



UNIVERSITY OF GOTHENBURG

Students' perceptions of learning management systems

**An explorative case study of upper secondary school
students**

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Abstract

IT has for a time been a part of the everyday life in schools. Learning management (LMS) system is intended to help students by facilitating learning and communication. While the systems employ a variety of functions and benefits they also present challenges to the individual student. Results from prior research indicate that these systems are often underutilised or unable to deliver desired effects by failing to comply with the user's expectations and needs. The purpose of this study was to gain insights into how learning management systems are perceived by students in upper secondary school. Ten students were interviewed to identify factors influencing student perceptions of LMS. Our findings indicated that student's perceptions are affected by sociological and technological factors. Yet, despite the system limitations, students can adopt the system if it can correspond with the student's unique learning expectancies.

The study is written in English.

Keywords: Student perceptions, learning management system, LMS, E-learning, upper secondary school

Thank you

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1. Introduction

1.1 Background

Information and communication technology (ICT) is increasingly becoming a bigger and more important part of students' everyday life (Lonn & Teasley, 2009). With the help of ICT students and teachers can more easily handle assignments and communicate across time and space (Chen, 2011). A significant trend in schools has been to implement so called learning management systems (LMS), which are used as a common platform where students and teachers can interact digitally.

While the learning management systems are intended to facilitate learning and communication at the level of the individual student, they also present challenges. For example, if a system does not match users' expectations and needs, there is a risk that the system will be underutilized or fail to improve organizational processes (Szajna & Scamell, 1993). Further, if a student perceives a system too difficult to use, the student might find other systems more appealing (Davis, 1989). However, even if a system is easy to use it does not guarantee that the users are satisfied with the system (Davis, 1989). In general, a system needs to fulfil the complex requirements of the users for them to perform their current tasks (Venkatesh & Davis, 2000; Davis, 1989). This reflects an inherent tension or mismatch between what the user needs and what existing technological systems provide.

Learning Management Systems are E-learning systems, and are often described interchangeably as Virtual Learning Environments (VLE), Knowledge Management Systems (KMS) and Content Management Systems (CMS) (Moore, Dickson-Deane, Galyen, 2011). An LMS provides students and teachers with a set of tools for improving the learning process and its management, and functions as a support in the traditional classroom education as well as in distance education (Stantchev et al., 2014; Al-Busaidi, 2011). Electronic learning (E-learning) is a broad term used interchangeably with other terms, such as online education, and distance learning (Moore et al., 2011). E-learning is defined as the use of internet to access learning content and resources, interacting with instructors and other students, in order to gain knowledge (Ferrer & Alfonso, 2011).

1.2 Problem area

According to Garcia-Peñalvo (2011), E-learning is risky in many ways, especially since the students' needs are taken less into consideration. Others have pointed out that systems used in learning are not utilized to their full potential (e.g. Chen, 2011). In this light of this, it is of great importance to develop a better understanding of how to improve learning management systems. Above all, it is key to gather information about students' perception regarding their effectiveness to support their learning.

The motivation for carrying out this study emanates from our own experiences of using the learning management system (GUL) at the University of Gothenburg in Sweden. Our main concern is that while the system provides a lot of functionality including tools for communicating with teachers and other students, assignment management, calendars, file sharing and more - all common functions of an LMS. It does not appear to meet the students' needs and expectations. The result is that the system is underutilised and in many cases ignored by the students. Another obstacle is inconsistent use by the teachers at the institution, which sometimes causes confusion and misunderstandings.

The growing use of E-learning in schools internationally has been followed by increasing amounts of academic research including both teacher and student perspectives (e.g. Baskerville, 2012; Pombo, Smith, Abelha et al., 2012; Stantchev et al., 2014). Much of this research is quantitative in nature and tends to focus on university level education (e.g. Al-Busaidi, 2012, 2013; Al-Busaidi & Al-Shihi, 2011; Chen, 2011).

Lei (2010) writes that many studies focus on the impact of the quantity of technology use, such as how much or how frequently technology is used, but ignore the qualitative aspect of technology use. According to Lei (2010), various researches suggest that the quality of technology use is more critical to student outcomes than the quantity. Few studies focus on younger students' perceptions of LMS use, and therefore the knowledge regarding their experiences and attitudes towards LMS is limited. This piece of research aims to contribute to filling this knowledge gap.

1.3 Research question

To be able to take the students' perspective into consideration we need to ask ourselves how the students perceive learning management systems (LMS). By capturing the

students' perspectives it is possible to develop appropriate knowledge as a basis to improve the design and implementation of such systems. Following this, the main research question, which has guided the research is:

What are students' perceptions of learning management systems?

By investigating the students' perceptions the research is intended to capture a number of factors that influence and explain why the students perceive an LMS in a certain way.

1.4 Delimitations

This study focuses on investigating upper secondary school students between the ages of 15 to 19 at one educational institution in Gothenburg, Sweden. In addition, the research scope was limited to honing in on the student users' perceptions of learning management systems.

1.5 Thesis overview

The rest of the thesis is organised in the following chapters. Chapter two describes the relevant concepts and related research connected to this study area. Chapter three presents the methodology of the study and the how the empirical data will be collected. Chapter four describes the results of the analysis and interpretation of the data and summarises the findings. Chapter five provides a discussion of the main findings in light of the theoretical concepts presented in chapter two as well as outlines the main contribution of the study. Chapter six presents the main conclusions and provides suggestions for future research.

2. Related research

In this section we introduce relevant concepts and related research connected to users' technology acceptance and the factors related to acceptance of E-learning systems. This literature is key to understand how technology may be perceived by users.

2.1 Previous research related to E-learning acceptance

In this section research describing the social and technical factors affecting the use of E-learning systems is presented.

2.1.1 E-learning and learner's characteristics

It is evident from previous research that the characteristics of the learner have a significant effect on E-learning acceptance (Al-Busaidi, 2012; Selim, 2007; Sun et al., 2008). According to Al-Busaidi (2012), factors such as learner's computer anxiety, technology experience, and personal innovativeness to use new technologies have significant effect on the learner's perception regarding the use of LMS. As the learner feels comfortable using computers and has technological experience it becomes easier for the user to accept an LMS (Al-Busaidi, 2012; Selim, 2007). However, research also shows that the anxiety of using E-learning technologies can hinder the learner's satisfaction (Sun et al., 2008; Selim, 2007; Al-Busaidi, 2012). This means that learners need support to build confidence in using computers and LMS in E-learning (Sun et al., 2008; Al-Busaidi, 2012).

Al-Busaidi (2012) concludes that the more technology experience a student has, the easier it is for the student to utilise IT in education. In other words, long-term use of IT affects a student's perception of seeing IT as a beneficial tool (Al-Busaidi, 2012).

2.1.2 E-learning and the social characteristics

In addition to learner's characteristics, the instructor's influence is stated as a significant indicator in learner's E-learning acceptance (Al-Busaidi, 2012; Selim, 2007; Sun et al., 2008). Specifically, instructors' attitude toward the LMS and their control over LMS are significant factors affecting learners' perceived ease of use, as well as the actual use of the system (Al-Busaidi, 2012; Sun et al., 2008). According to Sun et al. (2008), instructors that are less enthusiastic or have a negative view of E-learning are likely to decrease learner's satisfaction and motivation. This suggests that educational institutions need to ensure that instructors are fully on board regarding the use of LMS (Al-Busaidi,

2012). Yet another factor that has been cited in the literature concerns influence from classmates and their effect on learner's perceived ease of use and satisfaction with LMS (Al-Busaidi, 2012).

2.1.3 Learning management system characteristics

In addition to learner's characteristics and social influences, system quality and information quality have significant effect on user's satisfaction of LMS (Al-Busaidi, 2012; Eom, 2012). System qualities are the characteristics of a system and can be measured as response time, reliability, flexibility, ease of use, and ease of access, well-organised design and personalisation (Al-Busaidi, 2012; Ozkan & Koseler, 2009; Selim, 2007). Information quality is defined as the learner's perceived output produced by the system (Al-Busaidi, 2012). Information qualities consist of school timetables, teaching materials, and discussion forums, which all must be properly prepared to ensure user satisfaction (Sun et al., 2008).

According to Ozkan and Koseler (2009), learners prefer content that is not only up-to-date but also well-organised, clearly presented, interactive and useful. For example, necessary announcements that are done on time enable the learners to feel more comfortable with the course content, which results in higher satisfaction rates (Ozkan & Koseler, 2009).

Previous research also suggests that support to learners receive is a significant indicator for E-learning acceptance (Al-Busaidi, 2012; Selim, 2007). In line with this, A-Busaidi (2012) suggests that good training to students in the use of LMS is critical, not the least because good service quality enables learners to understand the system.

Garcia-Peñalvo et al. (2011) argue that learning management systems often fail to produce the expected results. This is due to faulty use of the LMS, their inhibiting effect on collaboration and that use often focus more on the needs of the institution and courses instead of the student. Their research suggest that in order to come to terms with this complex of problems, learning management system needs to open up for integration and support other systems (Garcia-Peñalvo et al., 2011). This means that an LMS system quality needs to be improved to be able to deliver desired results.

2.2 Theoretical models

As our research question concentrates on the students' perceptions and use of LMS, we have decided to introduce research that examines the aspects affecting users' acceptance of technologies. To be able to understand why a student perceives a system in a certain way, we need to be able to understand the origins of their views. By understanding the factors affecting user acceptance we can uncover the reasons to their perceptions.

Various theoretical models have been used in research to describe and measure users' technology acceptance. In this section we present the following models: technology acceptance model (TAM) created by Davis et al. (1989), extended technology acceptance model (TAM2) created by Venkatesh and Davis (2000). Further, a model that extends the previous models is presented.

According to Al-Busaidi (2012) users' satisfaction and acceptance of LMS are important elements for its survival. This means that if students perceive the used LMS system unsatisfactory and do not accept it, they will not continue using the system. Sun et al. (2008) support this view by adding that the students' initial perceived satisfaction with E-learning systems will determine whether they will use the system continually or not.

2.2.1 Technology acceptance model (TAM)

The technology acceptance model (TAM) created by Davis, Bagozzi and Warshaw (1989) focuses on the variables affecting users' satisfaction in technology use (see figure 2.1). The TAM, and variations of it, aims to understand the underlying factors affecting users' technology acceptance of systems, such as LMS (e.g. Padilla-Meléndez et al., 2008; Saadé, 2007). By understanding the effects of the variables, such as system features and user characteristics, it can be determined whether a system is accepted or rejected by a user (Davis, 1993). TAM is used to theorise that the behavioural intention of an individual to use a system is determined by two main factors: perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1993).

Perceived usefulness is defined as 'the degree to which a person believes that using a particular system would enhance his or her job performance' (Davis, 1989, p. 320). In the context of E-learning, perceived usefulness is defined as the perception of how user sees improvement in learning effects through the adoption of an E-learning system (Sun et al., 2008).

Perceived ease of use on the other hand is defined as: ‘the degree to which a person believes that using a particular system would be free of effort’ (Davis, 1989, p. 320). This means that if a user subjectively sees a system as easy to use, the user is more willing to continue using that system (ibid). In the context of E-learning, perceived ease to use can be described as the ease a user feels for adopting an E-learning system, and therefore PEU has a significant relationship with E-learner satisfaction (Sun et al, 2008).

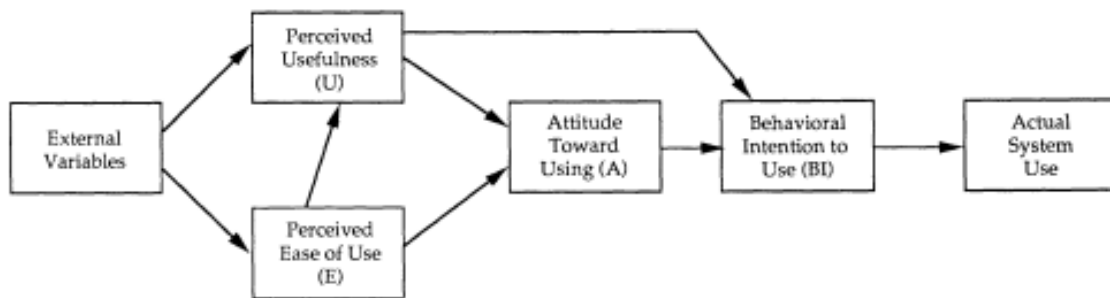


Figure 2.1 Technology acceptance model. (Davis, Bagozzi & Warshaw, 1989, p. 985)

Once the system is perceived to be easier to use compared to another, it is more likely to be accepted by the users (Davis, 1989). However, a system that is easy to use, but lacks in functionality, might not be seen attractive from the users’ perspective (Ibid). In brief, users can cope with some difficulty in use of the system, as long as it provides the essential functions that are needed by the user (Ibid).

This can also be applied to E-learning (Saadé, 2007; Al-Busaidi, 2012; Al-Busaidi, 2013). For example, systems that are easy to use and provide the functions that can contribute to learning, is more likely to allow the user to concentrate on using the system for learning rather than spending effort on trying to learn how to use the system (Saadé, 2007).

2.2.2 The extended technology acceptance model (TAM2)

Venkatesh and Davis (2000) extended the TAM to consider the effects of social influences and cognitive processes in acceptance, which they found lacking in the original model (see figure 2.2). They argue that social influences are formed by subjective norm, voluntariness, and image. Further, cognitive processes are formed of job relevance, output quality, result demonstrability and perceived ease of use (Venkatesh & Davis, 2000). Each of these factors is briefly described for the purpose of clarity and importance to the field in general.

Subject norm refers to the perceptions of the user to take opinions of other people into consideration when determining whether to use a system or not (Venkatesh & Davis, 2000). For example, some users may start using a system based on social behaviour, even if they themselves do not have a favourable opinion toward the system. Moreover, people can change the opinions of another person and motivate that person to use a system (Venkatesh & Davis, 2000).

Voluntariness refers to the user's perception to how mandatory or optional the system is to use of the decision to use a system is mandatory or optional (Venkatesh & Davis, 2000). A mandatory use of system can affect the use intentions, as some users do not want to comply to such mandates (ibid). If organizations mandate the use of a specific system it can have an effect on the users and their willingness to comply with the mandate (Venkatesh & Davis, 2000).

Image refers to part of the social influences, and is defined as the image a person or a group can acquire from the use of a certain system. Venkatesh & Davis (2000) write that the use of a system that is deemed acceptable in a social group can improve the social image of a user, and that in turn can elevate the social standing of that person within the group. This can lead to an elevated feeling of power, which can give the person a greater sense of productivity, and a sense that using a system will lead to improvements in job performance indirectly due to image enhancement (Venkatesh & Davis, 2000).

Experience refers to the knowledge the user has of the system. According to Venkatesh and Davis (2000), users base their initial experience of a system on their expectancies and rely on opinions of others as a basis for their intentions for the system use. The effects of subjective norm become less influential after the user gains more experience with the system (Venkatesh & Davis, 2000). Experience greatly affects user's perceived usefulness of a system. As one continues to use a system, the gained experiences can improve usefulness (Venkatesh & Davis, 2000).

Job relevance refers to the user's perception whether the system is applicable for the the tasks at hand (Venkatesh & Davis, 2000). Output quality refers to how users assess the expected outcome from performing tasks with a system, and whether the tasks match the job relevance for the user (Venkatesh & Davis, 2000).

Results demonstrability refers to the perceived results from using a system, which directly influences perceived usefulness. When users perceive that they gain positive results from using a system, they will more likely continue using the system. However, if a system produces results that were desired by a user, but does so in an obscure fashion, it can affect the perceived usefulness of the system (Venkatesh & Davis, 2000).

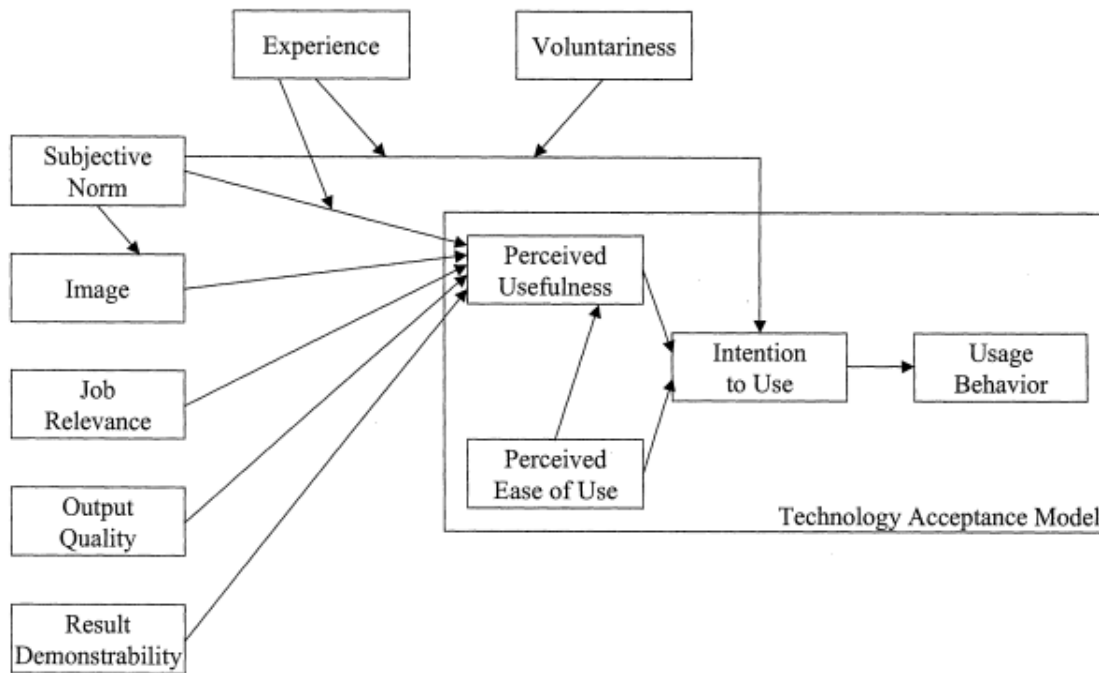


Figure 2.2 The TAM2 model (Venkatesh & Davis, 2000, p. 188).

2.2.3. Extension to previous user acceptance models

Chen (2011) extended the presented models to be more adaptable to measure user acceptance in E-learning. According to Chen (2011), the models do not take E-learning, and learning in general, into consideration when studying the user of acceptance. Similarly to behaviour in IT usage, E-learning is motivated by various beliefs of the user, which affects learners' behaviour for learning (Chen, 2011). This means that a student's motivation for using an E-learning system is quite different from using generic IT (Ibid).

According to Chen (2011), students' educational compatibility and technological expectancies affect the student's intention to use E-learning technology. Educational compatibility describes how a student sees the possibilities of the system as being accordant with the unique learning expectancies of the student. E-learning systems that possess higher educational compatibility are believed to effectively facilitate the learning

processes of students and improve learning performance. Educational compatibility plays a consequential role on student's decision to accept or reject an E-learning system (Ibid).

User acceptance is determined by the behavioural intention of users, which in turn is motivated by user expectancies (Chen, 2011). Student's expectancies of an E-learning technology are affected by the student's characteristics, social influences and easiness to use. Further, the student's expectancy of existing organisational and technical infrastructure to support the learning influences the user's E-learning acceptance (Chen, 2011).

3. Method

To answer our research question we decided to apply a case study approach based on semi-structured interviews. The strengths of using the qualitative case study approach are that it enables researcher to get to the core of what is ‘going on’ in the problem area. Further, it is useful in terms of understanding a real world setting in terms of providing insights into events, actions and actors concerned (Troost, 2010; Cornford & Smithson, 2006; Patel & Davidson, 2010).

Put differently, case study research is an in-depth exploration of one situation limited in time (Cornford & Smithson, 2006). This also means that a better understanding of the situation is gained the more time is spent in a case study setting. Limitations to the case study approach are related to the difficulty of locating causality and the lack of control of individual variables. For example, generalisation cannot be done from a single case study, but this can be solved by applying additional researches in form of case studies that strengthen and validate the data (Cornford & Smithson, 2006).

Similar to what Walsham (1995) suggests for case study research, we have attempted to include details of the research setting, the number of people interviewed, their hierarchical or professional position, additional data sources, and over what period the research was conducted.

3.1 Case study setting

The study was conducted at an upper secondary school in Gothenburg, Sweden, and is hereafter referred to as “The School”. We selected this particular school because they were planning to conduct an implementation process to replace their current LMS. The need to change their current LMS hinted of potential underlying issues with the current LMS, which made this school more interesting to us than the other candidates. The School is owned and run by an educational corporate group that administers several educational operations within Sweden. It has a little over 500 students, with ages ranging between 16 and 19, and offers programmes within science, social science, business administration and music.

The system used as a case study object is named First Class and has been in use in The School for several years. The School has plans to replace First Class with a system from

another vendor. At the time of the study, the implementation had not started and was only in planning phase. In 2011 First Class was one of the three most used LMS in Sweden (Szekely, 2011).

First Class is a learning management system which allows users to create groups and folders, which they can individually share with each other. This allows users to decide themselves how they share group assignments to each other, without needing a teacher or other person to administer folder sharing. Some of the functions and features of First Class consist of messaging, blogging, calendar, email, and file and content sharing, communities, and personal web publishing.

3.3 Data collection

Interviews were selected as the main data gathering method for this study, as interviews offers the researcher a chance to explore various topics in depth (Cornford & Smithson, 2006). Another benefit of using interviews is that they allow positive interaction between the interviewer and the interviewee. For example, if there is any misunderstanding with questions or explanations, they can be clarified to the interviewee (Cornford & Smithson, 2006).

Ten semi-structured interviews were conducted during a regular school day. Initially the aim was to interview students from different programs and grades, however due to pragmatic reasons this was not possible. The interviewees were chosen at random with the help of a student counsellor and later by our own initiative. The random selection of students resulted in a predominance of students from the social science program, as they, at that day, had more gaps between classes and were accessible for interviewing.

The interviews were partly carried out in The School's cafeteria and partly in a student common area. This way the interviews could be executed in a location familiar to the students. Negative aspects to this were the external factors distracting the interviews, which might have affected the outcome of some of the answers. A separate isolated room might have been preferred to avoid distractions and outside influences, but due to the circumstances during the interviews, this was not a possibility.

Before each interview started, all interviewees were introduced to the purpose of the study and reassured about the confidentiality (Walsham, 2006). Each interview took approximately 10-15 minutes and was recorded. In addition to using a recording device, pen and paper were used to take additional notes. By taking notes it helped us to ensure the validity of the answers, and to secure that the interview could continue if the recording was not successful due to technical faults. Some of the recordings had extensive background noise as the interviews were performed in relatively noisy areas. In those cases, where noise made the recordings unclear, notes helped us to ensure that the answers were correctly interpreted.

3.3.1 Interview guide

An interview guide was created to ensure that the same topics were covered in each interview (see appendix 1 for an interview guide in English and appendix 2 for an interview guide in Swedish). Themes and questions were generated by consulting earlier research regarding teachers attitudes towards LMS (Rudbeck & Östling, 2009), critical success factors for user satisfaction in E-learning (Sun et al., 2008) and learners' perceived critical success factors to LMS (Al-Busaidi, 2012). We acknowledge the potential problems of using theory as a basis for a guide, as it can create a situation where the researcher is only seeing what the theory suggests (Walsham 2006). We also had to pay attention to the way we formulated the questions as the interviewees were young and did not necessarily understand some technological terms and the scientific language.

The interview guide was divided into the following themes:

- **Background and information about the interviewee**
The questions in this part were 'ice-breaking' questions aimed to gather a general background data of the interviewee and their role.
- **Computer experience and LMS experience**
This part was designed to yield descriptions of the interviewee's computer skills and their experience with LMS.
- **Perceived benefits and disadvantages of LMS**
The questions in this part were aimed to yield descriptions of the interviewee's perceptions of the LMS in terms of their benefits and disadvantages.
- **Use of learning management systems in general**
It was also important to ask questions related to the interviewee's experience of other system that they have used in other educational contexts.

As a final question each interviewee was asked to add further comments related to the LMS.

3.4 Data analysis

All interviews were conducted in Swedish and transcribed in the Swedish language. Quotations from the interviews were translated in to English. The translations were conducted to mirror the original meaning in the Swedish language, but we recognize the challenges of translation and the possibility that some nuances in expressions be lost.

The data analysis was done by following the principles of thematic analysis (Braun & Clarke, 2012). It is a systematic way of analysing qualitative data and to find commonalities across data sets. Commonly the process of conducting a thematic analysis consists of six phases (see figure 3.1) that are used to find codes and eventually themes. This helps the researcher to find collective or shared meanings and experiences (Braun & Clarke, 2012). This analytical process allowed us to identify themes and patterns in our interview material that were relevant to answer the study's research question. It enabled us to create a firm foundation for the data interpretation.

During the first phase we transcribed the data from the interviews. In the second phase, the transcribed material was coded. By reviewing the text and searching for the underlying meaning of excerpts of the transcription we could identify different codes. The following phases involved an iterative process where we searched for patterns in the codes that could be used for themes. These themes were reviewed and then finally defined and named. A good amount of time was spent on the theme identification to avoid common analysis problems, such as inadequate analysis of data and incomplete definition of themes (Braun & Clarke, 2012).

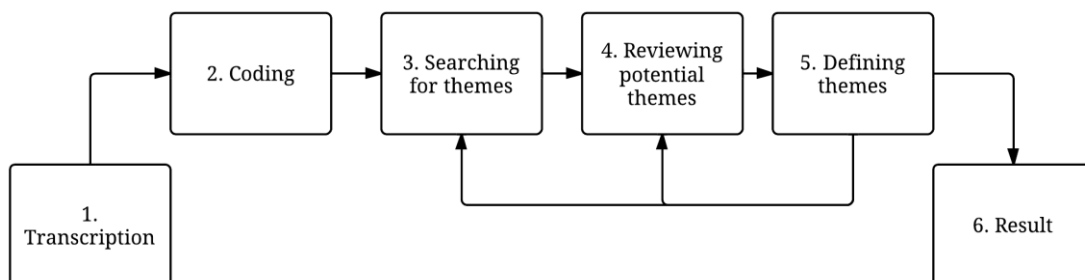


Figure 3.1 An illustration of the thematic data analysis

3.5 Credibility of the study

In qualitative research validity usually builds on how the researcher checks for the accuracy of the findings, by employing certain procedures displaying trustworthiness, authenticity and credibility (Creswell, 2009). In order to do so, researchers need to clarify the potential bias in the research (Creswell 2009). We acknowledge our potential bias in view of earlier experiences with learning management systems. We see the effect of this bias as nominal as our experiences is with a single system, and the criticism related to it, do not necessarily correlate to other systems.

To ensure the validity of this study we attempted to design an interview guide which we both followed in our respective interviewing sessions. That way, although we could not control each interview situation, we could make sure that we covered the main topics. In addition, the interviews were recorded and notes were taken to ensure the integrity of the data.

During the interviews we tried to minimise potential interviewer effects. Esaiasson et al. (2012) define this as three different effects, intentional influencing, unintentional influencing and adjustment from the interviewee. The first effect, intentional influencing, is when the interviewer intentionally influences the interviewee to get the answers he or she want. According to Esaiasson et al. (2012), to conduct an interview such a way is unprofessional and a researcher should remain objective to the study. For this reason, we tried to ensure an objective approach with honesty and auditing.

Other potential issue we had to consider was unintentional influencing during the interview. As it is exemplified by Esaiasson et al. (2012), the use of gestures, facial expressions, selective note taking and listening, the interviewer can unintentionally direct and influence the interview. Due to our lack of experience with interviews, we were not able to completely prevent this kind of influencing, but by knowledge and awareness we tried to lessen these effects' impact.

The interviewee might also adjust the answers to the interviewer, the interviewee adjustment effect. The visual traits of the interviewer, such as age, gender and ethnicity can influence the interviewee to give the answers that he or she thinks the interviewer wants to hear. This effect is hard to counteract, but can be mitigated by the use of interviewers with different traits and appearances (Esaiasson et al., 2012). In view of the

conditions for this study no substantial measures could be taken to counteract this effect, but a neutral appearance as possible was chosen during the interviews.

4. Results

Our analysis and coding resulted in five main themes, which are: facilitating communication, incomplete system use, cluttered and challenging design, instructor influence, and content quality. Table 4.1 summarises the main themes and its definition. These themes will be described one by one in this chapter, and linked to our findings from the interviews.

Theme	Description
Facilitating communication	Reflects to the perceived usefulness of the system as a digital communication tool.
Incomplete system use	Signifies that the LMS is perceived as a tool with a few isolated functions, not as the 'multi tool' the system is designed to be.
Cluttered and challenging design	Refers to the perceived difficulty to use the system.
Instructor influence	Refers to the perceived social influence from the instructors.
Content quality	Refers to the perceived information quality of the system.

Table 4.1 Themes and their definitions

4.1 Facilitating communication

Facilitating communication reflects to the perceived usefulness of the system as a digital communication tool. One of the most recurring themes in the analysis denotes to learning management systems and its main uses. It is clear that the students' use, view and, thus, perceive the system as a tool for communication and handling assignments. Communication occurs mainly via the system's mail function and through a news board. All of the respondents felt that the system is important for communication with instructors and other students. Students also valued the importance of being able to send group work and deliver assignments to instructors through the LMS. The respondents felt that this as an important part of the teacher-student communication. As expressed by one of the respondents:

"-It [the system] has a positive effect by letting you turn in schoolwork to the teachers without having to hand in a paper copy in class. You get more time for writing assignments. It's easy to send

the teachers questions when you're away on leave and can't ask in person in school. In that way it helps, other than that it doesn't affect much, since it isn't being used all the time, only when I need to send an e-mail or so."

Most of the dissatisfaction with the system relates to communicating through the system. For example, some respondents had problems with the actual use of the system, which in turn affected their ability and interest to use news boards and e-mail. As the communication tools were felt burdensome it affected how the system was eventually used.

Most of the respondents reported that they use the system both at home and at school. This allows the students to communicate in different time and space. Many respondents reported that they use mobile devices to access the LMS. This way they can be up to date with the current news and information from the instructors and students alike. One of the respondents exemplifies this by saying:

"-Well, it's very easy to access, so sometimes you end up sitting on Christmas or new year's eve and checking, is there anything new."

As a result of this constant accessibility one respondent reported a worry regarding the need to constantly look out for new information. The respondent felt that it was necessary to regularly check whether new information had been uploaded to the LMS's news board or whether there were any new emails. The respondent compared this behaviour to the 'Facebook-syndrome', because the availability from the mobile device made the respondent constantly check for new updates. One of the respondents illustrates this by stating that:

"-...it felt a bit like you used it too often, and then there was an e-mail that you didn't want to read at that time, but you still felt that you needed to press it, so that i don't have lots of unread e-mails... Some [students] have like 500 unread mails in their mailbox."

Students use external systems as well as First Class to communicate with each other. Most of the respondents acknowledged the importance of having a communication tool

in the school, but they rather preferred using other systems, such as Skype and Facebook, for student-student communication. Students had created private Facebook groups, to which only students had access.

4.2 Incomplete system use

Incomplete system use signifies that the LMS is perceived as a tool with a few isolated functions, not as the ‘multi tool’ the system is designed to be. Most of the respondents reported that the current learning management system was mainly used for one purpose only: to handle the communications between the teachers/the school and the students. Additionally the students used the system to find basic information regarding their schoolwork, for instance looking up their school timetable or assignment details, a few students also used it to share information while doing group assignment. Even though the LMS offered more functionality, the perception of it was as a tool for communication. As one respondent expressed it when talking about why the school implemented the system:

“-It’s there to make it easier for students and teachers to communicate”

Some of the students conveyed an understanding of how the system had more functionality than what was being used, but they had not tried them. A majority of the system’s different functions were not mentioned during the interviews. The use of functions was illustrated by a respondent:

“-It feels like, well it’s obvious, if you look at it [the system], it seems to have a lot more than what it’s being used for. If you’re on the startup page, there is about 10 different folders and menus, I use at the most 3 of them, if even that”

4.3 Cluttered and challenging design

This theme refers to the perceived difficulty to use the system due to cluttered and challenging design. Even though most respondents perceived the LMS as easy to use, they also expressed grievances to the system design. Thus, the inability to find information in a quick and efficient way was a recurring topic during the interviews. For example, unsatisfying file structure, limited search capabilities and unclear instructions

caused annoyance and a general feel of an outdated system. Often the students found themselves having to go through an excessive amount of steps to reach the information they sought. As expressed by one of the respondents:

“-Sometime it can be a bit complicated to find things... Where is it now? You need to find the timetable and these other course related things, you have to enter lots of tabs all the time... ...so it can be a bit hard to find things sometime. You have to go a long way”

Another recurring remark from the respondents regarded the many unused buttons and functions; these were regarded as clutter and as a source of confusion. The students only used a small part of the buttons and functions available and wanted a more direct and “cleaner” look of the system. The students wanted a more modern design where the functions they used had a more prominent spacing and where information was easier to access. The following citation from a respondent exemplifies the issue:

“-It feels like, like there isn't so much, because there is so much extra stuff everywhere, some patterns here, some colours there. It should be more pure, clean and it should be easier to get to stuff”

Many of the respondents felt irritation from the constant need to remove emails from the mailbox within the LMS due to the limited space available to the students. The respondents felt that they had to spend excessive amount of time to keep the mailbox clean of unnecessary emails, and expressed difficulties deciding which emails to keep and not to keep. Some respondents reported that the first activity they do when they login to the system is to start cleaning the mailbox. This caused irritation amongst the respondents, because they had to frequently go through this process of manually deleting the emails. The irritation is illustrated by a respondent:

“-Well, the point is this, if there is some material, let's say a pdf-file or something, then they do like this, they send it, and then everybody have to have it in their bloody inbox. And if you don't want 3000 mails, I want to be able to find where I keep stuff, then I have to delete, and then it happens that you remove stuff that shows, one month later, that we needed. Well, then you're toast.”

Another respondent expressed a fear of making mistakes during the manual mailbox cleansing. The respondent told of a story that circulated within the school of someone accidentally emptying the whole mailbox. The respondent could not explain how the other students had managed to do that. The respondent laughed while explaining this, but it became obvious that the fear of losing information limited the respondent's system use.

4.4 Instructor influence

This theme refers to the perceived social influence from the instructors. Many respondents expressed that the instructors actively encourage the students to use the system. For example, instructors expect students to turn in assignments through the system and want the students to login to the system often to look for new information. Most of the respondents perceived that the instructors showed a positive attitude towards the use of the system, and that the instructors felt that the system is needed for communication. When describing instructors attitude towards the system, one respondent painted a picture of how the instructors saw the need for the communication even if they did not like the system itself. As one of the respondents expressed it:

"...the teachers' attitude is like ours, it's a necessary mean, maybe even a necessary evil."

The functions used by the students were the same as the functions that was encouraged by the instructor, showing a great deal of influence from the instructors on the students. In addition, one respondent felt that some of the instructors displayed resistance towards the LMS. For example, some instructors prefer to print assignments on paper instead of providing students with the information through the LMS. On the other hand one student perceived overconfidence in the system from some of the instructors. The student explained how some instructors used the system to 'drop' information and material on the students without properly instructing them on how to use it. This was exemplified by one of the respondents through a fictional conversation between a student and an instructor:

"-The teacher: '-But I e-mailed that to you.' The student: '-But you haven't talked anything about it, so we still don't get it'"

When it comes to instructors' knowledge with the system, one of the respondents strongly expressed that instructors lack the knowledge to use the system properly. This respondent expressed that there is a generation-gap between the students and the instructors. The respondent felt that the instructors, that belongs to an older generation, as they do not possess the same skills and knowledge of ICT as the younger generation. A respondent expressed the thoughts in the following manner:

“-The youngest teacher is about 40 years old, so the system suits them just fine, ‘log in, check mail, and send mail’, but when you’re not from the same age as we are, maybe it’s like that, it suits them better.”

Another respondent explained how instructors place information in different locations. For instance, students expect to find certain information at a specific location, due to how the LMS is most commonly used, but some instructors prefers to use different locations instead. This can make it difficult for the students to find the correct information.

4.5 Content quality

Content quality refers to the perceived information quality of the system. This regards the perception of how relevant the information within the system is to the student, and the perceived easiness to find the correct information. Many of the respondents reported that they felt that they receive important information through the system, but at the same time much irrelevant information. Some of the respondents liked that the different student organizations were able to send out information about their activities within the system, while others did not. As one of the respondents shared his experience of other students' view of on the information within the system:

“-And I have heard some say ‘ -Ahh, I don’t feel like reading that e-mail, or that e-mail, and that group sends like 1000 e-mails.’”

One respondent expressed a worry of missing important notifications due to the fact that too much irrelevant information was posted. The student meant that when the system is

flooded with information that is not relevant, people stop looking. The respondent explained it in the following manner:

“...for example this thing with the news board, let’s say we’re going skating, first of all, it [the system] doesn’t show there is new news, you have to go in and take a look, is there any news? Yes there is, we’re going skating, but then it flags for a new notification since the music teacher has posted ‘my sandwich is missing’, and then people stop looking, and you miss things.”

As mentioned in the previous section, instructor influence, students have expressed difficulties finding desired information as a result of inconsistent use by the instructors, effectively decreasing the content quality.

5. Discussion

This study set out to investigate how students perceive the use of learning management systems. The major findings from the results show that students' perception of the LMS is affected by a number of factors related to social influences, perceived easiness to use and perceived usefulness. In addition, factors such as the actual system and content qualities are also important to whether students' embrace a system or not. It is clear from the results that the perceptions reflect issues that are both technical and social in nature, which in many ways supports previous research on user acceptance of technology. In the following sections the main findings are discussed, critical reflections are presented and suggestions for further studies are provided. The chapter ends with conclusions.

The ability to easily communicate was identified as an important factor in students' perception of LMS. In this study, the easiness to communicate with the other users influenced the students' perceptions of how the system was perceived as a useful communication tool. Earlier studies have shown the importance of perceived usefulness affecting the system use (Davis, 1989). The need for a way to communicate and the system facilitating this need makes the student perceived the system as useful, resulting in the students accepting the system. This means that an LMS needs to fill one or more needed functions as shown in earlier research, for example Venkatesh and Davis (2000). With this in mind, IT-professionals working in upper secondary schools need to take the students' needs into consideration when choosing and implementing an LMS. To successfully implement an LMS, one of the most important factors is that it has an educational compatibility (Chen, 2011). In our case study this is signified by the way the learning management platform facilitated the need for a digital way to communicate. How to best facilitate communication remains a challenge for teachers, students and system developers.

Similar finding from our study is that social influences seem to have a great impact on the students' perceptions, as they are affected by social norms that dictate that certain kind of communication should exist in certain systems. The effect of social influence affecting the use of the systems is also highlighted in previous research (Chen, 2011; Venkatesh & Davis, 2000). The results showed that the students actively use other systems for communication as well as the LMS. This could be explained by social influence and that the students' use of other means of communication due to social

influence can be hard to remedy. Further, the likeliness of an LMS to completely take over the student to student communication from a social media such as Facebook is hard to envision. This can also be transferred to other potential functions of an LMS, for instance cloud services and collaborative platforms. To meet these challenges, integration and support for other systems could be the key. To do this would increase the usefulness of learning management platforms, but could also create an environment that bridges the gap between the personal informal system use, and the more formal educational use (Garcia-Peñalvo et al., 2011).

One particularly interesting finding was that students' propensity to embrace learning management systems very much relates to having teachers who know how to use the system; and in a sense leads the student to use it. The teachers are part of the social influence and therefore affect how students are likely to perceive the system useful. According to Venkatesh and Davis (2000) social influences affect how the user accepts the system, which correlates well to our study. The way the teachers talk about the system and the way they use it has a strong impact on the students, both positively and negatively. To take advantage of the strong influence the teachers hold, the IT-professionals in education should make sure to educate the teachers on the system they implement. By doing so, the teachers will have a better understanding of how to use the system and hopefully understand why it is beneficial to them. This would result in a more positive attitude towards the system and a greater use of functionality from the teachers, which would reflect over on the students and their perception of the systems and their system use.

Further findings indicate that the teacher's way of using the system is major source of influence on how students perceive and use an LMS. The functionality that is encouraged by the teachers is the functionality that is being used. In other words the students, to an extent, perceive the system as mandatory to use (Venkatesh & Davis, 2000). The instructors also influences the students in a social context, if critique and resistance towards the system is conveyed to the students, this will have an impact on their perception of the system. By educating the teachers regarding the system use gives the possibility to strongly influence the students' perception and use of the LMS.

Our study also emphasises the importance of the learning management system delivering quality content to its users. The content quality relates to the information quality and the

distribution of information, and it directly affects students' perception of an LMS. Earlier studies have shown the importance of an LMS having information that is up-to-date, easily available and relevant (Al-Busaidi, 2012; Ozkan & Koseler, 2009). To uphold a continuous and fruitful system use, it is important to keep the information quality at a high level and in the right place. The students often felt that the system contained a lot of unnecessary information or displayed frustration over the inconsistency in how it was published. The relevancy of the information can be difficult to achieve as LMS users can consist of different groups of people, such as teachers, students, administrators and other school personnel. These groups also need to be trained in how to publish information and what to publish. Alternatively, the system developers need to improve the design of the systems so that it becomes more intuitive for information handling.

The study also identifies the importance to have a clear and efficient system design, in order to affect students' perceptions of an LMS in a positive way. Although, the design flaws of a learning management system do not necessarily stop the users from accepting it if the system can match their educational need, i.e. it has educational compatibility (Chen, 2011). The perceived flaws in the system design affect the system's accessibility and ease of use, which are common measures of system quality (Al Busaidi, 2012; Ozkan & Koseler 2009; Selim, 2007). System quality did play a role in how students perceived the system, as they often expressed a view of the system as unnecessarily complicated and a bit old fashioned. This ties in well with Al-Busaidi's (2012) findings that suggested that insufficient system qualities can affect the perceived ease of use and the user satisfaction, which in the end can affect the continuous use of the system. This implicates that system developers may need to pay more attention to the design of learning management systems, such as the visual design and the system functionality.

The overall results from our study indicate that the students perceive learning management systems as something that is beneficial, and they are quick to complement the shortcomings of the system by adopting other systems to fulfil their educational needs. Our study also points towards a view of learning management systems as being mainly communication tools. Further, our study shares a lot of similarities with prior research, and with the knowledge on system acceptance in the fields of E-learning and information systems. However, the findings from our study point to a stronger influence of the instructors, in this case the teachers, in the context of upper secondary school. In addition, what emerged as particularly relevant was that a learning management system

needs to fulfil one or more needs to be embraced by the students. Additionally, an important interpretation is that students can perceive a system as useful despite the system's drawbacks.

6. Conclusion

The main contribution of this study is that it has provided some important insights into the factors that may affect upper secondary school students' propensity to embrace learning management system (LMS). There is currently little research conducted within this type of LMS setting. Indeed, finding out what the students' perceptions on system are can help IT-professionals within education and system developers to improve the design as well as implementation processes.

Based on the study results we conclude that the most important finding is that, the students' perceptions of a learning management system is mainly influenced by how the system correlates with their educational needs and expectations. Thus, if it has the 'right' functionality students are likely to accept the system. Conversely, if the system does not provide the needed functions, the users will turn to using other systems instead. This means that IT-professionals within education need to make sure that the functionality of an LMS corresponds with the students' needs.

Another major conclusion is that the teacher or any other professional, who is in charge with leading students to use a learning management system, has a key role in influencing their perceptions and use.

We also conclude that the system design has an impact on the students' perception of an LMS. The system should be designed with regards to the systems ease of use and accessibility. The students of today are digital natives and the systems need to meet their standards. Therefore E-learning systems must comply with the design-standards of today.

As a final point it is clear that there is scope to conduct more studies investigating user perception and acceptance of technology in the educational sector and beyond.

6.1 Critical reflections and suggestions for future studies

Is it possible to generalise the study findings to other upper secondary schools in Sweden? While case study research is ideal to develop in-depth knowledge and insights about one particular study setting, it does not automatically mean it reflects a general view of students' perception of learning management systems. That said we believe that the findings are valid in terms of showing a number of important factors that help to

understand what may affect students' attitudes and use of such systems. From this perspective, our study findings provide a valid contribution to research and practice and impetus for future research.

Future studies could investigate multiple educational settings, including a number of different learning management systems to develop and modify the findings from our study. In terms of research methods, future studies could also complement interviews with actual observations of the students' use of LMS. This could provide more nuanced finding in terms of user experience.

We also suggest that future studies on user acceptance could place more emphasis on investigating the IT-needs of students in upper secondary school. As the needs of the students play a vital role in system acceptance, such research could help system developers to advance learning management systems to the next level. This could provide IT-professionals within the educational field get a better 'feel' for what kind of functionality is important to students.

During this study we observed that students appeared somewhat anxious or 'stressed' as a result of being constantly online; i.e. connected to the school. We noted that some students might have a problem of disconnecting (being offline), an inability to separate the time spent on education and time spent on leisure. In light of this, more research should be focused on understanding the implications of ICT on students' health.

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Appendix 1 – Interview guide in English

Background

- What orientation do you study?
- What grade are you in?
- What are your interests, favourite subjects in school?

Computer skills

- How would you describe your computer skill?
- What do you use computers for in school?
- What do you use computers for at home?
- How long have you been using the schools LMS?
- Have you gotten any education on the school platform?

Learning Management Platform

Platform usage

- How do you use the school platform, describe how you use it?
- Is there any difference in how you use the platform in school and when you are at home?
- How is the platform being used in your tutoring?
- Are there any functions you feel are missing in the platform?

Perceived platform

- How do you perceive the platform?
- How is it to find information and functions in the platform?
- How does the platform affect your daily school work?
- Are you getting the support you need to use the platform

- Does the platform comply with your requirements?

Platform, other

- What would you like a Learning Management platform to look like?
- Why do you think the school acquired an LMS?
- How do you perceive the teachers attitudes towards the platform?
- How do you perceive other students' attitudes toward the platform?
- How would you like Learning Management Platforms to look like in the future?

Round up

- How do you communicate with other students and teachers about your school work?
- What other program/tools do you use in your school work and why?
- Is there anything else, that hasn't been brought up, that you want to talk about?

Appendix 2 – Interview guide in Swedish

Bakgrund

- Vilken linje går du?
- Vilken årskurs går du i?
- Vad har du för intressen, favoritämnen i skolan?

Datorvana

- Hur skulle du beskriva din datorvana?
- Vad använder du datorn till i skolan?
- Vad använder du datorn till i hemma?
- Hur länge har du använt skolans lärplattform?
- Har du fått någon utbildning på skolans lärplattform? (vem, hur)

Lärplattform

Användande lärplattform

- Hur använder du skolans lärplattform, beskriv hur du använder det? (syfte, vartifrån, funktioner)
- Är det någon skillnad i hur du använder systemet i skolan mot när du inte är i skolan? (funktioner, vartifrån)
- Hur används lärplattformen i undervisningen?
- Är det några funktioner du saknar i lärplattformen?

Uppfattning Lärplattform

- Hur upplever du lärplattformen?
- Hur är det att hitta information och funktioner i lärplattformen?
- Hur påverkar lärplattformen ditt dagliga skolarbete?
- Får du det stöd du behöver för att använda dig av plattformen? (vem, hur)
- Uppfyller lärplattformen dina krav?

Övrigt Lärplattform

- Hur skulle du vilja att en lärplattform såg ut?
- Varför tror du att skolan har skaffat en lärplattform?

- Hur uppfattar du lärarnas inställning till lärplattformen?
- Hur uppfattar du andra studenters uppfattning av lärplattformen?
- Hur skulle du vilja att lärplattformar ser ut i framtiden?

Avslutande

- Hur kommunicerar du med andra elever eller lärare om ditt skolarbete?
- Vad använder du för övriga program/verktyg i ditt skolarbete och varför?
- Är det något mer du vill ta upp som inte har framkommit?