Learning Management Systems (LMS)

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Master Thesis in Informatics

Learning Management Systems (LMS)

Case study on an implementation of an LMS and its perceived effects on teachers.

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Abstract

Learning Management Systems (LMS) is a widespread information system used in many Higher Education Institutes (HEI) in order to facilitate educational efforts. The system can be used for support in campus courses; courses conducted on the Internet and of course a mixture of these usages. This study attempts to understand the process of the implementing an LMS at a specific HEI. The HEI has made several implementations over the last 6 years, but decided to implement a new LMS during 2018. The focus of the study is the perceived effects on teachers in the implementation and the role a group of so-called Ambassadors played in the implementation.

The study applied a social constructivist approach, mixing interviews, observation and survey as methods for data collection from teachers and implementation project management at the HEI. The study applied thematic analysis in order to analyse the collected data. The analysis built on five themes, Ambassadors, Implementation, Major concerns, Pedagogy, and System Literacy. Findings suggest that time management issues created the major effect on the daily work of teachers and that the group of Ambassadors in their role acted as a form of change agents, thus influencing the implementation project positively. Findings also suggested that only a few teachers took the opportunity to apply new pedagogical features to their teaching, in connection with the implementation. Finally, findings suggested that, in line with previous research, that the LMS is not used fully, as some teachers tends to use only minor functionalities in the LMS.

Keywords: Learning management Systems (LMS), pedagogy, change agents, project management, thematic analysis

Acknowledgements

“If you can’t fly, then run.

If you can’t run, then walk.

If you can’t walk, then crawl;

but whatever you do,

you have to keep moving forward.”

Apparently, Martin Luther King has expressed these words. I chose to reuse them for several reasons. Firstly because my life journey the last five years have been long and sometimes strenuous. My studies started more than seven years ago at the Linnaeus University and today I am on the finishing line. Secondly because my life journey over these years can be illustrated just like this, sometimes I was flying, on other occasions I was barely crawling, but I was always on the move, trying to move forward.

This thesis has been challenging, but with the help of some people, I have been able to follow through. My thanks go to the following joint travellers on this journey towards the finishing line.

First, I would like to express my thanks to my supervisor, David Randall, for all the support and positive feedback that I have received, especially now at the end.

I would like to say “Thank you” to the classmates that have been giving me constructive feedback on various seminars during the course.

I would like to say “Thank you” to the Dean of the Faculty of Business, for the opportunity to complete my studies.

I would like to send all my colleagues at Högskolan Kristianstad a very big THANK YOU for participating in my study. I would not have been able to do it without you!

I also want to thank my colleagues at Faculty of Business for their support during this journey. The patience and willingness to listen to and discuss all the questions I encountered, I appreciate very much.

At last, I would like to send a “Thank You” to myself. It has been a journey with many obstacles, but I am grateful that I did seized the opportunity and did not give up, thus making me fulfil a dream, based on lifelong learning.

Kristianstad January 27, 2019

Torsten Andersson

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1. Introduction

1.1 Introduction and Research setting

In 2016, NORDUnet started a procurement process with the ambition to establish a framework agreement for Learning Management Systems (LMS), to use by all of the partners from the Nordic National Research and Education Networks (Procurement, NORDUnet, 2016). The procurement process ended in 2017 and based on their recommendation of a preferred supplier, several Swedish higher education institutions (HEI) have signed a Letter of Intent to the Swedish SUNET, indicating that they have the intention to use the preferred LMS hosted by SUNET. Among them is Kristianstad University (HKR). HKR has approximately 330 teachers that give around 400 courses, both online and in classroom, with up to circa 12 000 students each year (Högskolan Kristianstad, 2018).

HKR has implemented several LMS systems during the last 6 years whereof the latest implementation took place in 2014. All courses given at HKR uses this LMS and most teachers appears to be comfortable when using it. However, in 2016, HKR decided to implement a new LMS and the project joined forces with the NORDUnet procurement project. This decision led to the start of a new project for the actual implementation of the new LMS during 2017-2018.

As many of the teachers have taken part in such a transition between LMS´s at HKR either in 2014 and/or earlier or at other HEI, the project as such raises a number of questions. Questions like “Why are we changing again?”, “How will I be able to use this new tool?”, “How will the implementation affect my daily work and work-life balance?”, and “what kind of effects on my teaching will this new LMS have?” are natural questions that a teacher might have. From a project management perspective, questions like “how do we make sure that this project is successful?”, “how do we plan all the training needed?”, “what is the best approach to the change that is needed?” are valid questions. The new LMS will be associated with ‘constraints’ and ‘affordances’ (Norman 1999; Leonardi 2011) and thereby influence the implementation.

1.2 Purpose Statement and Research Questions

There are a number of LMS available for use in HEI and substantial research on LMS from various perspectives has taken place. The main theme for this research is the implementation of an LMS and its perceived effect on teachers in a higher education institution (HEI). It will study the implementation project from two perspectives, one being the project management and another being the teachers at HKR. As such, it treats the implementation as being a socio-technical and organizational matter rather than purely technical one.

When an organisation initiates a change, a number of concerns arise. The users need to, among other things, understand why the change is initiated, what the change is and how it will affect their daily work (Kotter, 1996). These general concerns also apply to the introduction of an LMS. In the discussion of how the LMS will work, the question of how to conduct teaching with the help of LMS is valid. In some cases, probably for historical reasons, a HEI could use more than one LMS in parallel, which could impose a constraint to the teacher’s ability to use the various LMS in an effective way in regards to teaching.

As this study will be conducted by studying a single object (or phenomena), i.e. the implementation project of an LMS at a specific organisation within a certain time it might be considered to be a case study (Hart, 2005). More specifically, it enables us to get some general sense of the relationship between the technology, the practices of pedagogues and the management of the change process.

Wise & Quealy (2006) state the following:

> *It is presumed that LMS will transform university teaching from the outdated traditional university teaching model based around passive transfer of content to a privileged few into a broadly accessible student-centred, interactive learning model based around learning networks, interactive and collaborative technologies and communities of practice. So long as universities support LMS and elearning initiatives, it is assumed to be self-evident that innovation, change and broadbased access to higher education will follow (Wise & Quealy, 2006, p. 899).*

However, there is not enough support for this presumption (Wise & Quealy, 2006). The focus on technical aspects of an LMS, with only limited evaluation of the pedagogical aspect, is discussed in previous research (Phelps & Michea , 2003).

In addition, Sinclair & Aho (2018) state that, although methods for communication and curricula delivery have changed by the introduction of LMS, the use of teaching functionality and LMS pedagogy has not changed.

Based on the above, one interesting question when looking at how teachers adapt to new technology, is whether a change of LMS would result in changes of the individual teacher's way of teaching after the change has taken place or not. Alternatively, will the need to learn a new LMS prohibit the teacher from transforming the way of teaching and instead settle for an automated version of the same teaching style?

Faraon, et al., (2011) found that teachers tend to have a positive attitude towards the use of social media in their teaching. The contribution of that study is that it reflects the attitudes and methods used by teachers involved in teaching distance courses (e-learning). It would also be interesting to find out whether the same attitude toward and use of social media and/or other virtual tools exists among the teachers that teaches on campus courses or in a mix of course types.

Research question 1 is interesting for this specific study, because any transitions in teaching practice made as a result of the implementation in 2014 have been up and running for almost four years by now and any changes based on the pre-implementation 2014 use of the LMS should be present. The research question therefore is:

RQ 1: What are the main effects, if any, on teachers when an implementation of an LMS takes place? Are potential effects pedagogic, insofar as they alter educational aims, are they limited to enabling new forms of delivery, or are there other concerns that affect the way teachers use the LMS afterwards?

This is a question with many facets, the first being whether or not, the teachers changed their way of teaching, after the previous implementation in 2014 by using more of the functionality of that particular new LMS. The second one has to do with what potential barriers to the adoption of new ways of teaching exist or will be established in connection with the new implementation of an LMS in 2018.

The implementation project management at HKR have planned to carry out a specific training programme in connection with the implementation. The project introduced a concept of so-called "Ambassadors" to assist in the initial work on how to configure the new LMS. The Ambassadors, approximately 20 persons, from all faculties at HKR representing the teachers at HKR. There were no student representatives among the Ambassadors, neither were there any personnel from the administrative functions at HKR represented.

This use of Ambassadors raise an interesting question about whether the configuration (set-up) of the LMS will be representative for the majority of users or if it only reflects the Ambassadors thoughts´ and assumptions about how the LMS functionality should be set up. As stated by

Alhogail & Mirza (2011) an implementation project need to address some actions/activities in order to secure a successful implementation of an LMS. The specific actions/activities that might apply to this project are:

- Creation of the user coalition group that covers all stakeholders
- Design of training programs to empower people to effect change
- Creation of change agents team to communicate the change vision

The Ambassadors might possibly be identified, or not, as change agents or as a user coalition. Either way, the project management perceives the work of the Ambassadors as an important factor influencing a successful implementation. In their role, the Ambassadors have to consider the non-included teachers and the way those are working (teaching) in order to influence the set up of the system. The second research question is:

RQ 2: What influence do the Ambassadors have in an overall project management context? Is it limited to the role of a change agent or user coalition for the project management, or do they have additional impact on the configuration and successful implementation of LMS?

This question has two facets. The first one has to do with how the Ambassadors perceive their role in regards to the role intended by the project management. The second one has to do with the motivational factors that made the Ambassadors participate in the project. Lessons learned from the study will tell us more about how a change agent or coalition of users will influence an implementation project of an LMS.

The findings from the two research questions are intertwined, as an implementation will have to consider the use of change agents (Ambassadors) and the effects on a teacher is a result of the actions/activities performed by the selected group of Ambassadors.

1.3 Topic Justification

When trying to conduct research in a field studied by many researchers it is imperative to find a specific approach that makes the study valuable. The following two aspects motivate this study.

This study will from a perspective on how teachers use an LMS and/or other types of Virtual Learning Tools, try to identify possible effects on teachers when implementing a new LMS. Other studies have explored how teachers use LMS, but most studies were conducted from the status of a completed implementation. This study seeks to find effects identified due to the new implementation project starting in a setting where teachers have just finished a project of LMS implementation, have used it during a time of four years and being more or less satisfied with the current solution and it will be conducted during the implementation phase. To my knowledge, this specific situation has not previously been researched. The study will provide the result as a map of how an LMS at HKR is and might be used. As such, it fills a gap in our knowledge about the role of pedagogical approaches during an implementation process for an LMS. This study provides a basis for comparison in other HEI.

This study will also look at how the project management in an implementation project use change agents and/or user coalitions in order to facilitate a successful implementation, particularly in an educational environment. Other environments, like an implementation of an ERP system might use change agents/user coalitions differently, thus this study will contribute to the knowledge of project management from a project management perspective in an educational environment.

1.4 Scope and Limitations

This study will not include all stakeholders who uses an LMS in a HEI. Administrative personnel, apart from the project management team, and students are excluded. The decision

not to include students or administrative personnel is partly based on the presumption that the personnel is not directly involved in teachers' use of an LMS for teaching and thus have limited influence. There was no representation in the Ambassadors group by any such personnel. However, the administrative personnel do have a role to play in the overall discussion on the use of various systems in connection with education. Students did not participate in the project at all and incorporating them in this study would perhaps have given more insight on the use of an LMS, but the explicit student perspective in this study has not been included for the sake of convenience.

1.5 Thesis Organisation

The thesis is organised in the following way. See figure 1 for a visual picture of the process.

Chapter 2 conducts a review of relevant literature used throughout the thesis in order to illuminate and discuss the various subjects for this thesis. It will consider the topics of Learning Management Systems (LMS), other virtual tools, implementation, change management perspectives, and will incorporate a teaching perspective.

Chapter 3 presents the information on the use of different methodologies, participants together with information on how to collect and analyse data, along with a discussion of the validity and reliability of the thesis.

Chapter 4 will present the findings from the data collection, in the form of tables for a quick interpretation and in some cases, a more detailed description of the findings.

Chapter 5 present a discussion of the findings, using the research identified during the literature review and an additional search on relevant research on issues discovered by the data analysis.

Chapter 6 will be conclusive in the sense that it will present the conclusions made from the study, discuss the contribution of the study and suggest topics for future research.

Figure 1: Structure of the thesis

2. Literature Review

In this section an overview of the literature on LMS, the implementation of an LMS and other topics related to the area is given. The review is by no means a full account of available literature.

2.1 Learning Management System (LMS)

There are a number of terms associated with the Information System (IS) support to teachers when performing their duties as teachers.

Weller (2007) discusses some common terms, of which LMS is one, and uses the following definition:

A learning management system (LMS) is a software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums. (Whatis.com, 2018)

Another term discussed by Weller (2007) is Virtual Learning Environment (VLE). When using the source Whatis.com for the definition of VLE you will get the following;

A virtual learning environment (VLE) is a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process. The principal components of a VLE package include curriculum mapping (breaking curriculum into sections that can be assigned and assessed), student tracking, online support for both teacher and student, electronic communication (e-mail, threaded discussions, chat, Web publishing), and Internet links to outside curriculum resources (Whatis.com, 2018).

To get a fuller picture of all information systems connected to teaching used at a university, one also needs to consider administrative information systems that are used to handle various forms of student records. When these information systems are considered, the term Managed Learning Environments, is sometimes used. However, this does not imply that all virtual tools are to be incorporated in the definition of an LMS. Using a web site or application not specifically developed for being used in a learning context is not considered to be regarded as using an LMS (Weller, 2007).

As the definitions of the terms LMS and VLE are almost identical, this study will not focus on choosing the most correct term to use, but instead focus on the use of LMS and other forms of virtual tools used by teachers in their work. See the section below on “Other virtual tools used in connection with teaching” for some examples of other virtual tools.

This study uses the term Learning Management System (LMS) throughout the report.

2.1.1 Functionality (use) of an LMS

AN LMS contains a lot of functionality. From a user’s perspective, personalization for specific needs and support for collaborations between various interest groups like teachers, students and administrative personnel are normally available.

AN LMS supports teachers in their work by providing access to teaching material and assignments. It is common to use an LMS for purely online (distance courses/e-learning) or as a supplement to classroom teaching.

Weller (2007) discusses, based on the topic of eLearning i.e. distance courses, the use of the Internet as tool for deploying education. The discussion hold two viewpoints, dialog and content delivery. Dialog supported by the possibility of two-way communication, both synchronous

and asynchronous. Content delivery supports a cost-effective way of delivering study material globally and making it accessible on demand (Weller, 2007). This discussion could also apply to courses given at campus, as the examples in the introduction section shows.

Another, more detailed way of describing the features of an LMS is to split it into four functional quadrants of (a) Communication and Collaboration, (b) Content Resources, (c) Site management and (d) Evaluation and Assessment (Griffin & Rankine, 2010).

Communication and Collaboration incorporates functionality for communication between student-student, teacher-student and the teaching staff. In this quadrant, there are advantages of an administrative form, such as the easiness to read, respond to and archive emails between teacher and students/fellow teachers. The communication is within the LMS and thereby it will, in principle, be less time consuming as opposed to when communication is taking place in many systems. The threaded discussion boards are often used for communication within a course and when using discussion boards, the need for the teacher to be the storage of all knowledge diminish, which lighten the administrative burden (Griffin & Rankine, 2010). Other means of communication are chats, text-based or voice-based (Anderson, 2016).

Among the functionalities in the Content Resources are functionality for uploading course content, creation of learning objects and refreshing courses. (Griffin & Rankine, 2010).

In the Site Management quadrant, the LMS contains functionality for grading and student tracking. One administrative use of the grade book is to register student marks based on assessments. Within an LMS, it is to various degrees possible to track the student's behaviour, for example finding out how often a student has visited the LMS in a specific course (Griffin & Rankine, 2010).

In the quadrant, Evaluation and Assessment, functionality for automated marking and electronic submission of tests are common. The use of automated marking can save considerable time for a teacher (Griffin & Rankine, 2010).

There are functionalities not mentioned in the discussion of quadrants directly by Griffin & Rankine (2010). Sharma & Vatta (2013), for instance, mention functionality for the integration and support of third-party applications. Examples of integration from a third-party supplier are textbook questions from a textbook supplier (Anderson, 2016).

Another functionality that an LMS could support is the support of effective student learning through Analytics. Suppliers of LMS systems are developing tools for this in a higher volume (Anderson, 2016).

Among the latest developments of LMS functionality is the incorporation of external group creation tools like Google Docs, project management tools with time limits and groups, peer marking tools, blogging and reflection tools (individual or group wise) and the ability to import multi-media from other sources (Anderson, 2016).

The most common LMS in use at HEI in Sweden are Blackboard, Moodle (open source system), Ping Pong and It´sLearning. However, over the next few years the numbers might fall to one or two, based on the framework agreement described in the Introduction.

2.2 Implementation of an Information System and the concept of Change Management

This section presents literature regarding implementation of information systems in general, implementation of LMS specifically, and the concept of change management. The choice to separate these topics was made, as it will help in understanding the possible similarities and/or differences when implementing different types of information systems and the impact of change management in such implementations.

2.2.1 Implementation of an Information System

When developing an information system, a number of models can be used as support for the development. The most traditional approach is the Waterfall model of the Systems Development Life Cycle (SDLC). The model structures the development into six phases, system investigation, system analysis, system design, programming and testing, implementation and operation and maintenance (Rainer Jr., et al., 2015). See figure 2 for a schematic view of the model. A short description of the model based on Rainer Jr., et al. (2015, pp 321-326) follows below.

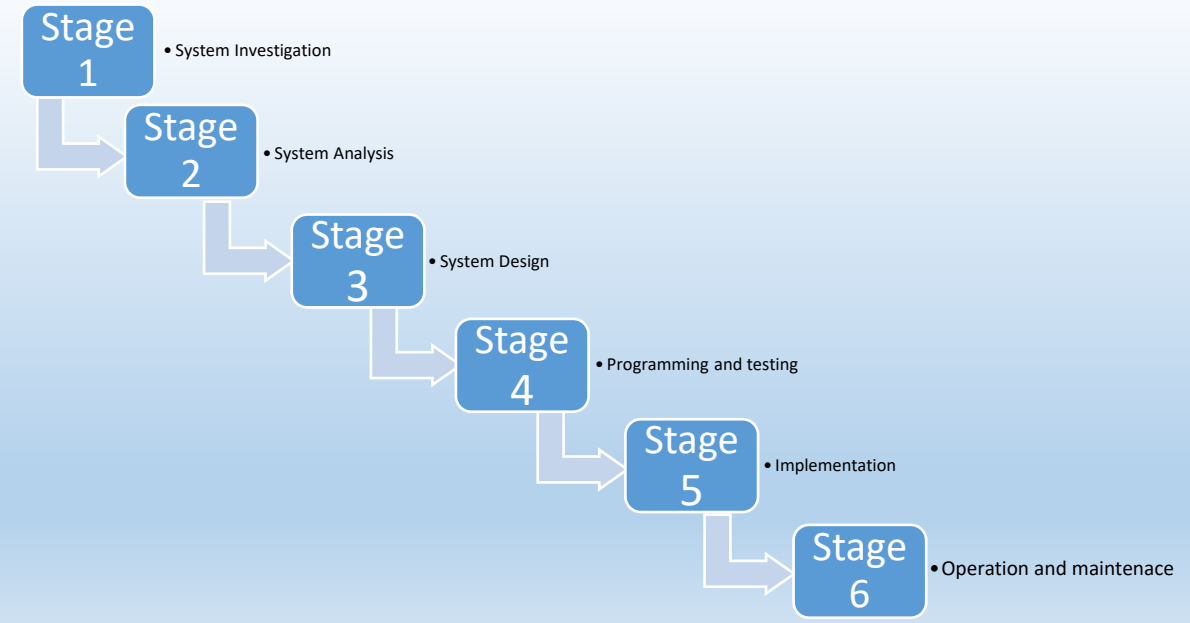

Figure 2 Systems Development Life Cycle. Source: Adapted from Rainer Jr. et al (2015)

The different stages have very clear defined tasks, and if problems occur in one stage, the developer has to go back to previous stages in order to solve the problem. The system investigation phase identifies the actual business needs, using a feasibility study, which look at technical, economical and behavioural aspects in order take a decision of doing nothing, or just modify the existing system or develop a new system. Discussions on the various business problems that the development is supposed to solve, take place in the system analysis stage, thus gathering information about all the requirements and a final deliverance of a set of system requirements. In the systems design stage, the system is set up and specifications of the setup is approved. In stage 4 the programming and testing takes place, which is followed by the next stage, implementation. In the implementation stage, the new system is deployed either directly, or in a pilot version or as a phased implementation of specific functionality or at specific organisational entities. The last stage is the daily operations and maintenance of the new system (Rainer Jr., et al., 2015).

This model is generic, but contains all the important features that a project with the goal to acquire a new system from a vendor demands. Of course, other models are used for developing systems. Just to mention a few; Joint Application Design (JAD), Rapid Application Design (RAD), Agile development and End-user development (Rainer Jr., et al., 2015). The choice to incorporate the particular model of SDLC is that it is easy to comprehend and thus easily applicable to this study.

The actual selection of a vendor of packaged information system, takes place in different steps. Keil & Tiwana (2006) have developed a model that describes these steps. The model contains

four different steps: needs assessment, identification of packages, assessment of fit and decision. (Figure 3 illustrates the steps).

Figure 3 General process for choosing packaged software. Adapted from Kiel & Tiwana (2006)

These steps are part of stage 1 in the SDLC model and thus the trigger for further activities in the development cycle.

2.2.2 Implementation of an LMS

A number of researchers, using different perspectives, have researched the implementation of an LMS. Millard (2006) indicates that the implementation of or a change between LMS will have considerable influence on the individual faculty members use of time, need of effort and might result in anxiety. Time to attend training seminars, learn the complexity of a new system and finally yet importantly incorporate this into their family situation may all affect motivation and competence. (Millard & Essex, 2006).

Keller (2005) has studied the implementation process for the implementation of an LMS, using models from research on implementation of information systems and organisation theory. The study introduces three perspectives on implementation of LMS, implementation as technology acceptance, implementation as diffusion of innovations and implementation as a learning process (Keller, 2005).

Implementation as a technology acceptance use the models of Technology Acceptance Model (TAM), Social Cognitive Theory and the Unified Theory of Acceptance of Use of Technology (UTAUT), for a definition of the perspective. See figure 4 for an adapted overview of the UTAUT model.

The individuals´ attitude towards accepting a new technology or not, Behavioural Intention, is a result of four variables, performance expectancy, effort efficiency, social influence and facilitating conditions. A positive performance expectancy is created when an individual expects the system to support their job performance. If the system is easy to use, the variable of effort efficiency is positive. The variable social influence shows to what extent, the individual perception on how to use the system is influenced by other members of the community. The variable facilitating conditions is an indicator to whether or not the individual perceives the existence of a supporting organisational and technical support.

Keller (2005) builds the perspective **implementation as diffusion of innovations** around Rogers (2003). An innovation can be any idea, practice or object an individual or organisation perceive to be new. This innovation will be subject to a process (diffusion) that initiates change and leads to consequences.

In order to make a decision on whether or not to adapt to a new innovation, the individual goes through a decision process in five steps; knowledge, persuasion, decision, implementation and confirmation. Starting from the individual being exposed to the innovation and ending with the innovation being put to use or being abandoned. (Keller, 2005)

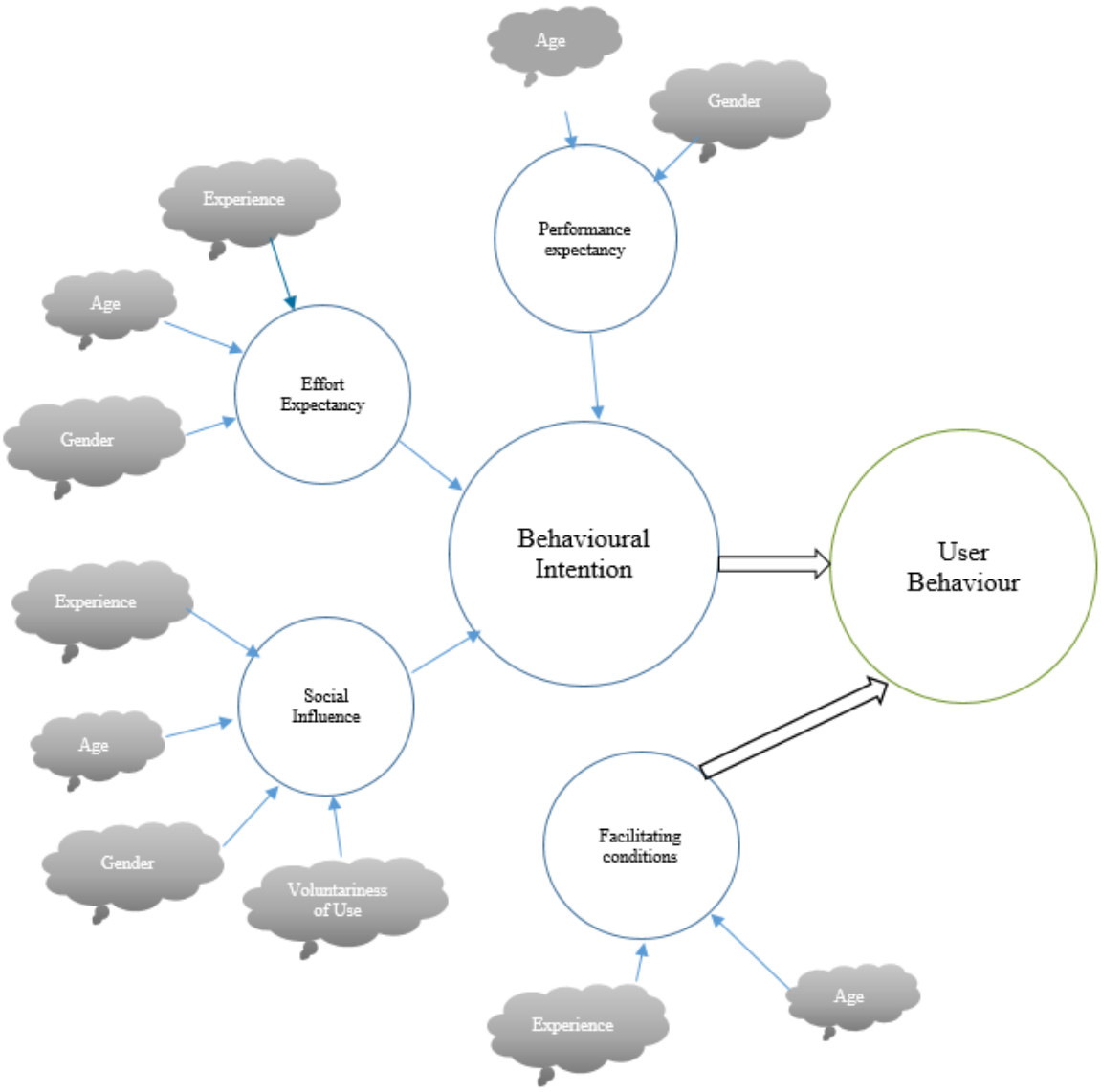

Figure 4 Unified Theory of Acceptances and Use of Technology (Adapted from Venkatesh et al. 2003, p. 447)

Which type of decision imposed on the individual affects the decision made on the acceptance or rejection of an innovation. The decision could be optional, i.e. independent, collective, i.e. consensus among members or made from authorities (Keller, 2005).

Keller (2005) uses the community of practise model in order to illustrate the concept of **implementation as a process of learning**. She uses the research from Hislop (2003) to explain how a community of practise influences the implementation (innovation) of an LMS, as the members of a community of practice share attitudes and behaviour. So-called boundary objects support communication between different communities of practise in an organisation An LMS is an example of a boundary object, as it facilitates the communication between teacher and students. The characteristics of a boundary object is **modularity**, different users see different views of the system, **abstraction**, distinguishing important features, **accommodation**, comprising different functions to different activities, and **standardisation**, functions and information is organised in the same way in all courses (Keller, 2005).

Keller (2005) finds that the only perspectives that consider students are the perspective of implementation as a learning process. The implications for a successful implementation of an LMS are different, based on the choice of perspective. The implications are summarised in figure 5.

Implications\Perspective	Technology Acceptance	Diffusion of innovation	Learning process
Successful use will take place due to	• Enhancement of solutions for educational tasks • Easiness of use • Improve user´s self-efficacy	• Fulfilling a performance gap • Creation of visible outcomes • Consistency with existing beliefs • Level of complexity when used.	• Provision of modularity, abstraction, accommodation and standardization • Support of informal communication • Design for participation
Successful implementation…	• Receive support from formal and informal leaders • Build om reliable technological infrastructure	• Is internally induced • Based on consensus • Offers pre-testing possibilities	• Allow peripheral participation • Consider impacts on different communities of practice

Figure 5 Implications for successful use and implementation of VLEs. Adapted from Keller (2005).

2.3 Adoption of LMS in higher education from a teacher´s perspective

To start the review on LMS from a teacher's perspective, a walk-through of research from a pedagogical context starts the section.

2.3.1 Approaches to teaching

According to Liem & McInerney (2008), best practice in teaching and learning has evolved from a behaviourist approach, developed through a cognitive approach to the more modern constructive approach. Thus making a move from a perception of students being passive recipients of knowledge supplied by a teacher, to a thought that students construct their own knowledge and understanding, which puts pressure on the teacher to facilitate this process of knowledge construction (Liem & McInerney, 2008). The difference in each approach can be summarised with the help of figure 6 adapted from Mishra (2002), which shows that a behavioural approach mainly is about delivering content, the cognitivist approach is to support learners while the constructivist approach is about supporting learner activities.

Liem & McInerney (2008, p.8-9), also list principles of best practice in teaching and learning from a constructivist view. These principles say that best practice should:

- Be learner-centered
- Recognize the developmental stage of the students
- Aim to develop students´ thinking skills
- Foster students´ introspective thinking skills
- Emphasize the use of authentic tasks
- Assign students optimally challenging tasks
- Promote experiential learning
- Promote Collaborative learning

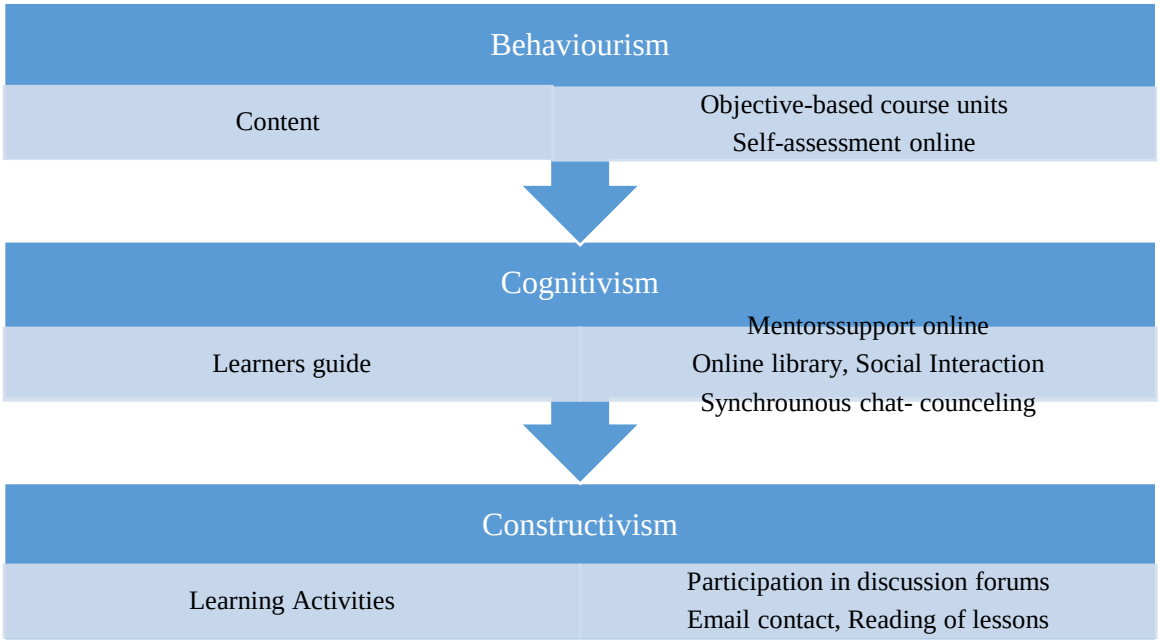

Figure 6 Design Framework for Online Learning environments: Adapted from Misra (2002)

These principles can be seen in the light of Rodriques (2004), who lists ten different teaching/learning techniques, dividing them into passive or active techniques. The active techniques are case studies, individual research projects, group projects and classroom discussions. The passive techniques are lectures, reading, guest speaker, video shown in class, classroom presentations and computerized learning assignment. The students' top-three ratings were lectures, classroom discussions and reading textbooks, as were the teachers' ratings. These techniques are the more traditional techniques. The overall key to a successful use of them is communication (Rodriques, 2004).

As the world is changing, influenced by the building of social networks, so does the demands for support of an LMS in a teaching environment. New ways of content sharing and communication will put pressure on the development of new LMS (Stone & Zheng, 2014). One of the trends in the educational area is the development of MOOCS, Massive Open Online Courses, as a supplement to traditional campus and/or online courses. This development does put a pressure on the teaching institutes to develop systems and teaching methodologies that facilities the move from the traditional campus and/or online teaching to the more elaborate digital online teaching environment. In order to support this development, the LMS needs to be more open, more personal, more flexible, more analytical and more mobile (Stone & Zheng, 2014).

As mentioned above, LMS supports online teaching and classroom teaching. Research has found that when adopting an LMS, teachers often continue to use the same teaching methods that they used in a pure classroom setting. Nothing changes, only the way of delivering educational material is altered (Renzi, 2011). Using a model based on "The Theory of Planned Behaviour (TPB)" (Ajzen, 1991), Renzi (2011) performed a study that showed three different groups of teacher and the difference among the groups regarding their willingness to adopt their teaching to online social interaction (OSI). The three different group's approaches to the LMS were a) only uploading teaching material, b) making discussion forum available and c) integration of collaborative learning activities. Approaches a and b can be considered as an attempt to use the LMS as a tool for automating teaching, while approach c is an example of how the teachers have transformed their teaching (Renzi, 2011). The mirroring of face-to-face education in classrooms to an LMS environment is also identified by Blin & Munro (2008), who found that teachers tend to favour distribution of course material and not develop

interactive and collaborative tasks with the help of an LMS. Blin & Munro (2008, p.487) also states that:

> *"… the low uptake of more advanced functionalities is the result of a lack of a perceived need and/or motive for changing one´s current teaching practice, combined with a lack of knowledge and competencies on the part of lecturing staff despite training opportunities and on-going support offered by the learning innovation unit."*

West et al., (2007) state that teachers do not adopt all features of an LMS, instead they find the features that is considered to be most useful in their teaching.

There are a number of underlying pedagogical approaches to learning and teaching, which an LMS could support. Weller (2007) identify and discuss these approaches according to its use in the context of on-line delivery. The approaches are:

- Community of practice/socio-cultural learning
- Resource-based learning
- Peer learning
- Content-led/instructivist learning
- Complex learning
- Problem-based learning
- Collaborative learning
- Instructor-led learning (Weller, 2007, p. 19)

A short description of the approaches and the tools used in each approach, based on Weller (2007, pages 19-28), follows below.

Community of practice/socio-cultural learning is the thought that learning is a social process, built on engagement, intelligibility and participation. The students belong to a community of an academic discipline. In this approach, engagement is not only with the student peer, but also with other members of the community, in or outside the actual course. The student is a natural user of different social media technologies. The students can use Wikis, podcasting and blogs to observe, participate and get acquainted with the specific culture of the community in which the student is becoming a future member of due to his/hers studies. Access to resources like audio, video, links to discussion forums and newsgroups are important in order to give the students access to the community they belong to, as current student or future employees. This puts an emphasis on the learning platform to provide seamless integration to other systems.

Resource-based learning builds on the vast collection of resources that are available by the use of internet technology. The students are encouraged to search for, select, analyse and comment on the resources found and used. This approach need a support for dialogue between peers and instructor. Examples of support are threaded discussion boards, sophisticated library access, search tools, online note-taking tools, and ranges of formative tests and quizzes. The ability to store vast amount of material also becomes important with this approach.

Peer learning emphasises the interaction and learning from peers, as the students share documents and give each other comments on the material. For peer learning, communication is vital. Asynchronous discussion boards are a useful tool, alongside the synchronous use of tools for real-time meetings. The students must also benefit from sharing resources in a content area. The need for assigning a marker to a peer can be handled manually, but some support for an automatic form of random allocation of markers could save time and effort for the teacher.

Content-led/instructivist learning focus on the students interacting with the given content, thus creating a necessity for an LMS to have the functionality to support the storage, delivery of and interaction with material in various formats.

Complex learning, focus on complex skills like critical thinking, analysis synthesis and evaluation across and/or between courses. The coordination of a programme, for instance a business administration track, is in many LMS not supported on a course level. Normally, the LMS focus on the individual course level, thereby not giving the educator support to manage students at a programme level. The solution to this dilemma is often an integration of third party tools and the use of some form of portal that support collecting of information, online diaries, calendars, personalised areas for note-taking and portfolios.

Problem-based learning, gives the student a problem, which the student is supposed to solve by finding the information needed and developing skills that helps them in the pursuit for a solution. Content management, asynchronous as well as synchronous communication, and tools for formative assessment are features that the LMS must support.

Collaborative learning, include students collaborating in groups, with specific tasks and having discussions with the joint effort to solve the task that are given. Given the collaborative aspect of this approach, the support dialogue and communication is vital. The asynchronous discussion tools needed are normally more sophisticated, for instance by giving students information on who have read messages, access to linked messages, ability to add attachments and summarizing threads.

Instructor-led learning is the traditional way of the teacher transferring information or knowledge to the student. And the support for structuring a course in folders with lecture notes and presentations alongside discussion boards are the most common features of an LMS.

How a teacher in a specific course actually uses the LMS is of not only an effect of the chosen pedagogical approach, but also issues like finance, time and other resources and of course the context of the course itself, will have an impact on the usefulness of an LMS (Weller, 2007).

One aspect of the different pedagogical approaches is how the teacher interact with the students, specifically when using online discussion forums. Should the teacher act as a "sage on the stage", a more guiding role or just lay low and let the forum run almost without intervention (Mazzolini & Maddison, 2003)? Which strategy would facilitate the teaching and learning the most? An attempt to answer this question is made by Mazzolini & Maddison (2003), who states that the more the teacher is the stage manager, the less the interactions (shorter) with the students will be. Students might be more inclined to participating in a discussion when it is initiated by fellow student (Mazzolini & Maddison, 2003).

Although Weller (2007) discusses the pedagogical approaches from an e-learning perspective, they might be applicable in a mere campus based education. However, the development towards the concept of MOOC tends to speed up the process of adjusting the pedagogical approaches for all types of courses.

However, there are other perspectives to consider when discussing the pedagogical support delivered by an LMS. One perspective presented by Iqbal & Qureshi, (2011) is the concern on whether or not an LMS supports deep learning.

Carmean & Haefner (2002, p. 28-29), defines deeper learning as

> *"an engaged learning that results in a meaningful understanding of material and content. This deeper learning experience occurs when learning is social; active; contextual; engaging; and student-owned"*

The asynchronous environment of the online social world makes it possible for the diverse learner, shy students and reflective thinkers to share information, reflections and help outside the traditional classroom setting. Interactive testing features provide the learner with quick feedback, information to handle misconception and an activity based learning. The use of Real-world case studies facilitate the integration of students to a specific context, a framework of their own based on problem solving activities. The ability to store content of various kind in an LMS, gives the teacher an opportunity to engage students in self-discovery of course material. Moreover, as "*learning happens when the student choose to learn*" (Carmean & Haefner, 2002, p. 33), the ownership need to be nurtured by the teacher (Carmean & Haefner, 2002).

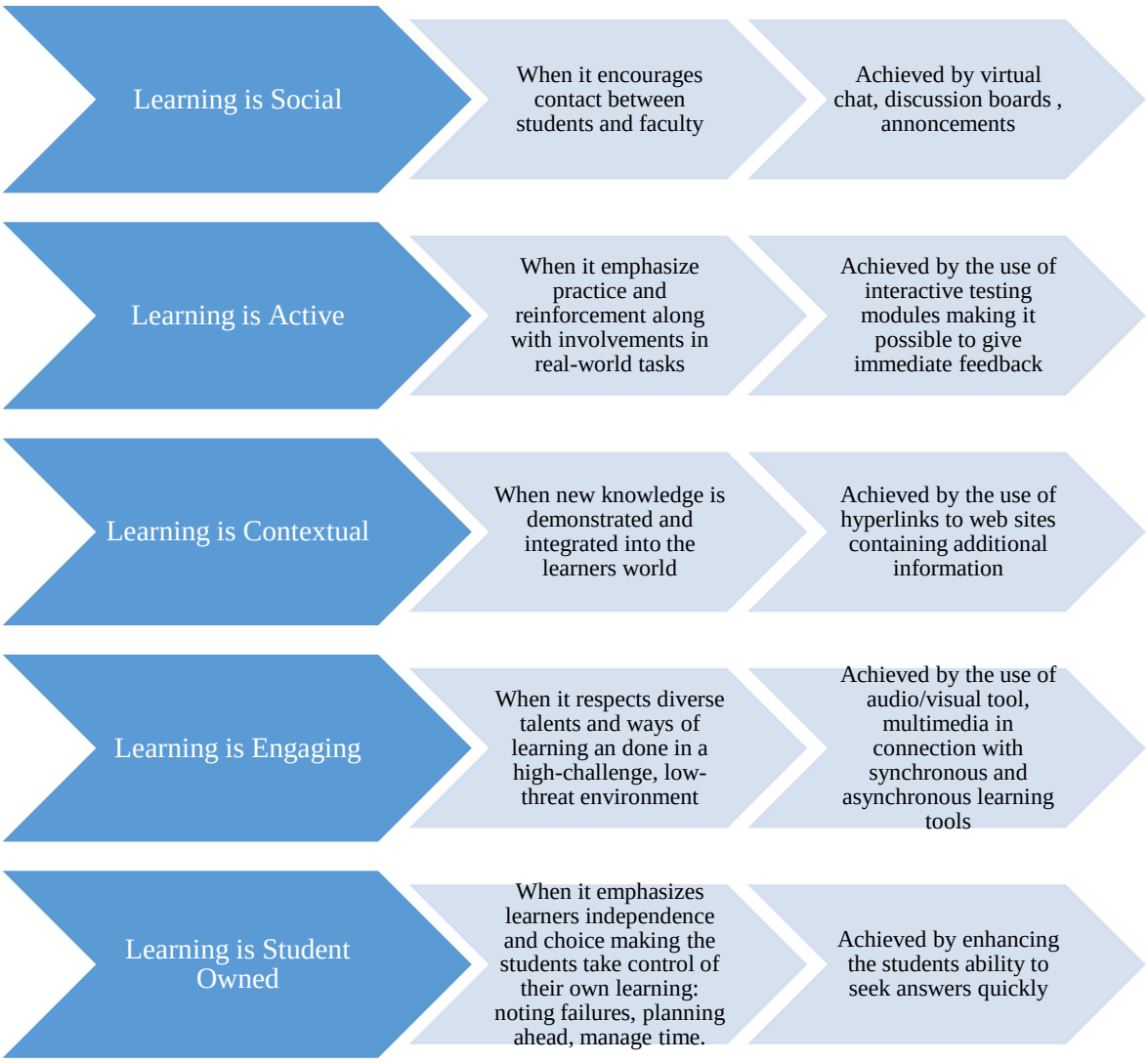

Figure 7 Deeper Learning Principles in LMS (Adapted from Iqbal & Qureshi (2011))

Building on Carmean & Haefner (2002), Iqbal & Qureshi (2011) present the support for deeper learning given from an LMS environment. See figure 7 for a summary. The list contains tools like chat, discussion boards, interactive testing modules hyperlinks, presentation tools, audio/video tools and search tools, used both synchronously and asynchronously.

The support of various pedagogical styles in an LMS is of such importance that it should be included in the evaluation of an LMS before an implementation (Iqbal & Qureshi 2011; Govindasamy 2002). In addition, teachers using an LMS should make demands for fully integrated pedagogy to the vendors of an LMS (Govindasamy, 2002).

Another aspect mentioned by Govindasamy (2002) is the one of teachers being transformed from mere instructors to roles like content experts, instructional designers, graphic artists, media producers, programmers AND[1] instructors. In order for this transformation to take place, the teachers must get the relevant knowledge and time. It is only the early adopters, teacher with the ambition to learn something new and exciting, that embrace all the roles (Govindasamy, 2002) .

2.3.2 Virtual tools used in connection with teaching

There are a number of new tools of a virtual nature used in, not only in net-based higher education, but also in campus-based higher education. Weller (2007) lists some new tools, among them are blogs, wikis, podcasting, social software and instant messaging.

Web logs, or blogs, can be of two different types; either in form of journal, in a more dairy format or as a filter in which content from other web content is linked to or commented on. The second type might be more interesting from a teaching/learning perspective. Based on the commentary format, blogs are a tool that could initiate debate and exchange of ideas (Weller, 2007).

In contrast to a normal web page that is more or less static, a wiki allows users to add content to and edit content in the page, thus making the web page as such an area that are changing in synergy with the providers, a community or other interested parties, efforts to contribute to the content (Weller, 2007).

Podcasting is a blog in an audio format. Audio files are published and can be listened to on the site or downloaded to portable devices (Weller, 2007).

Software that help groups to interact and form communities are often named social software. Flickr, where you can upload picture, put tags on the photos, comment on photos and share photos, is one example of this kind of software (Weller, 2007).

The application WhatsApp is a form of Mobile Instant Messaging Services used for communication. Mahapatra, et al. (2016) studied the use of WhatsApp in connection with an LMS system and found that the integration between the LMS and WhatsApp did enhance the response time in teacher-student communication and also made it possible to access the instructional content published on the LMS more easily (Mahapatra, et al., 2016).

The incorporation of social media into the teaching activities and the media openness creates both opportunities and challenges. The faculty could focus on the effective management of the education process and let the social media facilitate the creation, exploration and communication among faculty and students. The drawbacks are in the potential misuse and academic misconduct (Anderson, 2016).

Faraon, et al. (2011) researched the use of social media like Skype, Adobe Connect, Facebook, Twitter, YouTube, blogs (WordPress) and Wikis among teachers and students in a net-based higher education in order to find out how social media influenced the design of context. The teachers used these tools alongside more traditional LMS supported tools like e-mail, video conferencing, text based chat in order to support lecture formats of video, PowerPoint with/without sound and text based. The study showed significant differences in the use of social media among the teachers and among the students, based on their educational topics (science and technology, humanities, clinical, social sciences, educational science). The study also showed that the instructor-centered approach as opposed to the student-centered approach of learning was still dominating the teaching and learning settings. (Faraon, et al., 2011).

[1] Uppercase inserted by the researcher

In order to get an overview of all tools used in connection with teaching, the survey of Hart (2018) is used. It identifies 100 different tools used in connection with education. See figure 8 for details. The tools are assigned to various categories; presentation tools, document tools, audience response tools, LMS, collaboration platforms, audio and podcasting tools, blogs and web page tools, etc…

Figure 8 Top 100 Tools in education. Source: Hart (2018) Permission to use granted.

The teachers in this research are familiar with and uses some of these tools.

2.4 Change Management

Other studies focus on the issue of change management during a change project for organisational changes and/or implementation of information systems. This section starts with a more general presentation on how a change within an organisation challenge the organisation. The model is generic, but set the base for understanding the models on implementation of an LMS.

2.4.1 Change Management according to Kotter (1996)

Kotter (1996) discusses the challenges a business encounters when it has taken a decision to implement a major change in one or many specific area(s) of the business. With the help of a process divided into eight stages (Kotter, 1996) the challenges are avoided. A presentation of the model based on Kotter (1996, pages 25-143) follows below.

Before discussing these steps in depth, Kotter makes a point of explaining the difference between management and leadership. In short, management is about keeping businesses running smoothly and leadership is about making changes happen by the use of a vision, communication and motivation of the needed changes.

The stages are as follows:

1. Establishing a sense of urgency
2. Creating the guiding coalition
3. Developing a vision and strategy
4. Communicating the change vision
5. Empowering broad-based action
6. Generating short-term wins
7. Consolidating gains and producing more change

8. Anchoring new approaches in the culture

When initiating a change, it is vital to establishing a sense of urgency in order to motivate the need for change. One common obstacle in establishing the sense of urgency is the amount of complacency within a company. Among the reasons for complacency are the non-visibility of a crisis, the subtle messages of success like expensive furniture or airplanes, low standards of performance measures, focus on narrow functional goals instead of broad business goals and senior management's talk of a secure situation. These obstacles have to be identified and removed. To do this it might be necessary to create an artificial crisis (Kotter, 1996, pp. 39-46).

In order to make the change happen a strong guiding coalition, group of people involved in developing a vision, communicate the vision throughout the company and eliminating obstacles, is needed. When establishing this group characteristic like position power, expertise, credibility and leadership are important to find among the selected people.

A vision is a picture of the future that helps in clarifying the directions of change, motivating people to take appropriate actions and facilitate coordination of people's actions. Among the characteristics of an effective vision are the picture of the future, the appeal to the long-term interest of employees, customers and other stakeholders in the company, realistic and attainable goals, focus, and flexibility to allow initiatives and the ease of communication.

Among the key elements of communication are its simplicity, use of metaphors, analogy and examples, the use of multiple forums, repetition and leadership by example.

The obstacles to empowering employees to take appropriate actions in order to follow the vision are formal structures, lack of needed skills, established systems hindering and discourages from formal supervisors. These obstacles need attention and in some cases removal. Confronting supervisors and providing training are examples of actions that would be necessary.

It is important to identify and communicate short-term wins in order to establish credibility for the change. A short-term wins is visible to a large number of people, is unambiguous and without any doubts related to the change efforts. A short-term win will justify the cost involved, reward people and give positive feedback, provide evidence that the change is on track and help convincing neutral and reluctant people towards a more positive attitude.

The use of short-term wins is an important base for consolidating gains achieved. In order to accomplish the change fully, it must have a long-term perspective. It is important that the change become a part of the culture and the interdependences within a company. Often the change is consolidated by using credibility of the short-term wins as a base for doing bigger changes. Additional people can be brought in; senior management leadership need to be focused on making the overall effort and urgency levels at a necessary level and unnecessary interdependencies must be eliminated, so that the momentum of the change is not lost.

As a final stage in a change management process, the incorporation of new approaches in to the culture of the company is vital. These new approaches are dependent on the results of the change, will require a lot of verbal instructions and support, it may affect the promotion processes and in some cases create

2.4.2 Change Management in an LMS perspective

One way of looking at an implementation of LMS, specifically is by using a framework suggested by Alhogail & Mirza (2011) which consists of the following components (See figure 9 for an overview):

An implementation project should start with an *analysis of the institutional context* by weighing the goals and strategies on their strengths, weaknesses and opportunities, in order to choose the appropriate planning and tactics of change. Identification of s*ufficiency of resources* is the next

vital component, as lack of human and technological resources may influence the implementation negatively.

The *selection of the VLE that supports the language of academic staff and students* is perhaps not an issue but have implications for the potential barriers to the support from the LMS when teaching.

A change always raises questions and resistance, so activities in order to *get people support and ownership* must be determined, with the help of two activities.

First of all a creation of the user coalition group that covers all stakeholders must take place. By the *creation of change agents* team to communicate the change vision within the user coalition group, the communication of the new vision and the new LMS is enhanced. In addition, the dialogue between project management and the users will benefit from the interactions by these change agents.

Secondly, *the design of training programs to empower people to effect change* is vital to the success of the project. These programs could contain various approaches, workshops, seminars, and other training programmes, covering training on how to use different functionalities of the new LMS.

In order to *increase the awareness* of the selected VLE the staff should be encouraged to develop IT skills, take part in training on issues as academic practise in, among other issues, collaborative learning, and attitudes to copyright and accessibility.

The *setting of clear targets* like when a course is to be published, or number of teacher that have uploaded content to the new LMS or participated in training sessions, etc. will also support the needed change.

An *established VLE help desk* with a single point of contact will also facilitate the implementation. And finally, the gradual implementation of the VLE across the university, for instance by faculty or department with mature IT knowledge, will facilitate feedback and lessons learned used for the next steps, thus elimination problems and improve the chances of success.

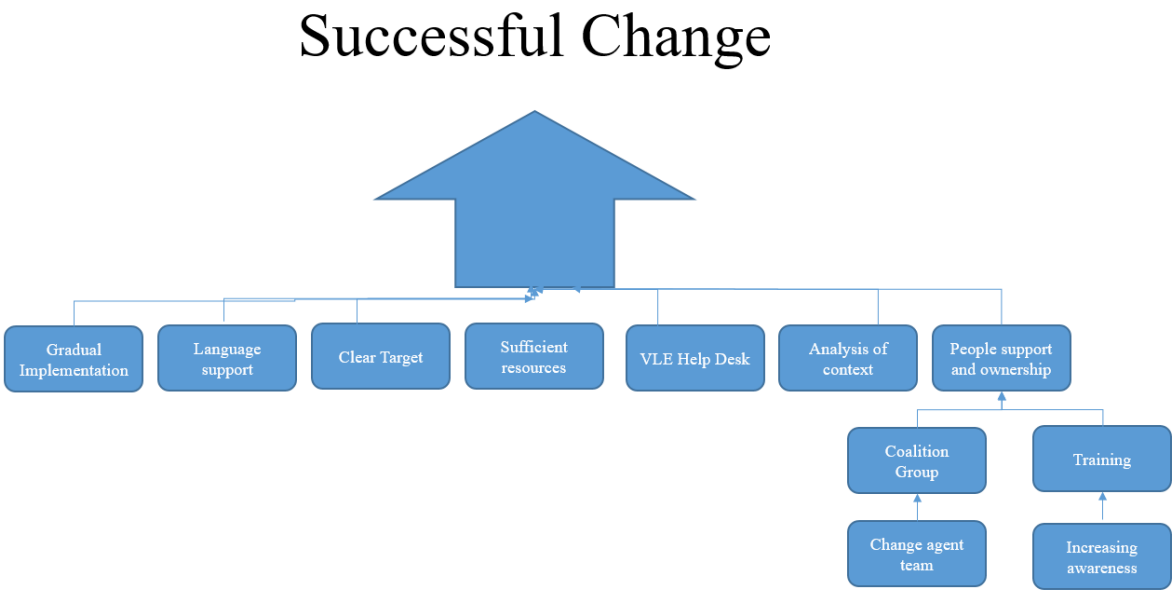

Figure 9 Framework for successful implementation of LMS. Adapted from Alhogail & Mirza (2011)

3. Methodology

This section presents the methodological tradition in regards to worldviews, research philosophy, research methodology, methods for data collection and data analysis, the validity and reliability of the research. The section ends with a discussion on the ethical considerations for this study.

3.1 Methodological Tradition

The underlying, maybe not known to the researcher, assumptions and/or beliefs of the world researched upon, will have an impact on how the researcher conduct the specific research. This is in research terminology described as a worldview. Worldviews;

> *"..are shaped by the discipline area of the student, the beliefs of advisers and faculty in a student's area, and past experiences" (Creswell, 2009, p. 6)*

The discipline of Informatics, the beliefs of the advisers and faculty of the Linnaeus University and the experiences of the researcher, affect the worldview in this study. The researcher´s background in this study originates from previous studies in Business Administration and Informatics as well as work experience in areas within management, accounting, teaching, and information systems.

Beliefs about	Concerning	Explanation
Physical and Social Reality	Ontology	*Whether social and physical worlds are objective and exist independently of humans, or subjective and exist only through human action.* (Orlikowski & Baroudi, 1991, p. 8)
	Human Rationality	*The intentionality ascribed to human action* (Orlikowski & Baroudi, 1991, p. 8)
	Social Relations	*Whether social relations are intrinsically stable and orderly, or essentially dynamic and conflictiv.* (Orlikowski & Baroudi, 1991, p. 8)
Knowledge	Epistemology	*Criteria for constructing and evaluating knowledge.* (Orlikowski & Baroudi, 1991, p. 8)
	Methodology	*Which research methods are appropriate for generating valid evidence.* (Orlikowski & Baroudi, 1991, p. 8)
Knowledge and the Empirical world	The role of theory	*The purpose of knowledge in practice.* (Orlikowski & Baroudi, 1991, p. 8)

Figure 10 Beliefs Underlying the Conduct of Research. Adapted from Orlikowski & Baroudi (1991, p. 8)

Research philosophy describes the underlying philosophical assumptions a researcher makes when doing research. Three distinct epistemologies (or philosophical assumptions): positivist, interpretive and critical form the base for qualitative research (Myers & Avison, 2002). The epistemologies consist of three different kinds of beliefs. Beliefs about the Physical and Social Reality, beliefs about Knowledge and beliefs about the Relationship between Knowledge and the Empirical world (Orlikowski & Baroudi, 1991). See figure 10.

The **Positivist** philosophy assumes that the researcher is expecting some form of fixed structure of relationships in the studied phenomena and form a hypothesis to test this relationship on, or, the researcher wants to describe a phenomenon in an objective and non-interpretative way. The researcher tries to discover the reality of the studied object by models and measurements that will explain it to the researcher. The researcher is passive, neutral and does not intervene. The researcher assumes that the actions taken in the studied environment is rational and intentional. The use of theories and the result from testing those theories establish the knowledge acquired during at study. The theories are verified or falsified. Researchers are just observers who

evaluate without passing judgement or subjective opinions. (Orlikowski & Baroudi, 1991). This is the philosophy also known as “The Scientific method” (Creswell, 2009)

The criticism of the positivist assumptions is that it is not suited to studies of the social world. Its main research area is the natural world, i.e. as in natural sciences. When you are researching the social world, i.e. as in social sciences, it has its flaws. Among the flaws are the difficulty to reduce, i.e. breaking down the studied object in smaller more comprehensible things to study, the difficulty to repeat the study and that the generalisation that the study contribute to, might not be a full representation of the researched object. (Oates, 2006). The use of variables in social science research is important, so the choice of which variable to use will have an impact on the findings. Defining a variable can be done in many different ways, but variables are normally some measurable items, used for formulating hypothesis and developing research questions. In social science research it is sometimes hard to find suitable variables to use, and even harder to break down the variable (Raiphea, 2015).

The **Interpretive** philosophically assume that the researcher tries to understand a phenomenon by studying it in its natural setting in various cultural and contextual situations. The objectivity and the fixed structure of relationships from the positivist is no longer present. Instead, the interpretation of a phenomenon is important. The researcher intends to study and interpret members of a social group and their behaviour within that group to understand how specific actions happens. A social group is influenced by its individual members, the members shared norms and interests and the interaction within the group. The reality created by the group will change due to changes of member, situations and objectives, thus giving a different view of the group in another circumstance. The researcher constructs interpretations or explanations in order to understand the studied phenomena, i.e. to describe, interpret, analyse and understand it from the perspective of the participants. (Orlikowski & Baroudi, 1991). Language, shared meanings, tools, documents, and other artefacts are social constructs, constitutes the foundation of building knowledge of reality and thereby constitute the base for interpretive research (Klein & Myers, 1999). Klein & Myers (1999) also argues that interpretive is not a synonym for qualitative research, as qualitative research can be based on positivist, interpretive or critical philosophy, depending on the underlying assumptions of the researcher. This is the philosophy also known as “The Social Constructivist Worldview” (Creswell, 2009).

The **Critical** philosophical assumption is to critically study a phenomenon, expose it´s underlying structural social assumptions, constraints and contradictions, and transform the studied phenomena. The assumption is that a social group is a result of history and thereby it is not bound to exist in the same way in the future. There are a potential to change the material and social situation. The researcher tries to get the object that is studied aware of the constraints and the possibilities to change. The researcher gathers data and knowledge based on long-term research, historical and ethnographic. (Orlikowski & Baroudi, 1991). This is the philosophy also known as “The Advocacy/Participative Worldview” (Creswell, 2009).

A **social constructivism worldview** with the ambition to understand how the individual teachers act in their workplace is the base for this study. An understanding of the actions as just a teacher in a course setting in order to understand the context of the LMS and specifically when they act as Ambassadors in the project implementation setting in order to understand the process of how their use of an LMS influence the implementation of the new LMS.

3.2 Research design and strategy of inquiry (Methodological Approach)

Research methodology is a strategy of enquiry that helps the researcher to design a study based on the researcher´s underlying philosophical assumptions. The choice of research method influences the data collection and will have an impact on the skills needed for the researcher. Among the research methods used in qualitative research are action research, case study research ethnography and grounded theory (Myers & Avison, 2002).

When doing action research, the researcher is not only collecting data and gathering knowledge within a specific social community, but also tries to transfer this acquired knowledge back to the social community for use in a specific problematic situation. A method that builds on a collaboration between the researcher, the studied social community and a mutual ethical frame (Myers & Avison, 2002).

When doing a case study, the researches studies a specific phenomenon in real life, during a set period. This method is one of the most used research methods within the field of information systems. A case study can be used independent of the underlying philosophical assumptions (Myers & Avison, 2002).

Ethnographic research sets the researcher in direct contact with the life of the studied phenomena for a considerably long time. The method originates from the field of anthropology (Myers & Avison, 2002). However, the emerge of the so-called design ethnography (DE), have made it possible for researchers in information systems to learn more from individuals in the field. This move from the anthropological arena to the information system area has resulted in various research, for instance on black female IT worker, e-infrastructure projects, explanations of organisational change, IT offshoring, member engagement in digital social networks, just to mention a few (Baskerville & Myers, 2015).

When the researcher tries to develop a theory from the data, a method frequently used is grounded theory. Grounded theory, which developed from Glaser & Strauss (1967) allows for many different forms of data collection and emphasises procedures for developing concepts, which allow the construction of theory from the bottom up. In other words, the theory will be constructed from the data. It involves three kinds of coding: open, axial and selective (Glaser & Strauss, 1967). The development takes place simultaneously as the analysis of the collected data in order to find a theory that will explain general features of studied phenomena (Myers & Avison, 2002). An alternative is thematic analysis (Braun & Clarke, 2006) used in this study.

The choice of research philosophy does not automatically determine the design of a research. An interpretive or social constructivist philosophy is not synonym for a qualitative design of the methods used for data collection. This study is a case study, but that does not imply that it by nature must be interpretive (Klein & Myers, 1999).

Therefore, a presentation of the chosen methods for conducting this study is appropriate. Designing a research methodology is essential in order to perform a high quality research. Creswell (2009) describes and discuss three different types of research design: qualitative, quantitative and mixed methods. These methods are not to be looked upon as methods that exclude or are contradictory to each other but more as design that is in one way placed on a continuous line.

Qualitative design is about understanding how people, in groups or individually, act and react to problems or situations. The researcher studies the environment, its inhabitants, culture and tries to interpret the findings in order to accumulate an understanding of the complexity of the studied objects (Creswell, 2009).

Quantitative design is aimed at verifying or falsifying an objective theory, by the use of statistical methods for analysing numbered data. This kind of research, in contrast to a qualitative design, can more easily be replicated and thus validated, by other researchers because it involves precise, measurable, variables (Creswell, 2009).

Mixed methods design is, as the term indicates, the use of both the qualitative and quantitative methods in a study. The purpose of combining these designs is to add valuable understanding to the study. This strategy can be executed in different variations. In the sequential mixed

method, one research method is used for setting the stage for the use of the next method, i.e. a quantitative survey could be the base for a qualitative method using interview. In the concurrent mixed method, the methods are used in parallel and the researcher later merges and interprets the collected data in search for additional information in order to answer the research questions. (Creswell, 2009). According to Venkatesh, et al., (2013) there is a shortage of research using mixed methods in the field of information systems.

This study will use a concurrent mixed methods approach by using a quantitative method and a qualitative method.

The quantitative method will be used in order to collect information for research question 1. As the ambition is to collect as much information as possible from as many teachers as possible on how they use the existing LMS, this method is the most suitable.

The qualitative method will be used in order get information that could be used in answering research question 2. This approach will, with its use of a direct approach to individuals of importance in the project, hopefully give a fuller picture of the contribution from Ambassadors in the training and configuration of the new LMS.

This approach will have impact on the timeline in which the different methods were used in such a way that it was not possible to include the result from the qualitative method before the data collection in the quantitative study was finished. Nevertheless, the two methods may make it possible to draw some valuable conclusions.

3.3 Methods/Techniques for Data Collection

The data will be collected by the use of three different methods; observation, survey and interviews.

The research started in January with an interview of the project leader, follow by the observation of the Ambassadors group in February, interviews of Ambassadors and others in March/April and ending with the survey in April.

Qualitative data collection observations will be used at the training sessions for the Ambassadors and interviews used either in focus groups based on the members of the Ambassadors and/or interviews of other individual project members.

The data collection used Swedish as a language, mainly because it will give a more comfortable situation in the interview situation. Not that a teacher at an academic level are not able to speak and understand English, but from experience it is more comfortable to use the native language in a situation that is not the daily happening. It will also help in eliminating any misunderstanding due to interpretations of concepts and terms used.

3.3.1 Observation

As the training of the Ambassadors was in its final stage when the study started, it was not possible to observe any of the training sessions. The actual observation took place during a four-hour session with the Ambassadors and the project team, when the training of the Ambassadors was finished. In the session, 12 out of 16 Ambassadors participated and were engaged in concluding discussions and presentation of the future actions that the Ambassadors were expected to take part in. The future more general training sessions for all of the teachers were discussed in this meeting, as well. The contribution to the findings in the study of the observation is limited, mainly due to the topics discussed during the limited time presence of the researcher. Nevertheless, the observation gave valuable insights that were useful in the interviews.

3.3.2 Interviews

The Ambassadors were from all of the HKR faculties: Faculty of Business, Faculty of Education, Faculty of Health Science and Faculty of Natural Science. Each faculty consist of a number of departments based on their specific area of science (i.e. Health Science, Nursing, Social Science etc.). The use of an LMS will differ both between the faculties and within the faculties. These differences show in the quantitative data collection, but may also appear in the interview with the Ambassadors.

All participants were invited using the Calendar Invite functionality in Outlook in order to find meeting hours suitable for all of them. The Ambassadors were invited based on their memberships of different Faculties, i.e. all ambassador that belonged to the same faculty were invited to the same meeting. With this setting, each interview session would include 3-4 participants with four sessions. The actual outcome were between 0-3 participants per faculty as the Ambassadors from one faculty did not participate.

The number of Ambassadors participating were six, which is below the target of 50 %. The goal was to collect data for the qualitative part of the research from at least eight (8) Ambassadors.

The Ambassadors were interviewed in order to find out more about how they saw themselves in this implementation project. Questions like:

1. Did you join the group voluntarily?
    a. If Yes, why?
    b. If No, who put you forward and why?
2. What were your thoughts on your anticipated work in the group when you joined?
3. How did you prepare for the work?
4. How many of your colleagues did you talk to before starting the training sessions?
    a. What did you talk about with your colleagues?
    b. If you did not talk to any colleagues, why not?
5. What is the most valuable learning that you got during the training?
6. How do you plan to continue your work in the upcoming weeks?

The above questions are only examples of questions that were be put to the ambassadors in order to clarify how they interpret their role. They are a valuable input to the answer of research question number 2.

In addition, other questions were important to ask the Ambassadors. Questions on how they perceive the support of an LMS in their teaching, and if they have found any shortcomings of the new LMS, that would have any impact on their future teaching abilities.

The format of the interviews was open, using a mixture of the format of Focus groups based on the membership of a faculty and specific questions applicable to all. This since, as stated above, each faculty consist of smaller departments and the use of an LMS and need for teaching support from the LMS most likely varies among the departments in a faculty.

Participants, in total five, in the additional interviews are members of the project management team, the training instructors and a pedagogical developer. The LRC instructors were interviewed with the purpose of clarifying the thoughts behind the chosen approach of training and their thoughts on the result of the implementation.

3.3.3 Survey

For the quantitative data collection, a survey based on a questionnaire was used. The questionnaire contained both open-end and closed questions. The questionnaire was based on the structure used by Griffin & Rankine, (2010), but did also consider other inputs received during the literature review.

According to the latest annual report, HKR has approximately 400 teachers (Högskolan Kristianstad, 2018). The target group for the survey was all of the teachers at HKR. By including all teachers, the ambition was to get an insight on whether the form of teaching, i.e. only campus, only distance or a mix of campus/distance, will influence the use of different virtual (non-virtual) tools as complements to the LMS.

The survey was created with the help of the evaluation software (EvaSys) used at HKR when asking the students to evaluate courses given at the university. The software can also be used in order to create other surveys for other purposes, like this survey.

The survey was structured in three mains sections; Information regarding the survey, General information and Experiences/use of LMS. In the general section questions on which faculty the respondent is attached to and in which environment the teacher teach; Campus, net-based (with a few scheduled meetings at campus) or pure on-line based courses were asked.

No questions were asked about age, gender, professional title (lecturer, senior lecturer or professor) or other specific details that could make it possible to identify the respondent. This was a deliberate action as the intention of the study is not to identify differences in the use of LMS and other tools/systems for the teaching by these factors, but mainly to identify differences in use, if any, by the teachers at different faculties, based on the variance of subject areas in the faculties. This limitation will of course affect the result and thereby be a limitation to any future use of the collected data.

For the questions on the experience and use of an LMS, please see the appendix B for more details.

By the use of the internal mail system at HKR, 386 teachers were sent an invitation to participate in the survey.

The survey was first sent to all members of the Faculty of Business. There were two reasons for doing that; one reason being the need for a test of the group mail functionality of Outlook and the other reason being an expectation of getting some immediate response from members as they are located in the same building as the researcher which could give the opportunity for spontaneous feedback. As it turned out, some comments were made that led to a change in the survey questions. An option of “Use No Other” was introduced in the question related to the use of various tools in education.

Due to this change two surveys were created, one for the Faculty of Business and one for the other three faculties. As a result the analysis will have to consider both surveys, which will have an impact on the time and effort used for the analysis.

3.4 Methods/Techniques for Data Analysis

In this study, uses two types of data collection. One quantitative method based on a survey and one qualitative methods based on interviews and observation.

3.4.1 Data analysis survey

The survey use the following topics:

1. General information on occupation and experience on teaching in different environments (Campus, On-line)
2. Experience from the use of an LMS
3. Use of software/systems outside of the LMS to support teaching
4. The influence on teaching methods of the transition to one LMS in 2014
5. Use of social media when teaching

The questionnaire contains closed questions based on a Likert scale (or other given alternatives) and open-end questions that gave the respondent an opportunity to answer more freely.

The questionnaire was set up as a digital form and a link sent to 386 of the teachers at HKR, including the Ambassadors.

3.4.2 Data analysis interviews and observation

The collection and analysis of the data followed four steps, collection, organisation, reduction and analysis. The predetermined research purpose and the theoretical framework guided this process and was helpful in decisions on what to emphasize, minimize and eliminate from further study. The objective was to reduce the data without eliminating anything that was relevant to the study. Practically, the data reduction took place during the transcription of the interviews. Transcribing data that dealt with the key elements of the study resulted in roughly 60 pages. The original audio files are archived for future reference.

The study uses a thematic approach to analyse the qualitative data. Thematic analysis is a method for analysing qualitative data in order to establish and interpret useful key patterns or "themes" (Braun & Clarke, 2006). Thematic analysis is flexible and can be used independently of underlying theoretical and philosophical positions. The method make it possible for the researcher to fine-tune the research questions based on the findings in the analysis. The identification of a theme is based on its relation to the actual research question and the ability to capture important information in the data. It relies on the judgement of the researcher when determining the actual theme. It also put the researcher in the role of actively identifying and selecting the themes. Themes does not "emerge" or are "discovered", instead they are a result of the researcher perception of importance to the study (Braun & Clarke, 2006).

In order to do thematic analysis, the researcher need to establish the approach to identifying the themes. It can be done using an inductive or a deductive approach. The inductive approach is a process in which the coding of data is not based on the researcher´s preconceptions. The analysis is data-driven. The deductive approach is more reliant on the researcher´s theoretical interest in the area. The analysis is analyst driven (Braun & Clarke, 2006).

The choice of using thematic analysis is based on the need for a flexible method with a little freedom for interpretations, and as the ambition is not to develop any new theory based on the data, the grounded theory was not considered appropriate.

The thematic analysis will be carried out according to the model introduced by Braun & Clarke (2006) in six phases;

1. Familiarizing with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

The **Familiarizing with the data,** is important, as it will enable you to see all the aspects of your data. Active repeated reading of the data, searching for meaning or patterns, is familiarization. If, the data is collected via recorded interviews, the transcription of the recordings will provide excellent opportunities for familiarization.

After having done the familiarisation, the work of **generating initial codes** starts. Building on an initial list of ideas generated during the familiarisation, the identification of suitable codes to use for creating themes at the later stages. The codes will be affected by the researcher´s approach, inductive or deductive. Important to remember is that generating as many codes as possible will be beneficiary in later stages, as new interest can develop at later stage, and that

an extract used for one code could be useful in a number of themes. In short, be generous when generating your codes.

Searching for themes is the next stage, in which you sort your codes into potential themes, by analysing the codes, the data attached to the codes, and reflecting on their potential use. Trying to identify the relationships between codes and between themes, will help in creating main themes and sub-themes.

By **reviewing themes** created in the previous stage, the refining of the themes starts. The reviewing will result in themes that are given meaning when used together and that are clearly distinguishable from other themes. It also means that a reread of the data must be done in order to find out if the themes work well in the data set and to find out if there are data that were missed in the coding stage.

In the next stage, **defining and naming themes,** the essence of the themes are defined, i.e. what is the themes about and how does it capture the data. In this trial for a story told by the theme, it is important to establish the position of that specific story in the overall story of the data. At the end of this stage, there will be a clear picture of what the themes are and are not.

Then, the final stage of **producing the report** starts. The report should give a relevant number of examples, extracts, of the themes that are used in the analysis, thus making it possible for the reader to identify its significant contribution to the study. This is accomplished with the help of a story, that explains and make argumentation to the story.

All collected data, including the open-end questions in the survey will be analysed using thematic analysis. The recordings from the interviews will be transcribed and as such, in combination with the answers given in the open-end questions in the survey, provide the first overall picture of the data.

3.4.3 Derivation and identification of themes.

The collected data from the qualitative part of the survey and the interviews were examined using a thematic analysis approach. The derivation of themes followed the following procedure.

It started with an analysis of the data by applying open codes to the data, in which no strict rule to the definition of code were applied. The codes were based on the pre-knowledge from previous experiences of the researcher, the theories read during the study, and the research questions. The ambition was to be as open as possible, but within some boundaries of theory and practise. Re-reading of the data in order to check the relevancy of the coding was done when the preliminary body of codes had been established. The final list of relevant codes are summarised in table 3-1.

The next step involved a read-through of the data in order to find appropriate themes for summarizing all data created with the use of the codes. The first initial themes were set during the coding phase with the research questions in mind. A read-through gave the final themes, after an analysis on how they would help in the answering of research questions. See table 3-2 for the final list of selected themes and their definition.

‘Theme Ambassadors’ considers the role the ambassadors played in the implementation project. Getting an understanding of how the Ambassador worked during the project, how they was trained, their motivation for accepting the role , their expectations on their role and what kind of input they gave the project is vital.

‘Theme Implementation’ describes various aspects of Change Management that could be influencing the implementation, thus influencing the future use of the new LMS and incorporates different perspectives on the demands relevant to an implementation of a new

system, i.e. configuration, influence on educational structure, support and students as expressed in the survey and during the interviews..

'Theme Major Concerns' tries to gather all the concerns in regards of the implementation of Canvas as expressed by teachers, project management and ambassadors. These concerns might have an impact on how the teachers choose to act when encountering the new system in connection to their first actual use in a course.

'Theme New System' incorporates different perspectives on the demands relevant to an implementation of a new system, i.e. configuration, influence on educational structure, support and students as expressed in the survey and during the interviews.

Code	Definition of code
Ambassador activities	The activities performed by an ambassador in regard to the perceived role!
Ambassador expectations	The expectation that an Ambassador had or the expectations that was put on the Ambassador!
Ambassador input	How the Ambassadors gave input to the project
Ambassador motivation	The motivation for a respondent to join the Ambassador training
Ambassador role	The role of the Ambassadors
Ambassador training	The training sessions for Ambassadors
Attitude to Change	The personal attitude to change
Backup when closing	The perceived and actual backup needed by the end of 2018
Canvas configuration	How the configuration of Canvas is/will be affected.
Change Management	How Change Management was handled during the project
Experience from 2014	The experience from taking part in the LMS transition in 2014
Extra work	The perceived need of extra work and/or extra time
Pedagogy	The use of pedagogy
Procurement process	The process of the procurement
Professional background	Describes the professional background of the respondent.
Professional role	Describes the professional role of the respondent
Project Management.	The overall concept of management of a project.
Reasons for change	The given and/or perceived reasons for changing to Canvas,
Structuring education	The how and why on how to structure a educational setup
Students	The relationship to students.
Support	Support regarding system in use.
Systems used	The systems used in various task performed
Training in general	General comments on training
Transition to a new system	How the transition to a new LMS will be done
Type of courses	Type of course that is taught!
Use of LMS	How the LMS is actually used.
Use of other tools	Use of other tools than LMS

Table 3-1 Final Codes used

‘Theme Pedagogy’ covers the pedagogical perspectives in the research, with the ambition to give an understanding of how the implantation would influence future pedagogy used by the teachers.

‘Theme System Literacy’ is a very broad theme that covers previous experience of systems and implementations, the use of LMS in particular and the use of other tools in an educational perspective, i.e. in courses taught by teachers.

Theme	Definition of Theme
Ambassadors	How the Ambassadors worked and influenced the Implementation
Implementation	Various aspects of the Implementation
Major Concerns	Major concerns in the Implementation
New System	Various perspectives on the new LMS.
Pedagogy	Various perspectives on pedagogy.
Systems Literacy	Various perspectives on systems literacy and its influence on other themes.

Table 3-2 Final version of Themes

The final step was to incorporate the appropriate codes to each individual theme, which can be seen in table 3-3.

Theme	Corresponding code(s)
Ambassadors	• Ambassador Activities • Ambassador Expectations • Ambassador Input • Ambassador Motivation • Ambassador Role • Ambassador Training
Implementation	• Attitude to Change • Change Management • Procurement process • Project Management. • Reasons for change • Canvas configuration • Structuring education • Students • Support
Major Concerns	• Backup when closing • Extra work • Training in general • Transition to a new system
Pedagogy	• Important to have • Pedagogy • Professional Role and Background • Type of courses
Systems Literacy	• Experience from 2014 • Systems used • Use of LMS • Use of other tools

Table 3-3 Themes and their corresponding codes.

3.5 Validity and Reliability

When doing research it is important to secure the validity and the reliability in the results from the analysis of the collected data (Hart, 2005). This section discuss the implications on validity and reliability of the study.

3.5.1 Validity

In this study the intention is to identify factors of more general nature and/or factors that might be specific for a specific subject area or the type of teaching (campus/online) that is given. The identified more general factors might be useful (valid) in other implementation projects or research on teaching methods when using an LMS, whereas the factors that are unique for this case study might help in explaining the chosen way of conducting the implementation project in this case study, i.e. valid only in this context.

3.5.2 Reliability

Making sure that the data collected will be reliable, i.e. you will get the same or similar data when conducting data collection at different times under similar conditions is essential for a researcher (Hart, 2005). Doing interpretive research might not be repeatable, as the result will depend on the influence of the researcher in the specific research situation, for instance during an interview and the interpretation of the result made by the researcher. Other researcher might not conduct the interviews in the same way and they might interpret the result differently (Oates, 2006).

This research was conducted during a short interval of time, where the data collection was based on the available sources during that specific time. The reliability of data collected from the Ambassadors that are subject to interviews might not be high the longer time passes. The closer to the actual work conducted by the interviewed Ambassadors the interviews will take place, the higher the value of the data. Thus, making a second interview a couple of months later might not give the same data from the interviewees. The same consideration is valid when it comes to the data collected in the survey. A new survey, one year later, might not give the same result, at least not in the qualitative units of the survey.

3.6 Ethical considerations

Ethical Advisory Board in South East Sweden (2017) states that according to law, research on human beings should be subject to approval before start. The research conducted as a thesis during studies at HEI on ground level or advanced level is not subject to formal approval, but recommendations are to seek advice from an ethics board, like the “Ethical Advisory Board in South East Sweden (Ethical Advisory Board in South East Sweden, 2017).

This study does not have any activities that could affect the participants physically or psychologically, nor does it collect any sensitive data on the participants. The participants are not minors (children). As such, this study would probably not need to seek approval. However, there are some issues to consider, the necessity for anonymity, confidentiality, informed consent and the storage of collected data and research material.

This study is dependent on the voluntary participation of teachers and other personnel at HKR. As all of them are colleagues, directly or indirectly, to the researcher, it is important to safeguard a positive attitude before, during and after the study. Therefore, the study will have to guarantee the confidentiality of the participants. This will be accomplished by making the questionnaire and the result from the observations and interviews confidential, in the sense that only my supervisor and I will have access to the material. It was not possible to grant anonymity of the interviewees towards the researcher as the interviews took place face to face. For the participants in the survey, total anonymity was achieved, as no data on age, gender, professional role or other kinds of data that could be used for identification was collected. All participants were informed about the background and purpose of the study, either in the information given when taking the survey or by signing the “Informed Consent form” when participating in interviews. See appendix C for the specific form used.

According to the Swedish Research Council (2017) the following rules should be applied to this study (Swedish Research Council, 2017, p. 10):

1) You shall tell the truth about your research.

2) You shall consciously review and report the basic premises of your studies.

3) You shall openly account for your methods and results.

4) You shall openly account for your commercial interests and other associations.

5) You shall not make unauthorised use of the research results of others.

6) You shall keep your research organized, for example through documentation and filing.

7) You shall strive to conduct your research without doing harm to people, animals or the environment.

8) You shall be fair in your judgement of others' research.

To the best of my knowledge, these rules have been followed. There are no commercial interests in this study, the findings of other researchers are duly noted when used, no judgement have been passed on others research, all methods used and relevant result are accounted for.

4. Empirical Findings

This section, present the results from the conducted study. The base for the presentation of findings is the method for data collection, i.e. survey and interviews, with the survey divided in two parts, a quantitative analysis and a qualitative analysis. The quantitative findings is as an account for a current state report on the experiences of different teachers in regards of teaching, use of LMS in teaching and implementations or change of an LMS. Thus giving a background for the more elaborate analysis of qualitative data.

The sections starts off with a presentation of the actual case studied, as this will help the reader understand the findings and the discussion of findings in later sections.

4.1 The LMS implementation project used in the study.

4.1.1 Background and previous projects

In order to understand the research setting, this section present information on various projects for implementing a new LMS at HKR. The presentation builds on the following sources: Larsson (2017), NORDUnet (2016) A (2012), B (2012) and interviews with project management.

During 2014, HKR changed their use of LMS, by focusing on using one (1) LMS for all the faculties and all the courses given in the departments. A transition from the use of one or more LMS, to the use of one single LMS, one that probably was unknown to some teachers. This LMS has been in use since then, but the use of new LMS takes place during the summer of 2018.

From an historical point of view, a project with the ambition to develop a new digital learning environment started well before the project that implemented It'sLearning as an LMS for all faculties and courses in 2014. A project for a new digital learning platform started in September 2012 with the establishment of a project group and project planning sessions. The aim for the project was to either procure a new propriety LMS, or implement an open-source LMS, or use a solution build on other available tools. The new digital learning environment was to start in the fall of 2014, which meant a project time over two years.

The project plan followed the structure of SDLC in stages, with these identified actions; start of project, gathering of demands on the new system, remissions of the lists of demands, requirements for procurement, procurement, choice of new learning platform, establishment of a test environment, education of users and implementation of the system and final deployment of system in all courses.

The gathering of demands for the new solution resulted in two list of requirements, one technical and one pedagogical. The pedagogical lists contained 20+ demands, among them, demands for asynchronous and synchronous communication, teachers administrative tool, use of media, mobility (use of mobile apps, use of portfolios and blogs, student progression, FAQ, message boards, collaboration, calendars and schedules, analytics, traceability, and migration. Teachers participated in the discussion.

In the autumn of 2013, the project management took a decision to implement It´sLearning as the new LMS and the original project to develop or procure a new digital leaning tool stopped. This new project in three phases, preparation, implementation and closing of the old LMS systems used, lasted from August 2013 to December 2014. In the preparation phase representatives from LRC, student administrators, IT-service and communication department participated. In the implementing phase, starting in December 2013 and ending in September 2014, a number of sub-projects took place. The sub-projects dealt with system development, arranged information meetings, performed education of teachers new to It´sLearning, discussed issues regarding student administration, discussed student access and involvement, and

negotiations with the unions. In January 2015, the project ended with the use of the LMS throughout all faculties and courses.

Due to EU regulations, a new project for procurement of an LMS started in 2016. Through an ongoing dialogue with SUNET, Swedish University Computer Network, a discussion of participating in a centrally administrated procurement project took place. These discussions resulted in a procurement project in collaboration with NORDUnet, a collaboration of National Research and Educational Networks in the Nordic countries, in 2016. The procurement project started in September 2016 and completed in January 2017 awarding Instructure, with the LMS Canvas, the contract for the LMS to use by Swedish Higher Educational Institutions.

4.1.2 The implementation project in the study

The implementation project of Canvas at HKR started in 2017. The plan was to implement the new LMS, during 2017 and the beginning of 2018, in order to have the system operational by August 2018 when the autumn semester starts. Figure 11 give a schematic overview of the planned execution of the project. A complaint from one of vendors not awarded the contract, delayed the project approximately eight months. The pilot project and other activities started in late January 2018.

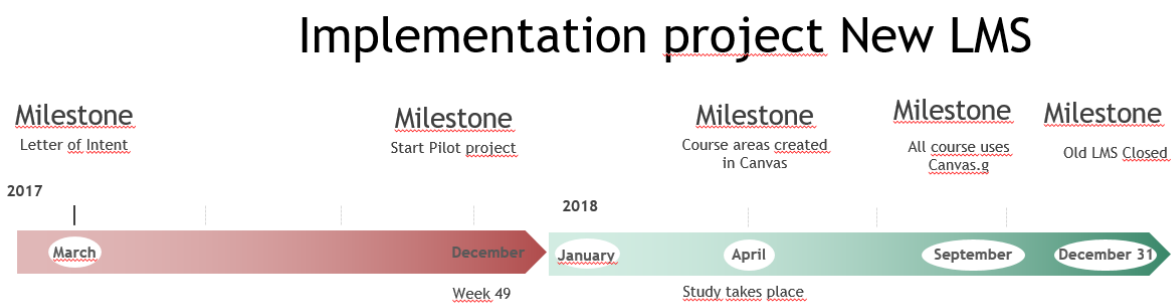

Figure 11 The projected time plan for implementation of Canvas. Source: Adopted from Larsson (2017)

The project consists of smaller subprojects. These are:

- The ending of It´sLearning (Old LMS System)
- Contract SUNET
- Contract Infrastructure
- Integration and Automation
- Configuration of Canvas.
- Education and support to teachers
- Ambassadors, Reference group and pilot project.
- Internal marketing of Canvas.
- Canvas as a common channel for contacts at HKR
- Education in net based teaching

All of these subprojects have an influence on the result of the project. The ending of the old LMS system puts constraints on how available the old system is in the context of for how long extraction of material and information is possible. The contractual issues determine the extent to which the project management team will get support during the implementation. The integration and automation determines activity support after the implementation. The optimal configuration of Canvas is a vital part of the implementation, as it will influence the future work in the system. This applies to the education and support to teachers as well. The role of the ambassador are equally important. In the project document (Larsson, 2017) the role of the Ambassadors are describe like this:

The project links employees who can serve as local ambassadors for each program. The role of the ambassadors is to help their program colleagues getting started. The ambassadors are linked together in a common reference group. The purpose of the reference group is to serve partially as an arena for the exchange of experience among the ambassadors, and partially to give the project group feedback on how the implementation works, the experiences from education and what opportunities and difficulties the teachers encounter.

In addition, the internal marketing of Canvas will influence the project. The intention of the internal marketing project is to:

Communicate the change of learning platform at the university by creating curiosity, calmness and openness for the new learning platform. Communication should make employees feel secure before the change; both with the project group and with the learning platform itself. Through good communication, we try to highlight the challenges a change entails and focus on opportunities with a new learning platform linked to online-based learning. Larsson (2017).

The influence of the last two subproject are minor in respect to the short-term perspective of how it affects the teacher as a group directly in their teaching after the implementation has ended. However, for the long-term effect, it might be of interest.

According to Larsson (2017) the ambition and the identified success factors of the project are:

- The university will have access to a new and fresh system for teaching and educational administration that all trained staff are well acquainted with.
- In connection with the change of system, new and future-oriented discussions take place throughout the university about what opportunities we have today to teach using modern technology.
- The employees increase their knowledge of online education through collaborations and skills development that goes beyond knowledge of the system's functions.
- The opportunities to cooperate with other universities that have the same system are strengthened as many switch to one and the same LMS simultaneously. This has positive effects on issues related to learning, teaching, technology and administration.
- The teachers feel that they have gained access to an excellent system for teaching and the students' digital environment is improved.
- The agreement with Canvas takes in account the future closure and withdrawal of existing data from the system than previous agreements made.
- The costs compared to the previous learning platform significantly reduced.

4.2 Findings from the Survey, part A (Quantitative)

By the use of the internal mail system at HKR, 386 teachers received an invitation to participate in the survey.

The overall response rate of the survey by April 18 is 30 %. A response rate of 30 % is good. For surveys it´s common to have response rates as low as 10 % (Oates, 2006, p. 99). One action taken in order to get a higher response rate was to send the survey to all teacher a second time. Other strategies for increasing the response rate have not taken place.

The response rate for the different faculties shows that the range of response rates are wide, from 21 % to 55 %.

4.2.1 General overview of Teachers´ experience of LMS systems

This section, present the results on the teacher's general background, their experiences from a change of an LMS and their expectations on a new LMS. The experience of using an LMS system are high among the teachers. More than 78 % of the teachers have five or more years' experience.

As the university is in the process of changing the current LMS system to a new system, it is interesting to know something about the teacher's experience of different software for LMS. The findings show that many of the teachers have experience of other LMS systems than the one used at HKR

First Class, Moodle and It'sLearning are the most recent LMS used at HKR. In the transition to one LMS at HKR in 2014, It´sLearning stopped the use of First Class and therefore, the high value for It'sLearning is as expected.

HKR\LMS used	First class	It´sLearning	Moodle	PingPong	Blackboard	Luvit	Other
Total	39	114	66	70	74	61	11

Table 4-1 Teachers Experience of different LMS Software

Another interesting aspect is the type of courses the teachers teach. This survey used three different course types, On campus, Net based course (mostly online, but with some sessions at campus) and pure On-line courses.

The participants indicated their participation in teaching based on these three types, in the range from 0 % to 100 %. The variety between different course types is wide.

A total of 33 (29,7 %) teachers are engaged in campus courses only, with a variety among teachers at different faculties. The faculty of Natural Science have the highest portion of teacher doing campus courses only (43,4 %) while the Faculty of Business have the lowest portion of teachers doing campus courses only (16,7 %).

In regards to how many of the teachers that are engaged in teaching on net-based or pure online courses, the numbers are considerably lower. Only nine out of all the teachers do teach in a net-based or pure online course only.

This indicates that 74 (63,7 %) teachers do participate in mixture of course types.

Griffin & Rankine (2010) split functionality of an LMS in the four functional quadrants of

a) Communication and Collaboration,
b) Content Resources,
c) Site management
d) Evaluation and Assessment.

The teachers described their use of an LMS in view of these quadrants (the text that follows use the term functionality as an equivalent term).

A small minority of teachers, 15, do only use the LMS for delivering content. 40 teachers only use one functionality in the quadrants, 24 teachers use two functionalities, 15 teachers use three functionalities and 24 teachers use all the functionality.

According to this the most used functionality among the teachers is "Communication and Collaboration" and the least used functionality is "Evaluation and Assessment".

The usage of the LMS for communications depends on the type of course. In courses that are net-based or pure on-line courses, the communication functionality is considered to be essential,

whereas in the campus courses the communication can be done face to face with the students, hence the LMS is used less for communication in campus courses. As one teacher put it:

> *"When the platform supports campus teaching, communication is not particularly important in the platform."*

A teacher, who only does teaching in purely online-courses, contradicts this:

> *Communication - simply because it is so fundamental and important aspect an teaching.*

Most of the teachers doing only campus courses express the view that the Management functionality and the Content functionality are equally important. One teacher expresses this like this:

> *"Mainly document management, i.e. distribution of materials from me to students and vice versa, handling of assignments, exams etc. from them to me, including the administration of these documents, such as clearing marks and any grades on submissions."*

The usage of the Evaluation functionality is not as frequent as for the other functionalities, but the explanation lies probably in the used methods for assessment at campus courses, where the examination in many cases takes place in the classroom, thus making the LMS superfluous, as expressed by a teacher:

> *"Distance learning courses build very much on communicating with the students. In addition, we use the platform to graduate students and I do not do it on campus courses."*

From a pedagogical perspective very few comments were made, perhaps because the teachers do not think of the possible need for different approaches to teaching due to the actual course types, i.e. it´s only the stage that is changing, not the content and its distribution, as illustrated by this comment from a teacher:

> *"I have the same layout for a distance course as a campus course. But for the campus courses I have presentations and supervision in the lecture room".*

4.2.2 Teachers' experience on changing an LMS

Most of the teachers (75,4 %) at HKR have experiences from participating in a project concerning a change to a new LMS system.

The teachers were asked about their experiences from taking part in a project where a new LMS was implemented or a change from one LMS to another LMS took place. The answers were given regardless of whether they had participated in the change of LMS at HKR in 2014 or they had participated on projects elsewhere.

None of the teachers perceived the change project as something very negative. Although 18,4 % of the respondents did not complete this part of the survey, 75,4 % of the respondents were of the opinion that the change had no special effect, only a somewhat positive effect or a very positive effect on them. (See table 4-8).

4.2.3 Use of other tools

This section, presents the findings on which tools that teacher uses in their teaching efforts. The teachers received some suggestions on which tools to consider for different purposes, but also the opportunity to list their use of other tools. The presentation uses the four quadrants by Griffin & Rankine (2010) as a base.

4.2.3.1 Tools for communication

Approximately 15 % of the teachers uses no other tool as a complement to the LMS when fulfilling their needs for communication.

Although this is not the case in the Faculty of Business, as all teachers use a complementary tool for communication. The Faculty of Natural Science, on the other hand, has the highest number of teachers (34,8 %) that not use any other tool than the LMS for communication. The tool most used is Microsoft Outlook, used by 50 % of the teachers. A high number of teachers also uses more virtual tools like Adobe Connect and Skype. Approximately 11 % of the teachers use other tools.

4.2.3.2 Tools for management

When it comes to the usage of tools for management, the teachers were given suggestions of three tools, which are systems that support teachers when managing their course. These tools are Urkund, EvaSys and LADOK.

Software	Faculty of Business	Faculty of Health Science	Faculty of Education	Faculty of Natural Science	Missing	Total
Number of answers	36	28	27	23	2	116
Use No Other	0	5	3	3		11
Urkund	13	13	17	13		56
EvaSys	13	16	14	9		52
Google Docs	10	2	3	2		17
Microsoft Office	22	6	5	12		45
Microsoft Outlook	17	7	6	10		40
LADOK	26	18	18	18		80
Other	3	0	2	3		8

Table 4-2 Teachers use of tools for management according to model by Griffin & Rankine (2010).

As can be seen in table 4-2, many teachers uses these three system, but not all. The range of usage for these tools varies from 44 % to 69 % in the overall usage. When looking at the different faculties, the range varies from 36 % to 78 %.

4.2.3.3 Tools used for distribution

When it comes to the tools used for distribution of content, the given suggestion for tools was based on the pre-knowledge of tools used by teachers at HKR. (See table 4-3).

As for the other purposes, the "Use No Other" varies; in the Faculty of Business, all teachers' uses tools to supplement their distribution of content, whereas in the Faculty of Health Science more than 40 % uses only the LMS for distribution of content.

Among the tools listed are YouTube and Links to Internet. Approximately 33 % of the teachers uses YouTube as a tool to distribute content. From the survey it cannot be established whether this usage is based on producing content on their own and then publishing it via a channel at YouTube or it just mean that they create links to content published on YouTube.

The use of "Links to Internet" are in the range of 40 % to 58 %, depending on which faculty the teachers do belong. Approximately 10% of the teachers uses other tools in order to distribute their content.

4.2.3.4 Tools used for assessment

When it comes to tools used for examination four different tools was given, based on the pre-knowledge of systems used. The most used tool is Urkund, which is used for control of plagiarism and Microsoft Office. (See table 4-4).

Software	Faculty of Business	Faculty of Health Science	Faculty of Education	Faculty of Natural Science	Missing	Total
Number of answers	36	28	27	23	2	116
Use No Other	0	12	8	6		26
Adobe Connect	4	3	5	3		15
Simbizz	3	0	0	0		3
Qlikview	1	0	1	0		2
Visma	1	0	1	0		2
SAP	0	0	0	0		0
Kahoot	4	1	1	0		6
Camtasia	10	7	4	5		26
Kaltura Desktop Recorder	1	0	0	1		2
YouTube	15	10	5	9		39
Google Docs	6	0	3	1		10
Microsoft Office	6	4	8	7		25
Microsoft Outlook	9	7	6	10		32
Links To Internet	21	13	11	10		55
Other	5	1	3	3		12

Table 4-3 Teachers use of tools for distribution according to model by Griffin & Rankine (2010).

Software	Faculty of Business	Faculty of Health Science	Faculty of Education	Faculty of Natural Science	Missing	Total
Number of answers	36	28	27	23	2	116
Use No Other	0	13	15	10		38
Urkund	16	11	10	5		42
SPSS	3	5	1	1		10
Visma	0	0	1	0		1
Microsoft Office	16	7	5	8		36
Other	6	0	2	4		12

Table 4-4 Teachers use of tools for assessment according to model by Griffin & Rankine (2010).

4.2.3.5 The use of Social Media for teaching purposes

Faraon, et al. (2011) did a survey on the usage of and attitudes to social media in teaching. As the development of social media has developed considerably during the last five years, the pedagogical attitudes towards the use of social media in teaching could have changed. Therefore, asking the teachers about their usage of social media in their teaching would give some indication of this. (See table 4-5).

More than 75 % of the teachers do not use social media in their teaching. The range is between 61 % (Faculty of Business) and 85 % (Faculty of Health Science. The most used social media are Facebook and Wikis.

Software	Faculty of Business	Faculty of Health Science	Faculty of Education	Faculty of Natural Science	Missing	Total
Number of answers	36	28	27	23	2	116
Do not use Social media	22	24	23	19		88
Facebook	3	2	1	1		7
Twitter	1	0	0	0		1
LinkedIn	1	0	0	0		1
Instagram	3	0	0	0		3
Blogs	5	1	1	0		7
Wikis	4	0	0	1		5
Other	1	0	1	2		4

Table 4-5 Teachers use of social media for teaching purposes

4.3 Findings from the Survey, part B (Qualitative)

The survey to the teachers had a number of open-end questions. The questions were:

- What purpose is the most important thing for you to get support from a learning platform for in your teaching? Administration, Communications, Distribution, Examination?
- Does your use of learning platform differ depending on the type of teaching you are doing? E.g., do you use the learning platform for other purposes in a campus course than if you are doing a distance course?
- What was the main reason for your answer above? (Answer to the question: How did you experience the transition or implementation of a new learning platform?).
- What was the main impact on your teaching that the transition or implementation platform had? (*In relation to the experience of previous transitions and/or upgrades.)*
- What is the most important thing for you and your teaching, to consider in the transition to the new Canvas learning platform?
- What is your biggest concern or fear regarding the transition to the new LMS Canvas?

The answers given by the teachers to these questions are analysed by using the defined themes:

- Implementation
- Major Concerns
- Pedagogy
- Systems Literacy

The analysis did not identify other themes. The 376 quotations taken from the open-end questions in the survey sent to the teachers constitute the base for analysis.

4.3.1 Theme Implementation

As a project management issue, the teachers pointed out that the implementation of Canvas was not the only project that needed attention. At least one other system used by teachers, mainly those with a course responsibility in their daily role, had an implementation project running in the same period. This led to comments on the coordination of different projects at HKR. In addition, the necessity of Canvas being accessible to the teachers were commented on. One teacher expressed like this:

> *"Timing! In addition to our daily work, one cannot assume that we can attend courses in (and work with) several systems for a short time."*

Another aspect found in the answers, were a somewhat positive attitude towards the change to the new system Canvas. The following citation from a teacher summarize the main attitude. The teacher commented on previous experience on implementation of a new system:

> *"If the purpose is access to a better platform and this has proved to be the case, it is positive even if it involves some additional work at the transition."*

Simplicity, flexibility and a perceived usefulness for students in an LMS are important features identified by the teachers. Students seem to have changed habits, from attending classroom lectures to using the LMS as communication tool instead, thus creating new demands for the LMS and the teacher.

The internal support of new system is important. Being able to get introductions, examples to use when setting up a course, recommendations for specific task and a timely support from IT-pedagogical personnel is issues that the teachers mention. A good structure for giving support during the project will make the teachers more apt to adopt learn the new system and getting started with courses in the system.

4.3.2 Theme Major Concerns

One concern of the teachers were the level of extra work that they have to do, in order to be able to handle their courses in the new system as of the fall semester. Many of the teachers expressed a concern of not having enough time to learn the system and learn how to structure a course in the new Canvas.

> *"Extra work - creating new structures requires thought before (Canvas is still an unknown area!), during and after ... and thoughts take time!"*

Another concern expressed by the teachers was the training in the new system, based on the need for identifying a suitable structure to use in a course. The teachers express a concern of not being able to structure the courses in the new system due to limited functionality or other limitations set by the system. One teacher expressed this concern like this:

> *"...the platform will decide on how we can work"*

The major concern for many teachers were how to make the transition from the old system It´sLearning to the new system Canvas. Transition in the sense of getting material used in the old system transferred to the new system, but also the need to have access to assessments and grading performed in courses delivered in the old system. As the transfer of material has to be done manually, this will also affect the time spent by the teachers in order to be prepared for the start of a course in Canvas.

4.3.3 Theme Pedagogy

There were very few comments on the pedagogical aspect of the use of the new LMS. One respondent mentioned that the time to do teaching affected the effort needed to learn the new system. One teacher responded that the actual practical use of the system have changed, but not the underlying teaching.

Only one teacher commented on the opportunity to adopt to new teaching practises.

The opportunity to let students view lectures via the network.

Do ”test yourself” tests.

When I was familiar with It’sLearning and after the number of updates, I found or got tips on different uses that made the education easier and more fun.

The introduction meant a new system better suited for teaching and had more opportunities to do something good. It is also interesting to make a change because it gives a few new ideas about what to do and forces some changes. Enforced changes can be both good and bad.

4.3.4 Theme System Literacy

In regards to the previous experiences from the change of LMS in 2014, teachers appreciated the internal support from the LRC alongside easily accessible information as it facilitated the transformation in a positive way. Although some teachers experienced difficulties at the start-up of the new system and had to put some extra time in for doing things like moving course material from the old platform to the new one and learning the functionality of the new system.

The overall comments were on the fact that the university now only had one system to use and this system was more flexible to work with than the old one.

Great that the entire college got the same system and that FirstClass was scrapped, very cumbersome.

In regard of the various functionalities defined by Griffin & Rankine (2010) comments on the changes were mainly in the area of management of teaching material.

How I could prepare material and make it visible without pushing the button myself.

Configuration of all teaching materials

Adds more (all) teaching material to the courses in its learning. I did not do that before.

In addition, comments on the communication and collaboration aspect of the functionality were on the tools for communication with students where the new system had improved functionality.

Comments from teachers who experienced that the change to a new LMS influenced their teaching very much by are:

- That the courses can get a clear and modern structure with the possibility of communication around different parts of the material and the course.
- That the possibility of using Canvas can provide opportunities for improvement of materials and courses. To get time (hours) for the time it takes to change.
- Getting support of the LRC
- That I have time to move / save materials and put everything from the ground up in Canvas.

Comments from teachers who experienced that the change to a new LMS did not influenced their teaching at all are:

- Have not even thought about it or that there would be a problem
- It would be very nice if Canvas allowed to report the grades which are automatically forwarded to Ladok (in other words, without reporting grades twice).
- Does not look like it affects my teaching, just my administration.

4.3.5 Overview of quantitative empirical findings in survey

The findings from the qualitative part of the survey are summarised in table 4-14. The summarisation is an indication of the result from a teacher perspective, but not a comprehensive account for all the comments given. Other researcher might interpret the comment from teachers differently.

Themes	Findings
Implementation	• Parallel implementation of systems might create conflict. • New system early availability is a factor that could influence the success of the implementation. • Identified demands for simplicity, flexibility and student usability. • The support from IT-pedagogy when implementing a new system is crucial. • A slightly positive attitude towards the project among teachers.
Major Concerns	• Extra work is expected. • Getting the proper training is important to the teacher. • Being able to structure a course in the new system is vital for the teacher. • The transition of material from the old system to the new system is important, but it will create a lot of work.
Pedagogy	• A mixture of no change to pedagogy and seizing the opportunity to change pedagogy
Systems Literacy	• Support needed for transition of material from old LMS to new LMS • Using more of functionality in the new system

Table 4-6 Summary of findings in survey

4.4 Interviews with Project Management and the Group of Ambassadors

This section, presents the findings from the conducted interview with members of the project management and the group of Ambassadors. The presentation will build on the themes identified and presented in section 4.4

Interviews with members of the project management team, the LRC training instructors and one pedagogical developer took place after the training of Ambassadors. Although the pedagogical developer did not have a specific role in the project as such and only participate in the training sessions for the group of Ambassadors, the findings from that interview contribute to the overall picture of the project.

4.4.1 Theme Ambassadors

First, a definition on the term Ambassador is in order. Apart from the more obvious interpretation of an Ambassador as a person within the diplomatic services of a country/state, there are other uses of the term. According to Wikipedia (Wikipedia, 2019), "*The word is also often used more liberally for persons who are known, without national appointment, to represent certain professions, activities and fields of endeavour such as sales."* which give the user the opportunity to interpret the term more generically.

From the project management perspective, the term Ambassadors and how to use them, was not something that was included from the start of the project. The concept developed during the project for different reasons, like the need for someone that had the practical knowledge on how to teach with the help of an LMS and the need for creating a knowledge on the functionality of

the specific LMS, Canvas. Also, as a tool for implement a positive attitude towards the change of LMS, expressed like this:

> *I just think that ambassadors should be a little more positive. You should like to cheer for the system!*

The Ambassadors were not expected to do any training of their colleagues, but they were expected to act on behalf of them in order to encourage them to take courses, and present an overview of the system at department meetings (albeit this demand might be not expressed in all departments), act as inspirer, and being available for questions.

The Ambassadors themselves interpreted the role in different ways. They saw a role of distributers to colleagues, a reference group to the implementers, mentors, actively support and motivate, and create a positive attitude to change. As expressed by one Ambassador;

> *I think the biggest mission with the ambassador course was this with "Calm down the other colleagues". When you came in and told about the system, told about functions they became relaxed and were not as worried about the future development. I think it is really, where our big goal was as ambassadors.*

The reasons for the Ambassadors accepting the role varies. Some saw it as an excellent opportunity to get know the new system real quick, other joined because they had an ambition to influence the implementation, others had a genuine interest for LMS and some were just asked and decided “why not”. The decision whether or not to accept the role as Ambassador was in some cases depending on the “non-training” part. If the role had demanded that the Ambassador trained their colleagues, the teachers would not have accepted the role.

As the reasons for participating and the interpretations of the role varies, so do the activities carried out by the Ambassador. Some posted information boards with links to available videos for training on the old system It´sLearning in order to deliver information to colleagues; others used department meetings for information or participated in lunchroom discussions. The Ambassadors prepared themselves for the participation in the Ambassador training differently. Some accessed the given trial system, thus getting a first impression of the new system, other did not make any preparations at all.

The trainers scheduled three training sessions during a number of weeks for the Ambassadors to participate in. Due to calendar conflicts, not all Ambassadors participated in all of the session, but most of them participated in at least two. The training sessions took place twice a week, Tuesday and Thursday, and had specific content each week. Session 1 introduced the basics of the system, session 2 introduced means of communication and session 3 dealt with quizzes, assessments and some special features. As the system was a new experience to the trainers, the sessions gave all participant an opportunity to explore the functionality of the LMS in a very adhoc structure. The sessions were used by all participants to get know the functionality, both from an LMS perspective and a specific demand of functionality as expressed by the Ambassadors. In a way the Ambassadors, especially those that participated in the Tuesday session were guinea pigs. However, most of the Ambassadors did not experience this as something bad. On the contrary, they saw it as an excellent opportunity to gather new knowledge. The training sessions identified both weakness and strengths in the new system and made the Ambassadors aware of opportunities to implement new pedagogical tools, and made them aware some of the limitations to continue using the same tools as in the old system. From project management perspective, this awareness’s was important to the continuing implementation.

Apart from the questions put in connection with the specific training session, the final session in which almost all of the Ambassadors and members of the project team were present, was the a source of Ambassador influence to the configuration of the new LMS.

4.4.2 Theme Implementation

One major factor that influence the issue of change management is the attitude to change. This attitude is a result of the individual change commence. The interviews gave some insight on the attitude harboured within the Ambassadors.

Some Ambassadors expressed a positive attitude towards the change to a new LMS. They express a trust to the system as such, but indicate that this is not a common understanding among the teachers. Some of their colleagues also have a positive attitude, while others are more negative. The section “Theme Major Concerns” presents in more detail the concerns affecting the attitude negatively.

Using a quote from one of the Ambassadors to conclude the attitude part of the theme:

> *“…the experience I have is; After all, it worked, it wasn't that difficult and I think you bring it with you. It is not that difficult to change. While those who have experienced resistance think "Not another change", they have it more difficult. So, it probably has to do with what experiences one have and belief in the ability of what I can do actually”*

This could be an indication that the attitude is not a result of a technical issue, but a result of previous experiences.

The project team with experience from previous implementation in 2014 did take actions, which they expected would eliminate the anxiety for the Ambassadors and the teachers. One example is the Top-ten list. At the start, they created a Top-ten list of the new systems functionality, thus indicating all the new features that would improve teaching. The list considered of issues identified during the former implementation in 2014, but it also included issues that did not work in the old system. The project team distributed the list to faculties and Ambassadors.

Another aspect that influenced the theme relies on the specific role of the Ambassadors presented earlier. Although they were active and gave input to the configuration of Canvas, some of them expressed a doubt on whether or not they actually had a say in the process. They did not experience any involvement in the change process.

The Ambassadors also expressed some thoughts on the involvement of teachers in the process. Some said that there is a general feeling of lack of involvement among the teachers, i.e. they have not been involved or asked to take part in the process leading up to the final implementation of the new system. The fact that no teachers got an invitation to join the project group until a late stage in the project illustrates this. The project team only contained members from the administrative personnel and IT. The introduction of the concept of Ambassadors took place late in the process. One Ambassador expresses the feeling of not being involved like this:

My feelings are that we are subordinate to a kind of technical development perspective, which does not ask if we should have study-based teaching on the net in 5 years. It is a completely uninteresting issue for them, because they have so much technical problems that they have to solve. With different formats, buttons, and whatever it may be. Which really does not have any strategic bearing, at all.

The interviewees also indicated a lack of knowledge on why the change had to take place. They mentioned reasons like formalities and seizing an opportunity. They did not identify any pedagogic reason; on the contrary, there were questions on why change from a system that

everybody knows and can get support for most of their pedagogical methods in to a system that no one knows.

In the project team there were discussions on how to set up the system generally, i.e. questions on who should be able to set up a test course, how many test courses to allow, who could make invitations to test courses, the use of test students and so forth. In the training sessions issues like announcements, language and authority to do things.

As to structuring education, one Ambassador gave an examples of a structure using folders for assessments built on discussion fora, content and assignment, instructions, educational material and videos. One package for each assessment. Another Ambassador will be using modules as a substitute for folders in the new system.

One of the experiences on how students influence the structuring of education is the change from participating in classroom activities to demanding to get the lecture material published on the LMS. Another influence is the use of other channels for communication between students, for instance they start groups on Facebook.

Students have also showed interest for the new LMS. When that happened, the Ambassador showed the new LMS to the students, but gave no opportunity to test it.

The overall opinion of the Ambassadors is that the support received from LRC is of high quality. The material supplied and its availability were highly appreciated in the old system and the expectations were that this should continue after the change to the new LMS.

4.4.3 Theme Major Concerns

The finding for this theme concerns the backup needed when closing down the old LMS, the expectations of extra work, training in general and the transition to the new LMS.

The old system will come to a definitive end at December 31, 2018 and this is putting demands on both the project team and the teachers, thus creating uncertainties of various kind. Questions like “Will we get all the material needed in time?”; “What should I make sure that I recover?” “And how should we as a project team act in order to support the teachers with this?”

The expected extra work is about finding time to get training, creating knowledge of the functionalities in the new system, extract material from the old LMS, importing the material to the new LMS and to build completely new courses in the new system. Teacher are used to copy material and structure from an old course to a new course, thereby only making minor changes to the course material and structure before the start of a new course. This functionality exist in the new system as well, but as there are no courses to copy from teachers have to start from scratch.

The extraction of material from the old system is depended of the functionality in the old system. One Ambassador had trouble when extracting a file with quizzes, with the purpose to import the questions to the new system, thus getting a delay of 24 hours before the extraction actually took place. This is one example of the kind of extra work that is affecting teachers.

Alongside the implementation of the new implementation of LMS, other implementations run in parallel. These projects will also have an influence on teachers and their time.

In short, time management is the concern that most of the Ambassadors express. One Ambassador put it like this:

> *“It's only; "When shall we have time" because it lies on me, I realize. It is a half-day job or something I need to do. Which I cannot find anywhere. The half day.”*

As for the actual transition from one LMS to a new, the Ambassadors expressed a mostly positive attitude. However, they note the differences in the structuring a course between the old and the new LMS. The way of thinking must change. The new LMS seems to have almost all the functionality needed. On the other hand, some expressed additional support on how to structure a course, for instance with the help of templates.

4.4.4 Theme Pedagogy

This theme present the comments from the project members and the Ambassadors on important features to have, pedagogy, professional role and background and the type of courses conducted.

In order to understand the pedagogical imprints made by different individuals in the project, information on the professional role and background was collected. Among the project members as well as among the Ambassadors, the pedagogical experience varies from very little experience, even unexperienced, to very experienced. The common base for all is an interest for the systems used to support the pedagogy. An interest developed during a number of implementations, the specific area of education and personal development.

The Ambassadors identified some feature important to have in the new LMS in order to facilitate their pedagogy. One feature is the concept of the LMS being a dynamic area in with discussions of various kind could find its place. The LMS should not be just a "dumping area" where to find and download content. Other features are the peer-review functionality and the ability to use milestones in a course. The last feature mentioned was the ability to get an overview of or interaction with students within a programme without having to access a specific course.

One of the Ambassadors mentioned meeting the students face to face as important in earliest settings of courses. However, the change in student behaviour on participating in class and demand for publication on the LMS has led the teachers to a discussion on how to solve this issue. Will our pedagogy improve if we start to use other means of delivering courses? The Ambassador continued by expressing:

> *After all, we believe it is the pedagogical development that is demanded rather than an LMS. However, here it was the other way around. Here we could see that the opportunities that existed digitally made us drive a pedagogical development*

The Ambassador expresses the opinion that it is not the pedagogical idea that drives the use of an LMS, but instead the LMS that make it possible to change pedagogy.

Another Ambassador had some considerations on whether to change the pedagogical approach when changing to a new LMS. One consideration was the adaption to the LMS, i.e. the LMS will set boundaries that could limit the pedagogical idea. The other consideration was the lack of time needed to do this development. One Ambassadors mentioned time management as a vital aspect in the transformation process, and its effects on opportunities to change pedagogy. The availability of time to learn the system, learn how to build a course, and extract material was simply not enough, and the Ambassador would recommend colleagues to settle for a "good-enough" first course.

One Ambassador mentioned the support for student-based teaching, as a vital pedagogical idea.

More or less, all the Ambassadors their courses in all of the three types available, i.e. at campus, net based and pure online.

4.4.5 Theme Systems Literacy

This theme present the comments from the Ambassadors and project members on experiences from 2014, systems used, use of LMS and use of other tools.

The experiences from the transition from two LMS to one LMS in 2014 are positive among the interviewees. There were minor issues that had to do with the use of the former LMS, FirstClass, as it served as an email server and an intranet for the organisation. The split to three new systems, It´sLearning for LMS functionality, Microsoft Outlook for email services and the continuation of First Class as an intranet led to negative experiences. Otherwise, the transition to a new LMS went well, mainly because many teacher used the new LMS to some extent before the transition. In addition, all material used in First Class were still available after the transition, so if teachers needed to retrieve any previously used material, they could always log in to the old LMS and retrieve it.

Teachers at HKR uses a number of systems, see tables above from the findings in the survey. In additions to the systems listed above other systems like Box, a storage software, Padlet, a sharing and communications software, Retendo, a personnel management system and a server formerly used as a content provider for online courses, were identified. This list of systems used, have to add all the subject area software used within the course setting, for instance the software Safe-Doc used in health sciences. This research did not identify all software or systems of this kind.

The uses of LMS varies among the Ambassadors. Some use it mainly as a content manager, thus having all communication with students in classroom, when teaching campus courses. Others use it to present an overall course structure building on all of the quadrants from Griffin & Rankine (2010).

4.4.6 Overview of Findings from the Interviews

The findings from each theme are summarised in table 4-15. The summarisation is an indication of the result from the interviewee's perspective, but not a comprehensive account for all the comments given. Other researcher might interpret the comments from interviewees differently.

Themes	Findings
Ambassadors	• Different interpretation of the role led to different approaches and actions • Different reasons for accepting the role influenced the participation. • A positive attitude towards being a guinea pig
Implementation	• Attitude to change is influenced by previous experiences • Actions were taken to influence the attitude positively • The seemed to be a sense of lack of teachers involvement and/or empowerment • The motivation for change was not pedagogical. • Identified a need for knowledge on how to use functionality for structuring a course. • Identified an students interest in the new system • High quality support from LRC is appreciated
Major Concerns	• The transition of material from the old LMS to the new LMS is crucial • Time management is a major concern
Pedagogy	• Identified new features for creating a more dynamic learning environment. • Support for student based teaching needed. • Different attitudes toward whether or not using the opportunity to change pedagogy at the same time as the change of LMS
Systems Literacy	• Experiences from project in 2014 mostly positive • The actual use of an LMS according to Griffin & Rankine (2010) varies. • The use of additional course specific software in teaching courses.

Table 4-7 Summary of findings from the interviews per Theme

5. Discussion

This chapter discusses the findings from the data collection, based on the identified themes. As the two research questions are somewhat intertwined, the discussion will follow the themes, rather than the specific research questions. The previously presented literature and additional literature found during the study serve as support for the discussion.

5.1 The Ambassadors role and influence

Starting with the definition of the role Ambassador, the findings suggest that the *ambition* of the project management of Ambassadors acting as an agent or intermediary between the project management and the teachers was fulfilled. Most of the Ambassadors did acknowledge this particular role and acted upon it accordingly by participating in department meetings, setting up examples of course areas and inviting colleagues to join them in that course area, answering questions, making suggestions on functionality to use to the trainers, and giving feedback on how to plan and distribute training material to all teachers. There is a question on whether the Ambassadors is a user coalition group or a group of change agents according to the model of Alhogail & Mirza (2011). According to the definition, a user coalitions group contains members of all stakeholders, i.e. IT, management, teachers, and students. This would suggest that the Ambassadors do not belong to the user coalition group. The user coalition group is more of an internal project management group. Alhogail & Mirza (2011) define change agents, as members from the user coalition group with the responsibility to facilitate and manage the change in the university. This definition does only in part fit with the role of the Ambassadors, i.e. the part of facilitating. The Ambassadors had no management role and authority assigned to them.

Assuming that the Ambassadors had a strong social influence on the other teachers, they contributed to the adoption of a technology as described by Keller (2005). Other researchers have discussed the adoption of technology.

Moore (2001) introduces a revised technology adoption life cycle, identifying the deep and dividing chasm between early adopters and early majority of users. This chasm, usually not recognised, constitute an important transition aspect in relation to convincing the late majority of adopters to use an innovation. The early adopters are visionaries, change agents, while the early majority are pragmatists who want to have a productivity improvement, and the late majority are conservatives not approving of discontinuous innovations and believing in tradition over progress (Moore, 2001).

While Moore (2001) focuses on the chasm between early adopters and early majority from a marketing perspective, Hill (2016) applies a teaching perspective to the model and argues:

> *"Ed tech should not be a market to be conquered but rather a continuous process of improving student learning and meeting institutional goals. Faculty members are not just end users to be converted and trained."*

According to Hill (2016), there will always be teachers enthusiastic about new technology and therefore seeking innovations, with opportunities to use in teaching. However, there will also be a larger group of teachers that is or is not interested in using technology when teaching, not having the time or motivation to invest in a search for technologies. The solution is not "crossing the chasm", but "straddling the chasm" instead. To the support of straddling a chasm, the early adopter can sit down with other early adopters and in peer-to-peer discussions find useful tools in a new system. The early majority, mainstream faculty with experience from more than one LMS, can be used to evaluate whether or not a functionality of the LMS is important. Nevertheless, it is important to understand what the faculty members' need, before starting a process of looking for features and solutions (Hill, 2016)

5.2 Implementation

Applying the models of Kotter (1996) and Alhogail & Mirza (2011), the implementation project initiates activities that would influence the change management needed in the project. The role of Ambassadors as change agents according to Alhogail & Mirza (2011) is apparent, but the guiding coalition as defined by Kotter (1996) seems to be missing. No obvious group for this purpose could be identified. On the other hand, activities according to the establishment of short-term wins as described by Kotter (1996) could be identified, the use of the top-ten list can be considered such an activity. However, the main activities for this will have to take place after the project is finished. The final step according to Kotter (1996) is the anchoring of new [teaching] approaches in the culture.

Applying Moore´s revised model, one could look at the Ambassadors as early adopters and the rest of teachers as an early majority, who needed to be convinced of the productivity improvements delivered by the new system. In this context, the late majority will not get any attention, which might suggest that the IT-pedagogical department at HKR have new actions to plan in order to get this group of users to develop their knowledge and use of the LMS. One approach to this Moore (2001), is to use an analogy of the D-Day in order to describe the necessary actions to cross the chasm and reach the goal, to influence the late majority and make them adopt a new technology. The needed actions are "targeting the point of attack", "assemble an invasion force", "define the battle", and "launch the invasion". When targeting the attack, one approach is to look at the compelling reasons to buy, (Why should the teachers adopt). When assembling an invasion force, you look at standards and procedures, training and support among other things (How can we help the teachers?). When defining the battle you develop elevator pitches communicated with in the organisation (How do we communicate the new uses and their success?). When launching the invasion, the analysis of needs (What does teachers need the most?) and the proposal of solutions from a support unit (How do we satisfy teacher's needs?) makes the invasion successful (Moore, 2001).

One method to anchor new approaches as mentioned by Govindasamy (2002), is to develop teams of instructors that could be assigned to develop content in their specific area of expertise, this facilitation being a systematic approach to building learning material in line with learning outcomes. The group of Ambassador could have been such a team, although to do training on their colleagues were not a task assigned to them.

However, training is essential in order to establish (anchor) a culture of using the LMS in an as optimal way as possible while taking pedagogical aspects into consideration. Faculty members must take time, and be given time to attend training. Anderson (2016) suggest the establishment of learning networks for teachers, that share, support and inspire, without a major increase in workload. These networks build on the individual teachers, but must rely on active support, vision and plans from the faculty management. From a support perspective, most of the teachers in this study appreciated the support given by the IT-pedagogical personnel, but lacked the support from faculty management in respect of finding the time necessary for training. The only teachers that got a remuneration in the currency of time, was the Ambassadors. They got 40 hours for participating as Ambassadors, for some this could have been sufficient, but based on the findings of all the activities performed by the Ambassadors, before, during and after their training, it will probably be only a drop in the ocean compared to the actual time spent in the implementation.

Applying the three different perspectives on implementation of an LMS introduced by Keller (2005), it seem that the implementation in this study have the most similarities with the perspective of implementation as a technology acceptance. The UTAUT model seem to fit well with the findings identified as performance expectancy, effort expectancy, social influence and facilitating conditions. The findings gave clear examples on and indications of the expectations on usability, time usage, social influence among colleagues and support. The teachers are able

to enhance their educational task, the LMS is relative easy to use, given the proper training and the LMS could support an improvement in self-efficacy in the user. All of which are implications for a successful use of the LMS. As the implementation was supported by formal (management) and informal (Ambassadors) leaders and build on a reliable technological infrastructure the implications for a successful implementation process is present, thus fulfilling all the requirements of being seen as the implementation as technology acceptance (Keller, 2005).

Seeing the implementation process as an innovation demands that the LMS will be used to fill a performance gap, create positive results consistent with existing beliefs (pedagogical approaches) and be not so complicated to use, in order to influence the use of a new LMS. In addition, the implementation process must be based on a consensus decision, and there must be possibilities to try out the LMS before it is introduced (Keller, 2005). As no performance gap were identified prior to the decision made and the decision was not supported by a consensus among the teachers, the view of the implementation process as diffusion of innovations is not applicable to this implementation project.

As no students were involved in the process, viewing the project as an implementation as a learning process is not possible.

In my opinion, you could view these three approaches, not as three different approaches to choose from, but as stages in a transformation process. From the old pedagogies of distribution content and content mastery only, to the new pedagogies that uses ubiquitous technology in order to facilitate deep learning where exploration and mastering of content in collaboration, then a new interpretation of the result is available.

This transformation process could start with an implementation as acceptance of technology, followed by the implementation as a diffusion of innovations, thus ending in the implementation as a learning process. In such an approach, the first step would help the implementation by making the use of LMS a basic feature in teaching. Step 2 would move the user from basic knowledge (mastering the functionality of at least one quadrant) to advanced, but not to complex, use of the LMS (mastering functionality in two to three of quadrants). Finally, in step 3, the full use of all the quadrants is implemented and the teaching approaches are in full coherence with the chosen approaches of the HEI. This thought needs more research.

Applying this transformation view, might lead to a conclusion that HKR are still at the first step. There are indications that some teachers have moved to step two, especially some of the Ambassadors.

5.3 Major concerns and perceived effects on teachers

Radif, et al., (2015) has identified a number of barriers that influence the implementation of LMS in higher education. The list of barriers contain the following aspects:

“lack of or limited teachers training; “lack of commitment to constructivist pedagogy; lack of experience to use the technology; lack of technical support; and lack of pedagogical training for teachers and the lack of appropriate educational software” (Radif, et al., 2015)

The barriers are categorised as internal barriers (pedagogy, attitudes, and teaching styles) and external barriers (training, time, and administration support). They found that the major barrier was the lack of needed ICT skill followed by lack of needed skills and knowledge. Another factor that have a high influence on the implementation project is lack of time (Radif, et al., 2015).

The study found that the ability to plan and manage their time effectively is important to teachers. Teachers expressed a concern on how they would have sufficient time to getting the proper training; manage the transition of material from the old system to the new LMS, and

enough time to structure a course in the new LMS. They anticipated a lot of extra work. Extra work that would not fit into their already busy schedule.

5.4 Pedagogy and the perceived effects

Renzi (2011) states that when adopting an LMS, teachers do not change their way of teaching. They use the same methods as in a classroom, just finding new ways to deliver content. Blin & Munro (2008) confirms the result. In this study, findings indicate that it also may be the case at HKR. The use of discussion boards alongside comments on administrative relief could indicate that the LMS according to the findings from Renzi (2011) is mostly used to automate teaching. Could it be that it is too easy to transfer poor teaching practices into an LMS (Sharma & Vatta, 2013)? Maybe this behaviour originates from the fact that most LMS lean towards a more course-centred approach instead of a student centred approach (Sharma & Vatta, 2013).

Students' attendance in classrooms is no longer to be taken for granted. This study and Blin & Munro (2008), confirm this. This insight led to a discussion within a faculty on how to improve the pedagogy with the help of other means of delivery.

A few teachers indicated that the introduction of an LMS did in fact help in finding new ways of teaching. One important question on this issue is the question whether or not, the underlying pedagogical approaches that should influence the use an LMS. One aspect is the opinion that the LMS will set the boundaries, which could limit the pedagogical idea. The vendors of an LMS do state support for pedagogical approaches, Blin & Munro (2008), but according to Monaghan et al., (2011) it is up to the teacher to decide on what to do and the best way to do it as educational technology stimulates change. Technology itself has no direct impact on improvements in teaching; it can only influence it positively (Monaghan, et al., 2011). This is also supported, to some extent, by West, et al., (2007) who found that the teacher started off with one small feature, learnt to master it and then moved on to more, basic or elaborate, features in their search for new pedagogical support. A behaviour that in this study can be found among some teachers, especially the appointed Ambassadors.

Another aspect is the time needed for development activities, which according to West, et al., (2007) could be high, and thereby influencing the motivation. Therefore, even if there could be timesaving's at a later stage, the urge to start a development is under negative pressure. This is also compliant with the findings of this study, more than once the time factor was used as an explanation to the "do or not do" decision.

Although a teacher mentioned the pedagogical idea of student-based teaching, few other teachers made comments on their underlying pedagogical approach when teaching. The students were included in the implementation project, thus resulting in a loss of knowledge on LMS from a student perspective. Although, teachers notice their declining participation in classroom activities and discuss the consequences on teaching, there is a need for further understanding. Especially as this new behaviour, non-attendance, has led to new demands, use of LMS to deliver lecture notes etc. This pressure from students to use additional features of an LMS may not be in the line of the teachers' pedagogical approach (West, et al., 2007).

5.5 System Literacy and the perceived effects on the use of LMS

The teachers at HKR are in general experienced users of an LMS, the majority having more than 5 years' experience. Adding the experience of more than one LMS into the equation, it could be an indication of an overall basic LMS literacy within the organization.

The findings suggest that the use of LMS in this case study do not significantly differ from the mainstream use of LMS that other researchers have identified. The use fits very well into the model of Griffin & Rankine (2010) with a use of functionality in all of the four quadrants, communication, management, content and evaluation. The fact that one of the major approaches to teaching is communication shows in the responses from almost every teacher, although the

responses varies depending of type of courses taught. The least used functionality is in the evaluation quadrant. The use of classroom assessments at campus will of course influence the use of LMS functionality for evaluation negatively.

Although teachers might have an overall LMS literacy, the use, or more correctly, non-use of all of the functionality in the LMS correspond with other researchers' findings (Garrote & Pettersson (2011); Govindasamy (2002); Renzi (2011); West et al., (2007)). There is a gap in teachers' use of LMS functionality, as only 24 out of 116 use the full functionality and as many as 40 use only functionality in one of the quadrants. This gap suggests that not all teacher has adopted the use of the LMS in full. One aspect of this might be the lack of confidence in using an LMS and a preference for face-to-face teaching (Renzi, 2011).

Sinclair & Aho (2018) use a model developed by West, et al., (2007) to explain the adoption of LMS by teachers. The model extend the last two steps in the diffusion model used by Rogers (2003). The extended model, develop the last two stages in order to adapt to the practice of LMS, thus illustrating the implementation stage with practical challenges and solutions to these challenges. The last stage, confirmation, take into consideration the alternative ways the user will use the system in the future; continue to used it, use it with limited use of functionality or not using it all (Sinclair & Aho, 2018). The finding from Sinclair & Aho (2018) reveals that experimentation might be needed in the encounter with a new LMS, although some teacher might be inclined to keep the status quo. Teachers that do experiment often experiences technological barriers, when trying to adapt. The study support this result, exemplified by the lust of experimentation expressed in the interviews of Ambassador, particularly in the training sessions conducted by the LRC instructors and in some cases the Ambassadors trial and error approach to their own efforts to learn the new LMS.

The study also show a use of other tools, such as social media and integrated tools from third-party suppliers. In comparison to Faraon, et al. (2011) the use of YouTube as a tool for distributing material, uploading or linking, has increased. Otherwise, the study did not identify other significant differences in the use of social media, nor any differences in the perception on social media as a useful teaching tool. This finding is somewhat surprising, considering the speed in the development of new virtual tools during the last years and the interest for new tools to use in a teaching environment as expressed by the yearly survey of Hart (2018).

6. Conclusion

This chapter present the conclusions drawn from the findings reported in chapter four and the discussion in chapter five. The presentation follows the order of the research questions. Some recommendations for future activities within the area of LMS is suggested and at the end, some suggestions for further research is given.

6.1 Conclusion

6.1.1 Research question 1

RQ 1: What are the main effects, if any, on teachers when a change in or an implementation of an LMS take place? Are potential effects pedagogic, insofar as they alter educational aims, are they limited to enabling new forms of delivery, or are there other concerns that affect the way teachers use the LMS afterwards?

This study had the ambition to identify the potential effects, especially the pedagogical effect, on teachers, when implementing LMS in a higher educational context. The study used observations, interviews and a survey to gather data, processing the data with the help of thematic analysis.

The identified main factor that influenced the teachers was the concern of time management, how to make time for training, running courses, doing research, preparation of new courses in the fall and participation in other information system implementations.

The answers to whether or not there will be any pedagogical effects is Yes, No and Maybe.

Yes, there will be some pedagogical effect coming out of the implementation of Canvas, as some of the Ambassadors expressed their positive experience of using some of the new tools in Canvas. Tools that would give them support in certain pedagogical methods, like using more quizzes, establishing milestones for the students to pass before moving to the next stage and facilitating the use of peer-review. Tool available to use from day one at the start of the semester in august.

No, there will be no particular pedagogical effect for the majority of teachers. Most of those teachers express a concern on how to get material from the old LMS to the new LMS, will have to struggle, for different reasons, in order to get the needed material extracted and with the build of a new course structure in the new LMS. They might have to settle for a minimal version, a "good enough solution", thus just copying former teaching approaches.

The answers Yes and No are given from a short-term perspective. In a long-term perspective, the answer is "Maybe". If, the functionality of this new LMS, is to be used more effectively, supported by a clear vision on pedagogical approaches, and a strategic plan developed and introduced by faculty management, there are potential positive effects to harvest. Moreover, used in combination with other virtual tools, the opportunities will increase.

6.1.2 Research question 2

RQ 2: What influence do the Ambassadors have in an overall project management context? Is it limited to the role of a change agent or user coalition for the project management, or do they have additional impact on the configuration and successful implementation of LMS?

The second ambition in the study was to use change management theory and highlight its impact on the project, in order to understand the reasoning behind and the effects identified by the use of the Ambassador group. The Ambassadors motivation and engagement and its influence on their work as Ambassador, were also of interest.

In the project, access to a trial version (sandbox) of the LMS was delayed due to the contractual issues that cut the implementation phase short. The time and opportunities to do more experiments and training in the system were consequently reduced substantially, thus creating unnecessary concerns on time management issues.

The study found that the Ambassador group most certainly contributed positively to the project. The use of the group as change agents helped the project to spread information and knowledge, thus creating both a curiosity on the new system and in some sense calmed the other teachers on the topic of not being ready to start a new course in the new semester. It also helped the project management to put pressure on the issues of participating in training. In addition, with the participation in the training sessions they gave the project management input on how to configure the new LMS. Whether or not the implementation was successful, is too early to evaluate. It depends among other things on the criteria for success, which can be discussed. It could be the basis for another study.

The Ambassadors can be considered as highly motivated, early adopters, although they all had various interest for participating. This suggest that this group is very suitable for doing more change agents work in the future, come new initiatives towards effectively using the LMS from a more distinct pedagogical approach at the university.

6.1.3 Recommendations

One immediate suggestion is to start a group of dedicated teachers with the ambition to act as a generator of ideas on how to use the LMS and/or other tools for specific teaching approaches, based on the emerging new pedagogies. Among the Ambassadors, teachers with drive, interest and knowledge of teaching with the support of an LMS were common, so maybe some of those could initiate this group.

6.2 Contribution

This research has contributed to an understanding of how a project management can use the help of a group of Ambassador to solve change management issues and highlighted how teacher involvement could affect an implementation of an LMS.

It confirms other research concerning the fact that new technology does not necessarily relate to new teaching methods and makes suggestions as to why this might be. The main concern, time management can be split as follows:

1. Lack of time for training.
2. Lack of time for necessary preparations in the new LMS.
3. Lack of time to pursue new pedagogical methods.
4. Lack of time to evaluate the use of other available tools.

It has also contributed to an understanding of how prior experience influence teachers when participating in a change of LMS.

In addition, it has shed some light on whether or not teachers use tools outside the LMS in their education and more specifically the development or not, towards a use of social media in teaching.

It has also provided an understanding on whether or not the different pedagogical standpoint the individual teacher have influenced the implementation of an LMS. It is too early to make strong conclusions about how and whether or not, teachers will appropiate the technology over time. This does imply, however, that the change management process in this case should not have an end point.

First, one weakness of this research is that it only focus on teachers and members from project management team. Other users of an LMS, such as students and administrative personnel are not included. In a perfect research setting, they would have been included, but given the time, it was not doable. This exclusion might influence the overall completeness and understanding of how an LMS affects it´s users and why the teachers use an LMS in a certain way.

Secondly, one weakness of this report is the period for the study. Although the project has been going on for some years, the actual study took place when the project were in its final phase. The study would have benefitted from being more synchronised with the project. If so, the initial quantitative survey could have served as a better support for the qualitative methods of interviews and observation, which could have led to a clearer understanding of the topic.

Finally, another weakness is the limited knowledge on how the implementation project from a management perspective has developed from the start, when establishing the initial demand for a new LMS, to the actual situation when the kick-off of the actual project initiated the implementation of a new LMS. This knowledge could have given other aspects and perspectives to the research.

6.3 Future Research

Weller (2007) discusses the use of LMS in the context of on-line learning, i.e. not considering the pure campus courses. One possible extension to this study is to explore whether the teachers recognise the pedagogical approaches introduced by Weller (2007) and if so, how do they apply them in the context of an LMS and campus education.

Although research has been done from a student perspective, it could be interesting to get a view on how students experienced the change, this comparing the experiences of an LMS between students that meet the LMS for the first time when starting their education and those that have been using two different systems. The only restriction to this research is the time factor, i.e. with the passing of time; the second group of students will finished their education.

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Appendices

Appendix A: Permissions granted

Hi Torsten

You can use the infographic on the Top 100 Tools for Education provided there is full attribution and a link to the source

Best wishes

Jane Hart

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Appendix B: Survey questions with translation to English.

Swedish	English
1. Vilken fakultet tillhör du?	1. To which faculty do you belong?
2. Hur stor del av din undervisning bedriver du i Campuskurser	2. How much of your teaching do you do in Campus courses
3. Hur stor del av din undervisning sker i Nätbaserade kurser, d.v.s. kurser som bedrivs on-line med få träffar på campus.	3. How much of your teaching takes place in Network-based courses, i.e. courses conducted on-line with few hits on campus.
4. Hur stor del av din undervisning sker i Distanskurser, d.v.s. i rena online-kurser utan fysiska träffar med studenterna?	4. How much of your teaching takes place in Distance courses, i.e. in pure online courses without a physical meeting with the student?
5. Hur lång erfarenhet av lärplattformar har du?	5. How much experience with learning platforms do you have?
6. Vilka lärplattformar har du erfarenhet av	6. From what learning platforms do you have experience?
7. Vilket ändamål är det viktigaste för dig att du får stöd från en lärplattform för i din undervisning? Administration, Kommunikation, Distribution, Examination?	7. What purpose is the most important thing for you to get support from a learning platform for in your teaching? Administration, Communications, Distribution, Examination?
8. Varför är detta viktigt?	8. Why is this important?
9. Skiljer sig din användning av lärplattform åt, beroende på vilken typ av undervisning du bedriver? T.ex. använder du dig av lärplattformen för andra ändamål vid genomförandet av en campuskurs än om du bedriver en distanskurs?	9. Does your use of learning platform differ depending on the type of teaching you are doing? E.g., do you use the learning platform for other purposes in a campus course than if you are doing a distance course?
10. Vilket/Vilka system(program), förutom lärplattformen It´sLearning, använder du (eller har du använt) dig av i din undervisning för att administrera din kurs och dina studenter?:	10. Which system (s), in addition to the learning platform It´sLearning, do you use (or have you used) in your teaching to administer your course and your students?
11. Vilket/Vilka system(program), förutom lärplattformen It´sLearning, använder du (eller har du använt) dig av i din undervisning för att kommunicera och samarbeta i din kurs	11. Which / what system (programs), in addition to the learning platform It´sLearning, you use (or have you used) in your teaching to communicate and collaborate in your course
12. Vilket/Vilka system(program), förutom lärplattformen It´sLearning, använder du (eller har du använt) dig av i din undervisning för att distribuera material till kursen	12. Which / what system (program), in addition to the learning platform It´sLearning, do you use (or have you used) in your teaching to distribute material to the course
13. Vilket/Vilka system(program), förutom lärplattformen It´sLearning, använder du (eller har du använt) dig av i din undervisning för att examinera i din kurs?:	13. Which system (s), in addition to the learning platform It´sLearning, do you use (or have you used) in your teaching to examine your course?
14. Vilket/Vilka sociala medier använder du (eller har du använt) dig av i din undervisning ?:	14. Which social media do you use (or have you used) in your teaching?
15. Var du anställd på HKR under 2014 då HKR gick över till att endast använda sig av It´sLearning som lärplattform?	15. Were you employed at HKR in 2014 when HKR went to using only It´sLearning as a learning platform?
16. Har du varit med om ett införande/byte av lärplattform utanför HKR?	16. Have you participated in an implementation or change of learning platform outside HKR?
17. Hur upplevde du övergången/införandet av en ny lärplattform?	17. How did you experience the transition or implementation of a new learning platform?
18. Vad var den huvudsakliga anledningen till ditt svar ovan?	18. What was the main reason for your answer above?

19. Övergången/införandet av en ny lärplattform påverkade mitt sätt att planera och bedriva undervisning 20. Vilken var den huvudsakliga påverkan på din undervisning vid övergången/bytet av lärplattform? 21. Vad är det viktigaste för dig och din undervisning som det måste tas hänsyn till vid övergången till den nya lärplattformen Canvas? 22. Vad är din största farhåga/oro/rädsla inför övergången till den nya lärplattformen Canvas?	19. The transition or implementation of a new learning platform affected my way of planning and teaching. 20. What was the main impact on your teaching that the transition or implementation platform had? 21. What is the most important thing for you and your teaching, which must be taken into account in the transition to the new Canvas learning platform? 22. What is your biggest concern or fear regarding the transition to the new LMS Canvas?

Appendix C: Informed Consent Form (in Swedish and English).

Information om studie kring Learning Management Systems (LMS).

Jag heter Torsten Andersson och jag studerar Informatik på avancerad nivå (MSc (2 year) in Informatics) vid Linnéuniversitet i Växjö. I min utbildning ingår att genomföra en studie som kommer att presenteras i en skriftlig rapport vid universitetet.

Studiens syfte är att belysa olika aspekter kring införande/byte av ett LMS vid en svensk högskola, nämligen Högskolan Kristianstad.

I studien kommer att antal intervjuer, i grupp eller enskilt att göras. Intervjuerna beräknas ta 1,0 - 2,0 timmar beroende på antalet personer vid det enskilda intervjutillfället. Hela intervjuerna kommer att spelas in på band.

I studien kommer också information från kursytan i Canvas som användes för den utbildning av Ambassadörer som genomfördes att samlas in, t.ex. genom att olika forum där diskussioner och frågor kring kursen, inställningar och funktionalitet läses och för studien relevant information identifieras.

Intervjuerna och insamlat material från kursytan i Canvas kommer att behandlas konfidentiellt, vilket innebär att materialet kommer att avidentifieras och behandlas i enlighet med bestämmelserna i Sekretesslagen.

Din medverkan är frivillig och du kan när som helst avbrytas utan närmare förklaring.

Torsten Andersson/torsten.andersson@hkr.se

Skriftlig informerat samtycke till medverkan i studie

Jag har informerats om studiens syfte, om hur informationen samlas in, bearbetas och handhas. Jag har också informerats om att mitt deltagande är frivilligt och att jag, när jag vill, kan avbryta min medverkan i studien utan att ange orsak.

Jag samtycker härmed till att medverka i denna studie som handlar om införande/byte av Learning Management system.

Ort/datum

Namnunderskrift:

Namnförtydligande:

Underskrift av forskare (Torsten Andersson):

Information about a study on Learning Management Systems (LMS).

My name is Torsten Andersson and I study Informatics at advanced level (MSc (2 year) in Informatics) at Linnaeus University in Växjö. My education includes conducting a study that will be presented in a written report at the university. The aim of the study is to highlight various aspects of the introduction / exchange of an LMS at a Swedish university, namely Kristianstad University.

In the study, the number of interviews, in groups or individually, will be conducted. The interviews are estimated to take 1.0 - 2.0 hours depending on the number of people at the individual interview. The entire interview will be recorded on tape.

The study also includes information from the course area in Canvas that was used for the training of Ambassadors implemented to collected, eg through different forums where discussions and questions about the course, settings and functionality are read and relevant information is identified for the study.

Your participation is voluntary and you can withdraw at any time without further explanation.

Torsten Andersson/torsten.andersson@hkr.se

Written consent to participate in the study

I have been informed about the purpose of the study, how the information is collected, processed and managed. I have also been informed that my participation is voluntary and that, when I want, I can withdraw my participation in the study without stating cause.

I hereby agree to participate in this study which deals with the introduction / replacement of a Learning Management system.

Place and Date

Signature:

Name clarification:

Signatur of the researcher (Torsten Andersson):
