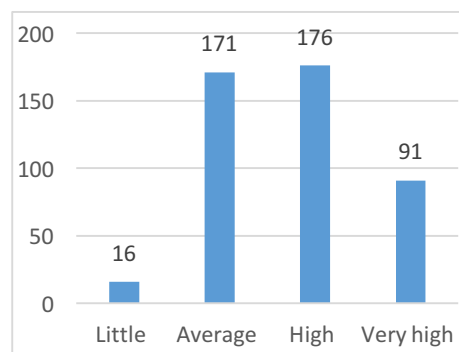


Figure 2. Self-assessment of the ability to use LMS (N=454).

In the teacher group, only about 47 % of the teachers had experience using LS for more than six months (see Figure 3).

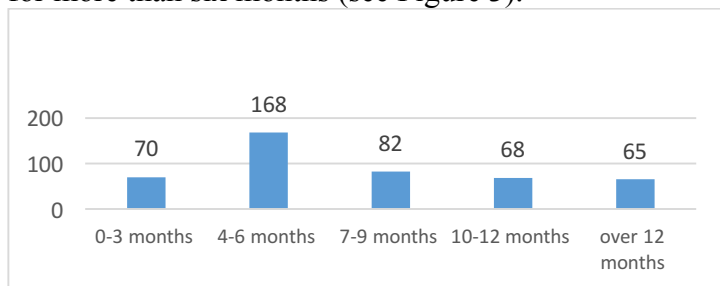


Figure 3. Duration of the use of LS (N=453).

LS Use in Communication between Home and School

Implementation of LS was to provide teachers with a unified and structured system that benefits the effectiveness of their work in terms of teaching, learning, administration, and communication. In the field of communication with home through LS, the focus has been on teachers' experiences of their own use and their perceptions of parental use.

Teachers’ use of LS in communication with parents. The teachers reported that LS was used mainly in sharing teaching materials and documents in some shared spaces/rooms for classes, school and staff. Many teachers also used LS for reporting students’ ratings and other assessment documents. However, it had been more difficult to find a logical communication solution with others through LS, including parents. A number of teachers pointed out that even school principals seldom used LS, ultimately preferring to send information and messages to teachers through Microsoft Outlook.

Information sharing and message exchange are two important features in communication with parents. However, the communicative functions in LS did not work as well as expected: “There are many who are not happy with the message function in LS. Missing, for example, is the possibility to get an overview of the messages, send messages to multiple recipients, as well as attach files.” Some teachers pointed out that parents complained that they could not get any messages sent by the teacher via LS. Thus, for many teachers the dominate manner to communicate with colleagues and parents was still by Outlook.

When answering the question if they perceive that LS facilitates communication with parents, the majority of the teachers gave negative responses, in which 68% of them disagreed with the statement or agreed with the statement at a low level. Only 11% agreed with this statement at a high or very high level (see Figure 4). Teachers’ dissatisfaction with LS use in contacting with parents was obvious.

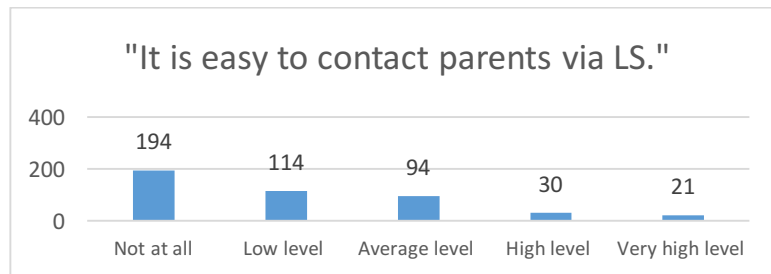


Figure 4. Levels of agreement with the statement, “It is easy to contact parents via LS” (N=453).

Perceived parental use of LS in home-school communication. Parents’ possibility to access the system is even more important. A number of teachers reported that they were supposed to post weekly letters to parents on LS, but they were very unsure that all parents had access to LS and read the letters. This was mainly because the system required a bank ID to log in, but not all parents had this ID, and they might not know how to apply for and use an e-ID, especially those with other language and cultural backgrounds. One teacher said: “Parents generally find that LS is decent, messy and complicated. The fact that you have to log in with e-ID to get information was a mistake. This barrier causes significantly fewer parents to read the weekly letter compared to when emailing the information.”

Difficulties accessing LS and lack of information and knowledge on how to use the system seemed to be the main barriers for parents to communicate with teachers via LS. Some teachers also felt responsible to teach parents about the system so that they would not miss information from the school. One explained:

Many students and parents are unsure how to handle/use LS. It contributes to an increased workload for me when I am expected to teach LS to students and parents. It has made me stressed. I wonder where in my profession I will be responsible for parents understanding and using LS? ... I get angry that I need to take time off my teaching to keep up with LS.

Critical Variables for Integrating LS in Home-School Communication

Accessibility and ease of use are the most important features when integrating a new technology into educational practice. However, as one person noted, "This program requires so many button clicks to complete simple things that you almost forget what you intended to do from the beginning." Another example was the login system, as it first asks for an ID to log in to LS, and then different rooms within LS may require additional login processes. For a number of teachers, the implementation of LS increased their workload in terms of time consumption when dealing with technical difficulties, and they were forced to use two systems due to the message function problem in LS, which was the opposite intention of the municipality when it implemented the project. Some comments even had a very negative tone, which to some degree reflected the disappointment of not only the technical weakness of LS but also the top-down implementation process:

... LS is a disaster in its harshness and inexcusability and in its lack of intuitiveness. That since the IT office in its wisdom forced us to change the website to only contact outward (who has the use of a school website????), no children or parents get updates on homework and examinations anymore. There is no single forum for a parent to go in and see a compilation of homework and tests in a week. All parents have said they miss the old system of homework on the website. XXX usually defends LS in the media about the fact that it was developed by the "30 most knowledgeable teachers in the municipality." What she NEVER says is that they got three wretched systems to choose from, of which LS was the least bad. Talk about putting your head in the sand!

Lack of instruction and training to apply LS, both for staff and parents, were also mentioned by some teachers:

[I] have not learned to use all functions of LS. There have been too few learning opportunities and that the instructions on how to use LS are still just headlines. There is no content. Would look at an instructional video that the municipality refers to but it was so bad quality that it could not be heard or see the instruction. Have missed some of our hits when it comes to learning LS. Is hard to take again. Colleagues are busy with their own work. Need more support to get started properly.

Table 1 outlines a summary of teachers' descriptions that deal with external variables affecting their own and parental use of LS.

Table 1

Teachers' Perceptions of External Factors that Prevent Their Own and Parental Use of LS

External Variables	Teacher Use	Parent Use
Organisational factors	<ul style="list-style-type: none"> • Principals and colleagues do not prefer to use LS to communicate with each other • Lack of encouragement and challenge from school leaders • Using different LMS in parallel, which resulted in heavier workload 	<ul style="list-style-type: none"> • Lack of information about LS implementation
Technical features	<ul style="list-style-type: none"> • Demands many clicks and many log in steps to reach the place they want • No function to attach documents in the mail system in LS • No function to send a message to both parents at the same time 	<ul style="list-style-type: none"> • No other options but bank e-ID to log in • Problem to log in to LS via cell phones • No notice when a new message in LS is received • Cannot receive messages if they have not linked their email addresses to LS • Unable to reply to messages via LS
Support and training	<ul style="list-style-type: none"> • Lack of knowledge on how to use LS and all of its functions • Lack of introduction and further training • Responsibility to handle the difficulties at individual teachers' level 	<ul style="list-style-type: none"> • Lack of knowledge on how to use LS • No organised training and introduction to LS
Social circumstances	<ul style="list-style-type: none"> • Social pressure • Top-down initiative and implementation process 	<ul style="list-style-type: none"> • Some parents have difficulty with the Swedish language that prevented them from using LS, which is only in Swedish • Not all parents have access to computers, Internet, smart phones, and e-ID

Logically, these difficulties could have prevented home-school communication from both sides. Teachers gave very negative answers to the question on whether communication with parents had increased after the implementation of LS. Almost 87% disagreed with the statement or agreed with it at a low level. Only 4% of teachers gave positive responses, as displayed in Figure 5.

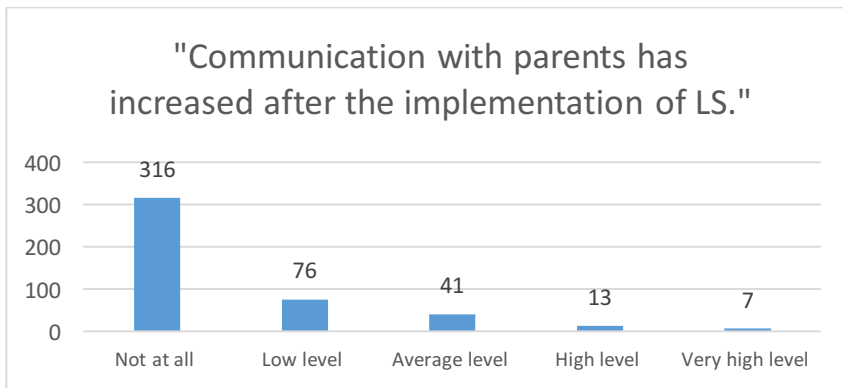


Figure 5. Levels of agreement with the statement, “Communication with parents has increased after implementation of LS” (N=453).

More ironically, some teachers reported that contact with parents increased, but the reason was due to “improper absences reports entered in LS [by parents], which must be retrospectively corrected,” and therefore “[parents] contact the school in frustration at how difficult LS is to use. The contact does not occur via LS.”

Discussion and Conclusions

By adopting the Utilization of LMS framework (Asiri et al., 2012) to analyse the results, we are able to identify and understand some critical internal and external variables that influence the actual and perceived use of instructional technology by teachers and parents for home-school communication and how these variables relate to and affect each other.

The findings reveal that the majority of teachers are experienced professionals and have a high level of self-confidence in IT-related abilities and capabilities, including LMS experience (internal factors). Although there are new functions within LS that teachers need to learn and become familiar with, their existing generic content and pedagogical knowledge, and their digital competence would have benefited them in adopting the new LMS (Harris, Mishra, & Koehler, 2009). In this respect, the teachers’ more negative perceptions and attitudes towards LS use might be related to the technical and functional shortcomings of the system (external factors) that do not fit their educational beliefs in terms of pedagogical effectiveness, parental involvement and school cultural change (Blau & Presser, 2013; Davidovitch & Yavich, 2015; Halverson & Smith, 2009; Harris & Hofer, 2009). This could have influenced their attitudes and educational practice in a negative way, which prevented their engagement and opportunities to quickly update relevant information in the system. All of which deteriorated the information flow to parents and weakened the one-way school-to-home communication (Stringer & Balik Hourani, 2013). With regard to parents’ use of LS, the problem with access and other difficulties have also prevented their use when contacting and communicating with schools. According to Stringer and Balik Hourani, for parents who were unable to join the system in order to receive information and to provide direct feedback and comments, their effective involvement in their children’s schooling through two-way or three-way communication was challenged. Contact between home and school therefore decreased since the

implementation of LS. This indicates that the LS implementation project's intention — which aimed to effectively involve all stakeholders in schools through a single learning platform — has not reached the expected result.

There could be other factors that affect the level of teachers' satisfaction and the effective use of the system. For instance, teachers' attitude towards change plays an important role in the implementation process (internal factors). According to Del Val and Fuentes (2003), attitude towards change can be divided into two aspects: behavioural/cognitive and emotional. The result of this study supports their assumption. In the teachers' responses we are able to identify these two groups of attitudes, both of which are a form of resistance. Some teachers focused on comparing the new system with the older systems they previously used and tried to identify and describe the weakness of the new LS and even provide suggestions for improvement (behavioural/cognitive attitudes). Another group of teachers mainly expressed their anger and dissatisfaction (emotional attitudes).

Implementation of a new educational technology is a complex process, and it needs time. Georgouli, Skalkidis and Guerreiro (2008) suggest that the use of new technologies is similar to the application of new educational models that need to be supported by systematic redesign of the processes at both the institutional and individual educator levels. Implementing a new technology in an organisation requires developing an organisational learning culture that helps to maintain transfer of knowledge, creativity, flexibility, and support, in which cooperation and collaborative learning within the organisation are regarded as the characteristic elements (Collinson, 2010; Weldy & Gillis, 2010). Teachers' negative experiences of the use of LS could be related to the top-down implementation process they experienced, which left little room for their input and negotiation in the decision-making process (Selwyn, Banaji, Hadjithoma-Garstka, & Clark, 2011). At the organisational level, lack of positive attitudes and collective approaches towards integrating LS in school management was evidenced by teachers' descriptions of the similar negative experiences of principals and other colleagues who chose not to use LS but rather Microsoft Outlook to communicate with each other. Teachers also expressed that even with the lack of information and introduction on LS use, schools and the municipality did not seem to intend to provide further training opportunities and support for teachers and parents' effective use of LS. These provided some evidence of external barriers at social/political and organisational levels to the integration of LS (Asiri et al., 2012).

Another external barrier for parental use perceived by teachers was the fact that LS did not benefit disadvantaged parents who had no or little access to and knowledge about hardware and software that the system demanded. In other words, they were excluded from the system, which, it could be said, is based on the norms and conditions of well-educated middle-class families and parents. Parents who are more comfortable speaking with teachers, and have the time, education, knowledge of school culture, and competence in dealing with technology, can take advantage of the use of LS. Consequently, their cultural dominance (*habitus*) through access and use of communication with schools in many ways provides privilege for their children. The gap between children from middle- and lower-class families could thus be extended (Reay,

Crozier, & James, 2011). This is a challenge for the system developer and the municipality to work out other alternative solutions. Parents, especially those who are disadvantaged, should have the opportunities and support to receive necessary instruction and training to learn more about the system and to have easier access to it.

This study provides evidence of some critical prerequisites for successful implementation of innovative technologies in schools. Implementation involves far more than a mechanical application of goals and initiatives into routine procedures and actions. A successful implementation of technology in schools calls for policy commitment, quality features in technical design, sufficient organisational support, and positive personal attitudes and efforts. As we have learnt that central policies or reforms do not automatically lead to practical changes in schools, the top-down initiatives should follow a greater attention to local conditions to ensure a successful implementation of policies (Gu, 2011). School policies and plans, resources, leadership, and a collaborative team of teachers could positively relate to the implementation of new technologies in schools. In the technical respect, the compatibility of the system, transparency/information, interactivity, accessibility, and usability are crucial (Gu, 2017; Parajuli, 2007). LMS must be evaluated and developed in order for different stakeholders to easily use it. The municipality and its schools should provide technology-related training and support to help teachers and parents develop their digital competencies and skills for integrating technology in education and in home-school cooperation. The design and functions of LMS should consider disadvantaged users such as parents from other cultures with limited knowledge of the language and computers. Individual teachers' understandings, interpretations, attitudes, and efforts also play important roles in this process.

Notes

1. It must be noted that this study is based on teachers' self-reports and perceived parental use of LS, which means that it could differ from their actual use or the actual level of utilisation of LS.
2. This number was not exactly the number stated in the Swedish Agency for Education's database (2016) in order to protect the identity of the municipality.

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