Integrating a Learning Management System in two Norwegian higher education institutions

A case study of an innovation process in higher education

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Abstract

This study analyses how the introduction of the learning management system Blackboard leads to persistent innovation in teaching activities at the higher education institutions Norwegian School of Management-BI and the College of Buskerud.

Innovation theory is used as a theoretical framework for the thesis, where: the outcome of the innovation process is either termination or institutionalisation of the innovation. A model centred on the users' perception of the innovation's profitability and compatibility has been selected for this case (Levine 1980). Based on the assumption that high degree of profitability and compatibility lead to persistent innovation, a selection of teachers and administrators at the two institutions have been interviewed on predefined parameters, modelling how profitable and compatible they were perceiving Blackboard. The data from the interviews were complemented by document analysis.

The results show a gap between the perception of profitability and compatibility by the teachers, and by the administrators. In general, the administrators perceive Blackboard as highly profitable and compatible, whereas the teachers' perception of Blackboard is not very positive. Results tend to indicate that the use of Blackboard does not lead to persistent innovation at the two higher education institutions. However, there are indications at both institutions that the use of Blackboard is increasing, and not decreasing. It may indicate that other factors affect the adoption and institutionalisation of Blackboard, such as the perception of an external and internal normative pressure.

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1. Introduction

> *I can say with great confidence that the Internet is going to change education as fundamentally as it changed when we had printed books.*
>
> Bill Gates, October 1999

Bill Gates' prediction from 1999 could in 2003 be seen as overly optimistic. Meanwhile, the so-called "dot-com boom" ended in 2000, and the rhetoric has changed from Bill Gates' prediction of a *revolution* in education, towards reports of an *evolution* in education, including higher education. However, because of the inevitable expansion of the opportunities of technology, there is continuous interest in the possibilities opened by the use of technology in educational delivery. These possibilities encourage many universities and higher education institutions to increase the use of Information and Communication Technology (ICT) in education. A visible effect of this development is the expanded use of Learning Management Systems (LMS) in higher education institutions. During the last years, many institutions have implemented an LMS as a pedagogical and administrative tool. This development is still at an early stage. The role an LMS, or any other form of electronic network technology, should play in an institution's educational delivery in the future is unclear. Some hope that ICT tools like LMS will promote innovative education using new pedagogical methods (Collis & Moonen, 2001). Meanwhile traditional higher education institutions resist change and hence are slow adapters of network technology (Bates, 1997).

This thesis will use a case study approach to see how the implementation of an LMS can promote innovation in higher education. By analysing the implementation of a Learning Management System called Blackboard at two Norwegian higher education institutions, a better understanding of the institutional processes associated withsuch an implementation will be sought. The thesis will also analyse how the implementation of Blackboard has affected the educational delivery.

1.1 The role of ICT in higher education

The pedagogical and administrative advantages are used as arguments for an increased use of ICT in higher education. Many of the tasks universities perform are inherently collaborative; the teaching and learning processes involve at least two parties; the lecturer and the student. Research also normally involves several people often situated at different institutions internationally. ICT supports a new concept of teaching and learning with new ways of delivering higher education that overcome the inadequacies of our current one-size-fits-all and face-to-face approach to teaching (Jaffee, 1998). The use of Internet and collaboration platforms will represent increased efficiency and effectiveness in the main activities at the university (Hazami et al, 1998). ICT is an exceptional instrument; being pedagogically effective, cost effective, and socially beneficent (Curran, 2001). These advantages are used as arguments on an international, national and institutional level supporting the increased use of ICT in higher education. One influential international agreement concerning the future of higher education is the "World declaration of higher education for the 21st century: vision and action - Framework for priority action for change and development of higher education" a result of UNESCO's world conference on higher education in 1998. In Article 12, concerning the potential of and the challenge from technology, it is argued that: "*the new technologies offer opportunities to innovate on course content and teaching methods and to widen access to higher learning*" (UNESCO, conference in Paris 1998). At a national level, the Norwegian parliament adopted the white paper: *St.meld.nr. 27 (2000-2001) Gjør din plikt - krev din rett - Kvalitetsreform for høyereutdanning - (Do your duty - Demand your rights*- Quality Reform of Norwegian higher education). The reform, implemented in 2003, introduces a new degree structure (masters and bachelors), new teaching methods involving a higher level of student activity and recommends new assessment modes and regular feedback. The use of ICT is considered to be one condition for a higher education institution's capability to offer a relevant, updated and flexible education, in accordance with the reform (St.meld. nr. 27 chap 2, 2.7). These international and national plans, including the use of ICT, reflect the institutional level. Institutional strategy plans emphasise the use of ICT to support teaching and learning as a major success criterion for a higher education institution. As an example, the overall strategy goal for the Norwegian business school BI in the period 2000-2002 was to become a leading actor in the use of ICT (BI – strategy plan 2002-2002).

At several higher education institutions, the implementation of an LMS is the realisation of a strategic focus on ICT in teaching and learning. However, some argue that despite the advantages of the new technology, higher education institutions resist change (Curran, 2001). They are bottom-heavy organisations difficult to change by top-down demands (Clark, 1984). According to Castells (1996):

> *The development of electronic communication and information systems allows for an increasing disassociation between spatial proximity and the performance of everyday life's functions. However, schools and universities are paradoxically the institutions least affected by the virtual logic embedded in information technology, in spite of the foreseeable quasi-universal use of computers in the classrooms of advanced countries. But they will hardly vanish into the virtual space. In the case of universities, this is because the quality of education is still and will be for a long time, associated with the intensity of face-to-face interaction. Thus the large-scale experiences of distance universities, regardless of their quality, seem to show that they are second-option forms of education which could play a significant role in a future, enhanced system of adult education, but which could hardly replace current higher education institutions (Castells 1996:397)*

A recent international comparative study supports this claim.

> *Overall it seems that higher education institutions do not expect any revolutionary change as a result from or related to the use of ICT. There is not really a concern about being forced to change by external factors or developments. Rather, a 'business as usual' approach is taken … Nevertheless, institutions are gradually 'stretching the mould'; they change their procedures and models as a process of change from within. (Collis & van der Wende 2002)*

The contrast between the ambitious overall institutional strategies connected to the use of ICT in higher education and the apparently slow implementation by the teachers within the institutions, exposes the different views on ICT.It illustrates the complexity of the implementation process.

1.2 Purpose of the study

The primary purpose of this study is to get a clearer understanding of the processes taking place within higher education institutions when implementing an LMS. To get a better understanding, factors that may affect the implementation process will be identified and analysed. The introduction of an LMS into a higher education institution does not necessarily lead to a general use of the LMS. The aim of this study is to try to predict the outcome of an implementation process. Will the LMS be institutionalised at a higher education institution or is it more likely that the users will reject the LMS at the end?

The implementation of an LMS is normally motivated by an aspiration to change educational delivery. The implementation of the LMS may be seen as an innovation process as such (Levine, 1980). In an eponymous book, Levine's ambition was to build a model for explaining "why innovations fail".He argues that the innovation process goes through four stages. He also identifies two key dimensions which drive the innovation process among the concerned parties; the perception of profitability, and the perception of compatibility. Levine's view on the innovation process and his definition of the concepts of profitability and compatibility will be described in chapter 2. For the purpose of this study, Levine's definition of an innovation process and his model to evaluate the outcome of innovation processes will be used.

A higher education institution consists, like all organisations, of different interest groups influencing an innovation process in different ways. Two key groups are the teachers and the administrators. For that reason another purpose of this study will be to identify the roles of these two groups in the innovation process. Who initiates the process? Can it be seen as a top-down or a bottom-up innovation process? Is the motivation different in the two groups for the implementation of an LMS? Which group will be the most influential on the outcome of the innovation process? These questions will be central in the analysis of the innovation process at the two higher education institutions.

1.3 Research questions

Based on the above considerations, one overall research question has been formulated.

- How does the introduction of the learning management system Blackboard in two Norwegian higher education institutions lead to persistent innovation in an institution's delivery of its teaching activities?

Levine sees profitability and compatibility as important factors in an innovation process. They will be used in this study to estimate the outcome of the innovation process. The difference between teachers' views and administrators' views may have an impact on the institutionalisation of Blackboard. Hence, two sub research questions have been identified:

- How do the teachers' perception of profitability and compatibility affect the institutionalisation of Blackboard?
- How do the administrators' perception of profitability and compatibility affect the institutionalisation of Blackboard?

1.4 Methodology

1.4.1 Case study

The overall research question seeks to address how the introduction of the Learning Management System Blackboard leads to persistent innovation. According to Yin (1994), one should choose a case study approach. Yin argues that a case study has a distinct advantage when *"a "how" and "why" question is being asked about a contemporary set of events over which the investigator has little or no control"* (1994:9). The need for a case study arises out of the desire to understand complex social phenomena. It allows an investigation to retain the holistic and meaningful characteristics of real-life events (ibid). The introduction and use of the Learning Management System Blackboard in higher education fits the description of a contemporary event where the investigator has little control. It is a process which is planned and initiated by actors within the higher education institution, the investigator is only

observing and analysing the process from an external position. The process that eventually can lead to persistent innovation in an institution's delivery of teaching actitivies is a complex social phenomenon. It reflects a dynamic relationship between the LMS tool and the perception of this tool by a variety of different actors at the higher education institution.

According to Yin (1994), there are 5 components that are particularly important for a case study's research design:

1. A study's questions,
2. its propositions, if any,
3. its unit(s) of analysis,
4. the logic linking the data to the propositions, and
5. criteria for interpreting the findings. (Yin 1994:20)

All 5 components will be taken into consideration in this study.

The study's questions are presented above.

The propositions are formulated in chapter 4 as assumptions about how the teachers and the administrators perceive Blackboard as profitable and compatible. Based on Levine's model, these assumptions represent the theoretical framework of the study.

The units of analysis or the cases in this study are the two higher education institutions, BI and the college of Buskerud. The two institutions were chosen because they implement the same LMS. Both also showed, through their strategy plans, a similar view on ICT as an important premise for quality and expansion of the institution's delivery of educational programmes. The fact that they represent a private and a public institution is a deliberate choice that makes it possbile to analyse how the perception of profitability and compatibility affects the innovation process within two different institutional settings.

Within the two institutions, there are several departments. The focus in this study is limited to two departments at each institution. For the college of Buskerud, the departments in Hønefoss and Kongsberg were chosen. For BI, BI Sandvika graduate school and BI Oslo were

chosen. Within these departments, teachers and administrators were chosen as representatives for the institutional view.

To limit the scope of study, the students' perspective is left out. However, it is probable that the students' attitude affects the teachers' perception of Blackboard, and thus its institutionalisation.

A deductive approach will be used to link the data to the theoretical framework. The data collection is designed after the assumptions were formulated (Judd et al., 1991). The interview questions are directly based on the theoretical framework and seek to clarify how the interviewees perceive Blackboard in terms of profitability and compatibility.

According to Yin (1994), there are no precise ways of setting the criteria for interpreting findings in case studies. In this study, interpretation of the findings is again based on the theoretical framework. In accordance with one suggested approach referred in Yin (1994), the evidence was placed within a matrix of categories. These categories follow the assumptions about profitability and compatibility in the theoretical framework. The direct aim is to integrate the findings in a model designed to evaluate the degree to which the innovation has been institutionalised.

1.4.2 Data Collection

Data was collected during two periods of interviews and supported by document analysis.

McCracken (1988) claims that the interview as research method is one of the strongest methodical tools within a qualitative research project. The aim of an interview is to obtain descriptions of how the interviewee perceives and interprets the phenomenon that is being studied (Kvale, 1997). Kvale argues that the semi-structured interview is the best method to gain knowledge of the interviewee's perceptions and interpretations of a given phenomenon. He claims that the interview should be a professional conversation where the interviewer should define the subject and follow up the interviewee's responses with critical questions. To capture the variety in the interviewee's perception, a semi-structured interview form has therefore been chosen in this study. The questions are based on an interview guide

(appendices A and B), but the interviewer formulated additional and relevant questions to elaborate the interviewee's perspectives. This method was used in both of the two data collections periods.

Documents should, according to Yin (1994), be used with caution. *"They should not be accepted as literal recordings of events that have taken place"*(page 81). One of the weaknesses referred to by Yin (1994) is biased selectivity – if the collection is incomplete or access is deliberately blocked. In a case study, the use of documents should thus mainly be to support and enhance evidence from other sources (ibid.).

1.4.3 The data collection for the two case studies

The two data collection periods were conducted with an interval of about one year, the first in May/June 2002 and the second in April 2003.

The first interviews were carried out as part of a larger international comparative study, concerning the current and future use of ICT in higher education. The Centre for Higher Education Policy Studies (CHEPS) and the Faculty of Educational Science and Technology of the University of Twente launched this study in 2001. Norsk Institutt for studier av Forskning og Utdanning (NIFU) was responsible for the Norwegian contribution and the author of this thesis conducted two of the Norwegian case studies May/June 2002. The researcher responsible for the Norwegian study formulated the interview guide that was used in the interviews. The results from the Norwegian part of the study were published in the report: "*Bruk av IKT i høyere utdanning. Institusjonelle valg og organisatoriske konsekvenser" (The use of ICT in higher education. Institutional choices and organisational consequences) Report 8/2002.*

The NIFU-study provides useful data for this thesis only to a certain degree. It gives a good description of the institutional focus on ICT and the decision-making process prior to the implementation of Blackboard. It was thus useful for the case description and the administrators' perception of profitability and compatibility of ICT in general and Blackboard in particular. It however became evident, when formulating the theoretical framework of this thesis, that additional interviews focusing on the teachers were necessary. The teachers'

interview guide is formulated directly connected to the theoretical framework of this thesis. This last data collection has been the source for the analysis of the teachers' perception of profitability and compatibility of Blackboard.

Information from different kinds of documents is used for the analysis. The documents areofficial policy documents, such as the strategy plan for the current strategy period. It also includes non-official internal reports used by the administrations' to formulate the official policy documents. These documents are meant to be secondary data for the administrations perception of profitability and compatibility of the use of ICT and Blackboard. However, in the case of the college of Buskerud, few administrators were willing to be interviewed. Here the documents hence are a key source of information regarding the administration at the college of Buskerud. In accordance with Yin's (1994) warnings about limitations when using documents as information source, this part of the study may come out weakened. To mitigate the risk of biased selectivity, the researcher uses many sources to collect documents at the institution, and has cross-checked that no referenced document is missing. The researcher also has access to non-published documents and was told that no other document was withhold.

1.4.4 Sampling strategies

During the first data collection, the sampling criterion was to select 12 interviewees distributed proportionally among the administration, the teachers, and the technical support staff from each institution. In the second data collection, the sample was limited to 5 interviewees from each institution, all teachers. In both data collections, the sample from the college of Buskerud represented the two chosen departments. In the first data collection period there were 6 interviewees from each department. In the second period, there were 2 from Hønefoss and 3 from Kongsberg. At BI there were also 6 interviewees from each department in the first data collection period. In the second period, 2 were selected from BI Oslo and 3 from BI Sandvika graduate school.

The only selection criterion for the teachers was to find interviewees who were familiar with Blackboard and had started using it at least on a minimum basis. This was to assure that the interviewees had enough basic knowledge about Blackboard to be able to reflect upon the

profitability and the compatibility of the tool. These interviewees were probably not representative for the whole teacher group and generalisationabout the whole institution is thus not possible.

In both data collection phases, a non-probability sampling approach was selected; interviewees were not chosen at random (Judd et al., 1991). More precisely a snowball sampling method was used to select the interviewees within each case. Snowball sampling begins with identifying someone who meets the criteria for inclusion in the study. Then you ask that person to recommend others whom he/she knows also meet the criteria (Trochim, 2003). The researcher realises that this sampling method reduces even more the representativity of the sampled group. One risk is to select only teachers known to be advanced users. The other risk is to assemble teachers who share the same view on Blackboard. All the same, Snowball sampling was selected because the researcher was unfamiliar with the two institutions, and the teacher groups were large and complex.
To mitigate these risks, the samples from both institutions include two interviewees with only a minimum knowledge of Blackboard.

1.5 Limitations and delimitations

Most of the limitations and delimitations are identified throughout the text. They will only be mentioned shortly in this section.

The limitations related to methodology:

1) Students are left out to limit the scope of the study (discussed page 7). As indicated on page 9, the technical support staff was included in the NIFU study. However, to limit the scope of this study, this group has been left out of this thesis's study.

2) The sample and the sampling method make a generalisation difficult. The sample is probably not representative for the whole teacher group at the two institutions because: a) the sample is small; b) they have all implemented Blackboard; c) a snowball sampling approach has been used (discussed page 9-10).

3) Document analysis was used as the key source of information for the administration at the college of Buskerud because few administrators were willing to be interviewed (discussed page 9).

Another delimitation is the focus on pedagogical use of Blackboard. This study is not concerned about how learning is affected by the pedagogical use of Blackboard. The focus is merely on the institutionalisation of Blackboard as a pedagogical tool.

1.6 Structure of the thesis

This thesis contains two main parts: a theoretical section, presenting theory perspectives on innovation processes and use of technology in higher education, and an empirical section, presenting and discussing the findings from the two higher education institutions studied.

Chapter 2 presents conceptual views on innovation processes. The first part of the chapter introduces a general perspective on innovation processes, related to the different stages in this process and the factors affecting the outcomes of the innovation process. The second part presents views on innovation processes more specifically related to higher education institutions.

Chapter 3 describes different views on the role of ICT and LMS in education and more specifically in higher education. The first part describes characteristics and attributes of LMS. The second part presents different views on how an LMS generates innovation in teaching activities. The attributes that are believed to have an impact on education are discussed in relation to other views from literature and studies already conducted in the field of ICT and education.

Chapter 4 constitutes the theoretical framework for this study. The characteristics of and attributes in the LMS that are believed to generate innovation in the teaching activities, as presented in chapter 3, are formulated as assumptions about the impact of the LMS on teaching activities. The theoretical perspectives of the innovation process presented in

chapter 2 are used to organise the assumptions into two categories; assumptions about profitability and assumptions about compatibility. The relevance of these assumptions will be tested in the case study.

Chapter 5 describes the LMS Blackboard, implemented at two higher education institutions, BI and the college of Buskerud.

Chapter 6 presents the findings of the study. The findings from the two institutions are presented separately, first in relation to profitability, then in relation to compatibility.

Chapter 7 analyses and discusses the findings in relation to the theoretical and conceptual perspectives presented in chapter 2, 3 and 4.

Chapter 8 is a summary of the study and its findings, and draw general conclusion about the innovation process at the two higher education institutions.

2. Innovation processes in higher education institutions

2.1 Innovation in organisations

As the main focus of this study is to analyse how the introduction of Blackboard leads to persistent innovation in two specific higher education institutions, it is important to see how the concept of innovation is defined in the literature. This chapter will first focus on the innovation process in organisations in general, then specifically in a higher education context.

2.1.1 Defining the concept of Innovation

Rogers (1995) defines innovation in social settings as an idea, practice or object that is perceived as new by an individual or any other unit of adoption. According to Rogers, it matters little whether the idea is objectively new: - the perceived newness of the idea by the individual matters, and determines his or her reaction to it. If the idea seems new to the individual, it is an innovation (1995:11). Another characterisation is the one by Levine (1980); an innovation can be operationally defined as any departure from the traditional practices of an organisation.

An innovation can lead to a social change in ideas and practice if it is successfully implemented in a social system, itself defined as a set of interrelated units that are engaged in joint problem-solving to accomplish common goals (Rogers 1995). When new ideas are introduced, diffused and adopted or rejected within a social setting, social change occurs.

2.1.2 The innovation process

Arthur Levine's innovation theory, presented in his book "Why Innovation Fails" (1980) constitutes a conceptual framework for this thesis. Levine's perception of the different stages in the innovation process and his emphasis on the adopters' perception of profitability and compatibility will be the foundation of the analysis in this thesis. The self-explaining title of the book reflects Levine's perception of the innovation process in higher education. He claims that most of the innovative undergraduate programs, which he studied in the 1960s, failed. He argues that this is because they were never institutionalised and therefore declined after some time. The term institutionalisation is defined below.

Levine sees the innovation process as having four fundamental stages:

> *1) Recognising the need for change – it is realized that some organizational need is not being satisfied.*
>
> *2) Planning and formulating a means of satisfying the need – a concrete plan is developed.*
>
> *3) Initiation and implementation of the plan – the plan is put into operation on a trial basis.*
>
> *4) Institutionalisation or termination of the now operating plan – either the operating plan is routinized and integrated or it is ended (Levine 1980:7)*

According to Levine, most studies of innovation concentrate on the first three stages, where the third stage is seen as the conclusion of the process. Levine however argues that the last stage, institutionalisation or termination, is the most critical phase. Institutionalisation of an innovation means that the innovation has been successfully implemented and diffused in the organisation. It will, as a result, have sustainable impact on the organisational practice. If however the innovation is not institutionalised, it will have no longitudinal impact on the organisation and will be rejected after a certain time. He defines termination of the innovation as the case when the organisation fails to take certain critical factors into account in the implementation process of the innovation (ibid). These critical factors will be elaborated throughout in this thesis.

Stage One: Recognising a Need for Change

The first stage of the innovation process starts when the organisation recognises a need for change. This perception of need for change can be triggered when the organisation fails to achieve desired goals, or when it is thought that goals can be satisfied better in another manner. Levine argues that changes occur in the organisation's norms, values and goals.

Levine defines the organisational norms as the commonly prescribed guide to conduct in the organisation. These are identified as, for example, means of communication, patterns of authority and control or rules of membership. He further defines the values of an organisation as the commonly shared beliefs and sentiments held by people in the organisation. And the goals are, according to him, the commonly accepted purpose and direction of the organisation. When those within the organisation perceive a change in the norms, values and goals they recognise the need for change; the innovation process can begin (ibid).

The norms, values and goals are unique for every organisation. Levine compares the uniqueness of every organisation with an individual's personality. Like an individual, the organisations guard themselves against forces that threaten the balance and security within the organisation. An innovation can imply important changes in the organisation's norms, values and goals and is often met by a sort of 'defence mechanism'. Levine calls these defence mechanisms boundaries. A boundary is described as a "symbolic set of parentheses" which gives constancy and stability within the larger environment (Levine 1980:12).
Levine defines the innovation trigger in terms of boundaries: the process is triggered when environmental change makes existing boundaries unworkable. He claims that any change in the organisation's norms, values and goals requires a comparable change in its boundaries.

Stage two: Planning and formulating the means of satisfying the need

Rogers (1995) describes this stage as the persuasion stage. In this stage the individuals, often the decision-making unit, get more psychologically involved inthe innovation. They seek information about the new idea and form a general perception of the innovation (ibid). In this process they develop either a favourable or an unfavourable attitude towards the innovation. This can determine the perception of the profitability of the innovation throughout the organisation (Rogers 1995, Levine 1980).

It is important to take the organisational setting into account when planning the implementation of a new invention. Fullan (1991) claims that the planning of any innovation must be appropriate to the educational setting for which it is planned. He argues that the best beginnings combine the three R's of relevance, readiness and resources. Relevance implies an interaction of need, clarity of the innovation and utility. In other words, adopters should recognise the need for the innovation, they must understand the innovation and they should perceive that an adoption is worth the effort. Readiness means the organisation's capacity to initiate, develop and adopt a given innovation. Resources relate to the accumulation of and provision of support as a part of the change process (ibid).

Stage three: Initiation and implementation of the plan

This stage is, according to Levine, a trial period where the innovation is tested as a solution for the unsatisfied need. Rogers (1995) sees the implementation stage as a period when the individual or the organisation puts the innovation into practice. The implementation of an innovation is challenging because at this point, the relevance of innovation is tested in the organisation.

Where this stage ends and the fourth stage starts is not clear-cut. But after a trial period, which can take several years (Fullan 1991), the organisation will either reject or adopt the innovation on a more permanent basis.

Stage four: Institutionalisation or terminating the now operating plan

The last stage in the innovation process is initiated when "*the organisation starts to send a gradually increasing number of cues to the innovation – initially subtle, subsequently unsubtle – about how it should begin to fit in with the organization"* (Levine 1980:13). At this stage, organisational or individual boundaries are critical. The organisational norms, values and goals converge with the innovation. An expansion of the boundaries would imply an adoption of the innovation (ibid). According to Levine, there is very seldom a complete acceptance of the innovation differences. Mutual changes in both organisation and innovation are often agreed upon through joint negotiation, which results in a hybridisation of the two. The degree of boundary expansion and the negotiation between the organisation and the innovation, result

in degrees of acceptances, or absorption of the innovation. Acceptance or absorption of the innovation can have two outcomes; 1) if it is accepted in parts of the organisation, the innovation assumes an isolated position within the organisation, described as enclaving; 2) it may also spread throughout the organisation, an occurance described as diffusion (ibid). However, if the boundaries contract, the innovation will be kept outside organisational boundaries. According to Levine, an organisation rejecting an innovation will have to formalise and reinforce the organisation's legitimate boundaries and end internal conflicts. There are two possible sanctions; 1) resocialisation occurring when the innovative unit is forced to adjust to acceptable norms, values and goals that it failed to incorporate previously; or 2) termination of the innovation (ibid).

According to Levine, there are two important dimensions that will have a great impact on the innovation process within an organisation: profitability and compatibility.

Profitability is defined as the degree to which an innovation satisfies the organisational, group and personal needs of the host organisation. Compatibility is defined as the degree to which the norms, values and goals associated with the innovation are congruent with those of the host organisation. According to Levine, profitability and compatibility make up the twin wheels that run the institutionalisation-termination model. In previous studies, Levine observed that diffused innovations were found to be profitable for the host and compatible with its personality, while the terminated innovation was unprofitable and incompatible.

Based on Levine's theory, a model has been developed that illustrates the different solutions to the adoption of an innovation within the organisation and the role of profitability and compatibility in this last institutionalisation-termination stage.

Compatibility

Low high

Profitability		
high	(iv) Resocialisation	(i) Diffusion
low	(iii) Termination	(ii) Enclaving

Figure 2.1 (van der Wende et al., 1999)

Other researchers looking at innovation in organisations support this theory. In accordance with the idea of compatibility as a favourable condition for diffusion, some claim that the innovation should emerge from a contextual need within the organisation (Bhushan et al., 1997). Rogers (1995) sees compatibility as the degree to which innovation is consistent with existing values, past experience and potential adopters' needs. An innovation that is incompatible with the values and norms of a social system will not be adopted as rapidly as an innovation that is compatible. The social system, as defined by Rogers (see above), constitutes a boundary for the diffusion of the innovation. According to Rogers, the degree to which an innovation is seen as advantageous for the individuals within the social system, or for the social system as a whole, impacts on the degree of diffusion. It could be measured in economical terms, but factors like social prestige, convenience and satisfaction are also important.

2.1.3 Institutionalisation

Institutionalisation of an innovation implies complex processes of change. To understand the complexity of this process, a conceptual clarification is needed.

Zucker (1987) defines institutionalisation as:

> *a) Rule-like, social fact quality of an organized pattern of action (exterior), and b) an embedding in formal structures, such as formal aspects of organisations that are not tied to particular actors or situations (nonpersonal/objective).* (1987:444)

An institutionalisation process is defined as a process in which components of formal structure become widely accepted as both appropriate and necessary, and serve to legitimate organisations (Zucker, 1983). Normative pressures, often arising from within the organisation itself, influence organisations. The need for change will often be determined by the lack of consensus or degree of conflict within the organisation. Innovations are institutionalised when they are widely understood to be appropriate and necessary components of efficient and rational organisations (ibid). This can be seen in relation to Levine's (1980) concepts: profitability and compatibility.

Zucker (1987) identifies two defining processes of institutionalisation:

> *a) imitative or mimetic, adopting others' successful elements when uncertain about alternatives, and b) normative transmission of social facts, generally from external sources such as the professions* (1987:444)

According to Zucker (1987), there are different theoretical approaches explaining the institutionalisation process that takes place within organisations. She refers to two distinct theoretical approaches: 1) environment as institution and 2) organisation as institution. Environment as institution sees institutionalisation as a response to external pressure. The basic assumption is that institutionalisation is based on reproduction or copying of system-wide social facts on the organisational level (ibid). In other words, institutionalisation is a result of normative pressure. The outcome of the environment as institution is described in the following manner:

> *Organisational conformity to the institutional environment simultaneously increases positive evaluation, resource flows, and therefore survival chances, and reduces* efficiency (Meyer & Rowan (1977) in Zucker 1987:445)

The organisation as institution approach sees institutionalisation as a process that arises within the organisation or from similar organisations. It views organisations as rational actors, albeit in a complex environment (Zucker, 1983). The central process is generalisation, or

meaning creation, at the organisational level. Some of the defining principles of this approach are that a) institutional elements arise primarily from small groups or organisational-level processes; b) formalised organisational structure and process are likely to be both highly institutionalised and a source of new institutionalisation; c) institutionalisation increases stability and creates routines which often improve organisational performance (Zucker, 1987).

These approaches are not incompatible, they rather point to instances when changes in the formal structure of organisations can derive from internal or institutional sources. The process of diffusion and institutionalisation of the invention depends its value for the internal functioning of the organisation (Zucker, 1983).

2.1.4 Views on organisational change

A number of scholars use different approaches to explain change processes. Some are useful to get a better understanding of the mechanisms of change within an organisation when exposed to innovation.

Cuban (1988) distinguishes between first-order and second-order change. First-order changes are defined as changes aiming to make what exists more efficient and effective without disturbing the basic organisational features. There are no intentions to substantially alter the roles of the actors within the organisation.

Second-order changes are motivated by major dissatisfaction with the existing organisation. These changes alter the organisation in a fundamental way. When an organisation goes through second-order changes, new goals, structures and roles are introduced. It will transform familiar ways of doing things with new solutions (ibid).

Cuban uses reforms in schools to exemplify the two categories of change. With first-order change, the goal is to improve quality control. It includes recruiting better teachers and administrators, raising salaries, allocating resources and selecting smart textbooks, etc. Second-order change introduces new structures and roles that transform familiar ways of doing things with novel solutions to persistent problems. Reframing is a keyword that describes second-order changes (ibid).

According to Fullan (1991), most changes in schools since the turn of the century have been first-order change. One reason lies in the mixture of political and educational motives when innovations are generated. He argues that educational reforms often represent symbolic rather than real change. They aim to satisfy community pressure, make the institution appear innovative or to gain more resources. He describes the situation like this:

> *Even good ideas may represent poor investments on a large scale if the ideas have not been well developed or if the resources to support implementation are unavailable* (Fullan 1991:28).

2.2 Innovation processes within higher education institutions

Institutions of higher education are social organisations characterised by traditions, cultures, norms and institutional missions. According to Levine (1980), it is important to look at the organisational facts of life when analysing how it shapes change. Higher education institutions have a certain structure that makes them less receptive to diffusion of innovation and social change in general (Clark, 1984, Clark, 1998, Jaffee, 1998). Clark (1984) refers to Becher and Kogan (1980) who claim that the main constraints on change in higher education are social more than psychological. They depend more on the way the system operates than on the particular stands that its individual members choose to take.

Clark (1984) describes higher education institutions as bottom-heavy organisations, where the system as a whole is peculiarly difficult to change by top-down demands. He argues that higher education institutions are organised around disciplinary units with self-evident and acclaimed primacy in a front line task. Individuals and/or thought groups take an authoritative position at the operational level. They organise their research and their courses autonomously, often with only general guidelines given by the institute or the faculty.

According to Clark (1984), grass-roots innovation is a crucial form of change. Diffusion of an innovation happens often by persuasion:

> *More than elsewhere, changes initiated at the top commonly need the support of interests residing at lower levels. With the characteristic diffusion of types and amounts of authority, and the lower placement of authoritativeness, those at the top generally have to 'carry the field' rather than command it, negotiating with equals and building internal coalitions in order to implement their own desires, even their own 'orders'. The thought group located at the grass-roots level become key participants in implementing policies and reforms* (Clark 1984:124)

Grass-root innovations can be seen in relation to Cuban's (1988) definition of second-order change. They will have a great impact on the institution, but as Fullan (1991) points out, these kinds of second-order changes are unusual.

2.3 Conclusions

As Zucker (1987) points out, pressure to change often arises within the organisation itself. Seen in relation to Clark's (1984) views on higher education institutions, one could argue that an innovation will more easily be institutionalised with a bottom-up approach. The grass-root level, in this study the teachers, should perceive the innovation as profitable for their needs and compatible with their norms, values and goals. This positive perception of the innovation could be an immediate response in the case where the teachers have already identified the need for innovation and the innovation does not deviate from already existing norms, values and goals. But as Clark (1984) argues, diffusion of an innovation will often need persuasion. Boundaries need to expand (Levine 1980). Clark (1984) argues that one approach is to make the grass-root level key participants in the implementation.

The next chapter will describe the role ICT has in higher education, and more specifically how learning management systems are assumed to lead to innovation in the institution's delivery of higher education.

3. Learning Management Systems in higher education.

3.1 Introduction

The use of ICT in higher education has become an important strategic focus, both at a national level and at the higher education institutions. Literature reveals a complexity of reasons for why ICT has been given such an important position in the future of higher education. The reasons are related, among other things, to the contextual trends of virtualisation, internationalisation, lifelong learning and customer orientation that are part of society in general (Collis & Moonen, 2001).

> *Traditional Universities and colleges face a bleak future unless they significantly alter their instructional methods to keep pace with developments spurred by the Internet. In order to survive, these institutions must…understand their own strengths and reputation among the public, and customise their teaching methods to the different age groups of students.*
> (Financial Times 2000, in Collis & Moonen 2001:3)

According to Collis & Moonen (2001), development in higher education is driven by a shared sense of inevitability and urgency*:" if a university does not keep up, does not strive for new cohorts, or to maintain existing cohorts, then it will face even more substantial difficulties that it is now encountering"* (2001:39). Network technologies are seen as necessary strategic tools in this task of keeping up. It comes up to 'you can't not do it' (ibid.)

Collis & Moonen (2001) claim that flexibility has become a key factor. Higher education should change by increasing flexibility in the educational delivery. New technologies facilitate flexibility (ibid).

The aspects of flexibility, frequently emphasised by traditional higher education institutions, include:

- Improving *flexibility in location* where the learner can carry out different learning activities associated with a course. Some or all of these activities can be carried out from a location outside the traditional campus.
- Improving *flexibility in program*. If one assumes that the learner has relevant previous experience, a "tailor-made" subpart of a course can be organised in terms of the individual's needs and interests.
- Improving *flexibility in types of interactions* within a course, giving the individual more freedom to organise her way of studying.
- Improving *flexibility in forms of communication* within a course. It would give more room for targeted and responsive communication than is the case when communication is limited to what occurs during face-to-face sessions such as lectures. Students should be able to ask questions from their own location and at their own time. The instructor should also have flexibility in managing his or her own time in terms of handling communication.
- Improving *flexibility in study material*, giving the students a wider choice of resources and modalities of study material and also letting the students share the responsibility of identifying appropriate additional resources for the course. (Collis, 1998)

3.2 Learning Management Systems

The term Learning Management System (LMS) is one of many collective terms for web based course-management systems created for educational purposes. Some systems are designed for primary and secondary schools, others for universities and colleges. LMS designed especially for universities and colleges can often be used in both on-campus courses and off-campus courses.

An LMS consists of software packages that support some or all aspects of course preparation, delivery and interaction, and allow access via a network (Collis & Moonen,

2001). In general, these systems offer tools for computer-mediated communication; tools for navigation within course content and around the various features and tools available for learning support; tools for course management; and tools for assessment of learning. All these tools are typically made available via a uniform web-based user interface (ibid).

Other terms used for these systems are ‘virtual university’, ‘course in a box’, course support systems, online educational environment and e-learning systems (Collis & Moonen, 2001; Harasim, 2000). E-learning system is a popular name for these systems, but the term is too narrow to use in this context. E-learning is mainly associated with the pedagogical content of the course. The term LMS is used for a total system, functioning as an administration tool for courses and participants, organising the content of the courses and satisfying the functionalities for communication and collaboration (Kristiansen et al, 2002).

Harasim (2000) claims that there are five attributes that distinguish communication in online educational environments and provide a conceptual framework to guide design and implementation of online courses:

- Many-to-many (group communication)
- Any place (place-independent)
- Any time (asynchronicity, time-independence)
- Text-based (enhanced by multiple media)
- Computer-mediated messaging

(Harasim 2000:49)

A variety of resources are available within the different LMSs. Collis & Moonen (2001) have collected the majority of these resources in table 3.1. Table 3.1 serves as an overview of the possibilities generally offered by different systems. However, the systems available vary. Each LMS has its specific usability developed as a result of a perceived need among its clients. As a consequence each LMS is constantly changing its interface, developing new functionalities to be competitive on the e-learning market. Table 3.1 gives a broader understanding of how an LMS can be used in higher education.

Learner Tools	Support Tools
Web browsing:	*Course tools:*
Accessibility	Course planning
Bookmarks	Course managing
Multimedia	Course customizing
Asynchronous sharing:	*Lesson tools:*
e-mail	Instructional designing
BBS file exchange	Presenting information
Newsgroups	Testing
Synchronous sharing:	Data
Chat	Marking online
Voice chat	Managing records
Whiteboard	Analysing and tracking
Application sharing	*Resource tools:*
Virtual space	Curriculum managing
Group browsing	Building knowledge
Tele-conferencing	Team building
Student tools:	Building motivation
Self-assessing	*Administration tools:*
Progress tracking	Installation
Searching	Authorisation
Motivation building	Registering
Study-skill building	Online fees handling
	Server security
	Resource monitoring
	Remote access
	Crash recovery
	Help desk tools:
	Student support
	Instructor support

Table 3.1 (Collis & Moonen 2001:79)

3.3 How an LMS generates innovation in higher education - a literature review

A Learning Management System is not necessarily an innovation itself. It is a tool that may promote innovation in higher education and in educational delivery by facilitating new, innovative behaviour in organisation and teaching. The LMS can facilitate major changes in the educational delivery because of the new possibilities of increased flexibilities. It is a tool that can facilitate communication and distribution of information between students and teachers, making the information flow easier and more efficient. It can facilitate collaboration between students, making them less time- and place-dependent. It can also make it possible to reach out to new markets of distance learners by using a more flexible distribution of courses.

Much research has been done concerning the impact of ICT tools on the educational delivery in higher education. The starting point is often an optimistic belief that the use of such tools will indeed change higher education and lead to more efficient and flexible educational delivery (Fisser, 2001; Collis & Moonen, 2002; Bates, 2000). These beliefs motivate many higher education institutions to experiment with new information technologies like LMS (Bates, 2000). According to Bates (1997), the four most frequent reasons given to use educational technology are:

- To improve access to education and training
- To improve the quality of learning
- To reduce the costs of education
- To improve the cost-effectiveness of education

(Bates, 1997:3)

It might be of interest to ask to what extent these beliefs are supported by the research done on the benefits of ICT – featuring LMS - in education.

First, regarding the two last reasons related to cost-effectiveness, a literature review indicates that on-line learning is suitable for mass-production and reproduction of courses, and therefore may reach a larger student body at the same cost (Hazemi et al, 1998). However,

critical research reveals an uncertainty as to the degree of cost-effectiveness when using on-line learning.

> *While the potential of ICTs to reduce costs is often cited, there is very little evidence of cost reduction and there is little research to support the contention that ICT use in education is cost-effective* (Keogh 2001:225).

According to Keogh, it is difficult to find studies documenting improved educational output per unit cost. On the contrary, research shows that deployment of technology in traditional modes of teaching often implies additional expenditures. *"Faculties report increased time involvement in instruction as a long-term proposition because of the greater contact with students on-line"* (Keogh 2001:122). Concerning cost effectiveness for teaching and learning, Keogh points to the uncertainties of the return of investments. According to him, the e-learning systems have considerable initial investment and relatively high recurrent costs, and yet, it is difficult to prove significant impact on learning outcome.

Secondly, regarding the two first reasons related to pedagogical advantages, ICT is argued to facilitate new and better pedagogical methods (Jaffee, 1998). New technologies generate a new concept of teaching and learning with new ways of delivering higher education that overcome the inadequacy of our current one-size-fits-all and face-to-face approach to teaching (ibid). Some claim that the use of ICT and on-line learning has special advantages for the learning process:

> *The potential of ICT for reconstructing education and learning is manifold:*
>
> *Different perspectives and accesses to the same topic can be used to provide cognitive flexibility.*
>
> *Interaction facilities provide learners with opportunities for experimentation, context-dependent feedback, and constructive problem solving.* (Krämer & Schmidt 2001:196)

Some argue that the use of ICT in education involves a new paradigm for teaching and learning, opening for new pedagogical methods based on collaboration and problem based learning (Harisim, 2000). Koschmann (1996) has developed the term Computer Supported Collaborative Learning (CSCL) to describe this paradigm shift. Collaborative learning is

defined as: *"a learning process that emphasises group or cooperative efforts among faculty and students. It stresses active participation and interaction on the part of both students and instructors"*(Hiltz 1997:3). According to Hartley (1999), collaboration in practice is usually aimed at achieving: "*a) work sharing; b) using different knowledge and expertise to improve quality and/or take account of varied viewpoints; and c) building or consolidating a (learning) community"* (1999:3).

The literature using a theoretical approach to analyse the connection between ICT and new pedagogical methods is extensive. However, a literature review indicates that there are only a limited number of studies focusing on the actual pedagogical outcomes of the use of ICT. This is above all true for the use of ICT in higher education. The few articles that are found relate either to studies evaluating student results, or studies measuring general user satisfaction. In the first case, the studies available indicate that there are no significant difference in results between students participating in online courses and students participating in traditional courses (Spiceland 2002; Sandercock 1999). It indicates that the two forms could be equally valuable. However, there are sets of uncertainties connected to the conclusions drawn from these studies. The researchers question the representiveness of the groups selected and will hence not use these findings to generalise (ibid).

One study on students' satisfaction indicates that a small student majority prefers a traditional educational format to a distance education format. The study indicates little difference in satisfaction levels between the two educational forms (Allen, 2002). Another study indicates the opposite result. In this case there was a clear pattern that students in the experimental Internet section had a more positive feeling about the course (Wegner & Holloway, 1999).

These studies indicate that there are many uncertainties concering what effect ICT has on learning. The general outcome from the use of ICT in education seems to vary from institution to institution, from teacher to teacher and from learner to learner.

3.4 Conclusions

Despite the uncertainties around the educational output and the cost-efficiency, literature reveals that the use of ICT tools such as LMS can have a substantial impact on an institutions' delivery of education. It can generate innovations related to communication practises, making communication between teachers and between teachers and students more flexible and efficient. It can also generate innovative pedagogy. Teachers can explore functionalities such as lesson tools, asynchronous/synchronous communication tools and construct new teaching methods inspired by new pedagogical paradigms such as Koschmann's Computer Supported Collaborative Learning. Even though the cost-effectiveness of an LMS is questioned, it has been used as an argument for the use of ICT in higher education (Bates, 2000; Hazemi et al, 1998). A possible innovation could thus be to exploit the possibilities of group-communication, place-independent and time-independent communication to obtain a more cost-effective delivery of higher education. The LMS can also facilitate new business opportunities by attracting new student groups with a need for a more flexible course delivery (Collis & Moonen, 2001). Innovation in this case will be to develop and start distributing these types of courses.

Together with the literature on innovation, dicussed in chapter 2, this chapter's literature review about the use of ICT and LMS in higher education institutions will be used in the next chapter in the development of a theoretical framework for this study.

4. Assumptions about the general impact of LMS

The implementation of an LMS seems to be driven by optimistic expectations about a more efficient and flexible educational delivery through the use of ICT in higher education (Bates, 2000, Collis & Moonen, 2002, Fisser, 2001). In this study, these expectations will be used as assumptions about the impact of an LMS on educational delivery.

These assumptions function as an operationalisation of Levine's (1980) two concepts, profitability and compatibility. The purpose is to make it possible to evaluate to what degree the LMS Blackboard will be institutionalised at the two higher education institutions, BI and HiBu. Van der Wende's (1999) model (figure 2.1) will be used as a tool to estimate the outcome of the innovation process at the two institutions. There are uncertainties around the assumptions formulated in this chapter. They may prove to be inaccurate theoretical constructs that do not give useful information about the interviewees' perceptions of profitability and compatibility (Judd et al, 1991). There will therefore be a discussion in the last chapter about the relevance and appropriateness of the assumptions.

4.1 Assumptions about Profitability

> *If the application is successful in accomplishing a noticeable improvement in some important area of teaching or student learning, and if it does so in a manner highly visible and attractive to the early adopter's mainstream peers, then it has a chance of being adopted into the mainstream population. This will not occur, however until the costs of adoption (time, money, disruption to normal activity, etc.) are perceived by the mainstream to be significantly less than the positive value to be gained from adoption.* (Geohegan, 1994, in Jaffee ,1998)

Generally speaking, the more profitable an innovation is for the actors involved, the more likely it is that the innovation will be institutionalised. This is expected also to apply to the introduction of an LMS in a higher education institution.

As discussed in the privous chapter, expectations regarding to ICT in education are related to; communicational advantages, pedagogical advantages and economic advantages. The proposed assumptions about profitability hence are:

1. AN LMS will improve the communication channels between the teachers and the students, and among the teachers.
2. AN LMS will improve pedagogical methods and help teachers to become more innovative.
3. AN LMS will make the educational delivery more cost-efficient.
4. There is a need to become more competitive in the educational market. AN LMS will help to create new business opportunities and thus make the higher education institution more competitive.

4.2 Assumptions about Compatibility

Generally speaking, the more compatible an innovation is with the values, norms and goals of the actors involved, the more likely it is that the innovation will be institutionalised. Again, this can apply to the introduction of an LMS in a higher education institution.

It is here necessary to identify some of the characteristics of an LMS, and then formulate assumptions about compatible norms, values and goals that should be held by the actors involved to make institutionalisation possible.

First, an LMS is said to open for a flexible organisation of teaching and learning. If this is the case, those who implement the LMS must be open towards a more flexible organisation of teaching and learning.

Secondly, the use of an LMS implies the use of technology. It is therefore important that the users of the LMS have a positive attitude towards the use of technology in education.

Thirdly, an LMS can imply the use of new innovative pedagogical methods, for example through expanded use of on-line collaboration between students and individual supervision. It

is thus important that the users of the LMS have a positive attitude towards new pedagogical methods.

Fourth, the successful implementation of an LMS will imply some degree of change, either related to pedagogical methods or practical organisation of teaching and learning. It is hence important that the users show openness to change.

In order for an LMS to be implemented and adopted, the involved teachers and administrators should show:

1. Openness to a more flexible organisation of teaching and learning.
2. Positive attitude towards the use of technology in education.
3. Positive attitude towards new pedagogical methods.
4. Openness to change.

4.3 Conclusions

In the analysis, the assumptions about profitability and compatibility will, to a certain extent, be seen as conditions for institutionalisation of Blackboard at the two higher education institutions, BI and the college of Buskerud. If they are valid as theoretical constructs, the chances of institutionalisation improve, if the teachers and the administration agree that Blackboard facilitates better communication channels, improved pedagogy, cost-efficient educational delivery and new business opportunities. If Blackboard also fits the institutional values and goals in accordance with the assumptions about compatibility, the chances for institutionalisation increase.

All these assumptions are summing up what has been presented in the literature regarding the impact of ICT in higher education. It is expected, however, that the different actors at the higher education institutions value the distinct ‘profitability’ factors differently. In accordance with Clark’s (1984) description of higher education institutions as bottom-heavy organisations where the individual academic has an autonomous and authority position, one could expect the teachers to be divided on their views on how, when and where Blackboard is profitable for them. Some would emphasise the importance of Blackboard as a communication channel,

others emphasise the pedagogical aspects, and others again the possibility of cost-efficiency or new business opportunities. One can also expect the teachers and the administration to be divided in their perception of profitability. In the analysis, teachers and the administration are considered separately to identify these differences, and to see how these differences will influence the institutionalisation process.

5. Case descriptions

5.1 Introduction

In this chapter, BI and HiBu cases will be presented, as well as the factors affecting the implementation of Blackboard at the two higher education institutions. First, Blackboard and its functionalities will be described. Secondly, the organisational characteristics and the strategic emphasis on ICT at the two institutions will be described. Thirdly, the two institutions will be compared in relation to their history, organisational structure and strategic focus concerning ICT in education. Finally, the methodological process behind the data collection will be outlined. Information presented in this chapter is based on document analysis and interviews with chosen interviewees, representing both the administration and teacher staff at the two institutions.

5.2 Describing the Learning Management System, Blackboard

On the Blackboard website (www.blackboard.com), Blackboard presents itself as the leading enterprise software company for e-Education. It was founded with a vision to transform the Internet into an environment for education experience.

In 1997, Blackboard LLC was formed, and it was contracted to help leading the formation of the Educause IMS standards group for online education technology. Educause is an American, non-profit association whose mission is to promote the use of information technology in higher education (http://www.educause.edu/). At the same time, a student-faculty team at Cornell University was developing a software product for online education, with a possible scalability for wider institutional application. Recognising the high demand for a sophisticated, easy-to-use and affordable online education software platform, the two groups merged in June 1998 to form Blackboard Inc. (http://www.blackboard.com/about/index.htm)

The basic philosophy behind the construction of the Blackboard system is claimed to be user- friendliness. Intuitive understanding and simplicity are seen as the most fundamental criteria for an e-learning tool to be successful. Thanks to this user-friendly environment, Blackboard Inc. supports flexible use of pedagogy inside educational and teaching settings (Yaskin, 2002).

From its website, Blackboard has a high potential of scalability. This means that a course or a group easily can be enlarged to include more members. This can make it attractive for higher education institutions with large numbers of students (Yaskin, 2002).

The different user options in Blackboard are presented in a vertical frame menu where the user can navigate by clicking on the different choices. These choices include: Announcements, Course information, Staff information, Course Documents, Assignments, Books, Communication, Discussion Board, External Links and Tools. The student connects directly to his or her course and can look up course materials, messages and assignments. There are no obligations built into the tool concerning to which degree the teacher must use the functionalities. The teachers may enable the different tools when they are needed (see appendix 3 and 4).

5.3 BI Norwegian School of Management

BI Norwegian School of Management is a private non-commercial foundation, founded in 1943. It offers education in economics, business administration and management, and is the second largest higher education institution in Norway with a total of 19,500 students, including 9,500 part-time students at 23 colleges across the country (Annual Report 2001). BI is also engaged in distance course programs with China and Lithuania. BI has about 400 academic associates, responsible for the course curriculum for all the subjects taught at the 23 colleges. There are about 800 college lecturers, teaching in the national wide BI system. BI has a course-distributed model, with centralised administration and faculty units in BI Sandvika, responsible for quality of subject content and pedagogical design of the courses.

In 2001, BI's revenue was approximately 840 Million NOK. Public funding constituted 10,9% of total revenues (Annual Report, 2001).

BI has a relatively long tradition of using IT in education. Interviewees claim that already in the 1970s IT was used as educational support. At the time the activity was basically ad-hoc initiatives, strongly connected to individual teachers. Around 1980 the central administration became more interested in the use of IT in education. They initiated some projects and started to develop the infrastructure and support for IT activities. According to an informant, the strategy at the time was based on the idea that IT-tools would accelerate the learning process.

At the end of the 1980s the administration at BI was concerned with the direction in which the educational market would develop. Some of the actors involved saw a potential in using IT and communicational tools to mediate education in a new way. Others argued that adult education could be more cost-effective using new technologies. A growing market for adult learners would need a more flexible educational delivery to combine work and studies. As a result, a centre for distance education was established in 1989. As this centre has developed independently of the mother institution, the strategic interest for IT in education has declined at the campus-based institution. The centre for distance education launched its own Internet based learning tool, Apollon, in 1996. For the on-campus students, the use of ICT in education continued to consist of isolated, ad-hoc initiatives, dependening on enthusiastic individuals. It was not until the strategic plan of 2000-2002, that ICT was put on the agenda as an institutional priority. In this document, one of the main visions for BI was to become a leading actor in the use of ICT in the educational market. Some informants claim that this shift came as a result of an external international quality evaluation of BI by the European Quality Improvement System (EQUIS) in 1999. The EQUIS report evaluated the ICT strategies at BI as insufficient for exploiting the full potential of ICT in relation with teaching and learning.

As a consequence of the EQUIS report, a working group was set up in 1999 to look more closely into how ICT could be used as an educational tool. The work of this group resulted in a report called "IKT i undervisningen" or "ICT in education". In this document, it was emphasised that BI should adopt a holistic approach to the implementation of ICT. One of the most important challenges would be to update the infrastructure. At that time the

infrastructure was not properly developed, and could not meet the important challenges in the implementation of a more systematic use of ICT in education in the whole institution. The working group suggested, as an explicit overall goal, that BI should implement an electronic learning system by fall 2001. This goal became one important element in the strategic plan for BI 2000-2002:

> *BI must integrate the use of Information- and communication technology in all value creating activities and supplement the classroom with a virtual learning arena.* (Strategic plan 2000-2002, personal translation)

To support this ambition, three main goals were formulated:

- *Assure sufficient infrastructure and support.*
- *Implement a net based learning system in more courses.*
- *Ensure more efficient administrative work processes by using ICT.*
  (Strategic plan 2000-2002, personal translation)

A consequence of this strategy was that a second work group was established with the mandate to come up with concrete suggestions, described in the report "Taskforce ICT" in September 2000.

> *ICT Task Force's main objective is to identify central success criteria to realise the ICT-strategy. This includes elements like ICT-structure, ICT-competence and capacity profile (*Task Force ICT 2000, personal translation)

The report reflected the strategic plans of developping infrastructure, introducing a net based learning system and improving the administrative work processes. In order to make BI a leading actor in the use of ICT in education, one recommendation was to emphasise pedagogical use of ICT. The aim was to make learning processes more efficient. The centre for distance education was suggested as an important competence builder on this area.

One of the main conclusions from this report was that it was urgent for BI to start testing different e-learning platforms. One of the arguments was that BI lagged behind comparable institutions in Europe in the use of ICT in education.

The strategic process, leading to the creation of the Task Force ICT group, seems to have been initiated by the central managers at BI as a result of a perceived need to be competitive in relation to other European business and administration colleges. However, informants who worked with the ICT Task Force report expressed some frustration about the way this report was received by the directors of the institution. Only a short version of the report, in which many important elements were left out, was read. However, informants expressed satisfaction in respect to to what parts of the report that had been taken into consideration and were implemented. This applies especially to aspects concerning infrastructure and improvements of the administrative work processes.

At BI, the directors and managers are responsible for the formulation of institutional strategies. Both administrator and teachers informants argue that there has been dialog between the administrators and the pedagogical associates based at BI Sandvika. It is not clear what kind of role the teachers at the different BI colleges have played in this process. In general, the informants claim that actors with a special interest in ICT, who expressed their opinion on the subject, very often were taken into account in the decision making process. This is reflected in the composition of the Task Force ICT group that included people from the central management, from the IT staff and from the pedagogical staff.

As a direct result of the ICT Taskforce report, the project "PåNett" (literally "on the net", or "wired") was initiated. The mandate of the project was to supply the classroom with a virtual learning arena, as described there:

> *The purpose of the project is to adapt the course activities at BI to a virtual learning arena. This is to enable the pedagogical associates to use new teaching methods by using ICT and good learning strategies, so that BI will be the preferred supplier of economic and administrative education in the years to come.*

> *The goal of the project is to initiate activities towards the institutes and business cooperatives. This will contribute to the coordination of technical implementation and personal process-oriented tasks that the implementation of a net-based learning system will imply*. (Project mandate, adopted by the board 26. February 2001. Personal translation)

The project was stipulated to last for 2 years. It started with some pilot projects in which the use of ICT was tested in smaller units. The largest of these projects ended in Spring 2002. It was carried out at 6 BI colleges with 2311 students and 11 teachers participating, using the course 'marketing management' as a test group. In the evaluation both teachers and students were satisfied with the project. This pilot was carried out on Apollon as the campus students still were waiting for the implementation of a learning support system. In spring 2002, the PåNett project and ICT department, together with the top management, decided to implement Blackboard version 5 on campus. Distance education students already had Apollon as a tool. The implementation project's overall goal was to give the lecturers a teaching support tool and the students a learning support tool online. In August 2002, Blackboard was launched for 16000 students and 900 lecturers. To succeed in implementing Blackboard, the project had defined minimum requirements for what the students and lecturers could expect from the support system, including personal assistance and support. The support system included one responsible from each college and a centralised team. The design allowed for the course syllabus to be published,.All information previously communicated through announcements and course material (including lecture notes) would be distributed electronically through Blackboard. Electronic library services and study handbooks were made available. At course level it was up to each teacher to what degree he or she would use the system.

A survey conducted among all teachers at BI in December 2002, indicated significant use of Blackboard. Around 40-50% of the respondents used Blackboard to some extent in their lectures. About 23% did not use Blackboard at all.

5.4 The College of Buskerud (HiBu)

The College of Buskerud (HiBu) consists of 3 departments that until 1994 were in fact three independent colleges. They merged as a result of a college reform, aiming to reduce the number of colleges in Norway. They have kept their original areas of specialisation, and are still relatively autonomous.

The department in Hønefoss previously was a teacher college. Its area of specialisation is pedagogical education focusing on economic and administrative subjects. It also offers courses in informatics and economics. In 2001, 830 students were registered.

The department in Kongsberg is traditionally an engineering college. It offers IT-engineering courses, orthopaedic, and economics and administration. In 2001, 760 students were registered.

The department in Drammen is specialised in nursing programmes. In 2001, 460 students were registered. This department has not been included in the study because it was reported to have a very passive role in the implementation of ICT.

Because of separate histories, there is relatively little cooperation between the different departments. They have distinct organisational traditions, which have been kept more or less untouched after the merger in 1994.

The two departments included in the study have relatively long traditions in the use of IT tools in education.

Hønefoss started as early as the 1970s with courses in computing. The department is relatively small and loosely organised. The different fields of study are organised within separate sections, but traditionally there has been a lot of cooperation between the different sections. Teachers often teach across sections and their offices are situated close to each other. The experience the IT section has had with the use of IT as a support tool for education has influenced and motivated teachers from other sections to experiment with IT in their courses.

Kongsberg is a traditional industrial centre, and the college has historical ties with the local industry. The industry in Kongsberg started early to design and manufacture computers, and the computing education started with local demand for specialised engineers.

The use of ICT has thus been a continuous process at the two departments. Partly as a consequence, the competence in using ICT in education generally seems relatively high. Both

departments got Internet connection in the beginning of the 1990s. Three to fours years later, more or less all the staff had started to use Internet and e-mail.

Blackboard was implemented at the entire HiBu in spring 2000. A project group called "Preparing for learning on the web" continued this implementation process. The creation of the group was an initiative taken by some of the teachers, mostly from Kongsberg, and supported by the administration. This group consisted of teachers from all three departments. Their objective was to select one LMS that could serve the HiBu institution as a whole. They tried out different systems for learning and communication. There was a growing need for a common platform, covering the user options earlier served by several platforms and making the organisation of technical support easier. After an evaluation of different LMS, the group concluded that HiBu should implement Blackboard as the common LMS solution. Blackboard was the preferred tool, based on a total evaluation of user friendliness, pedagogical elements, use of open standard solutions, scalability and future stability (Internal report from the "Preparing for learning on the web" group, 2000).

The implementation process at HiBu was initiated as a result of an institutional strategic vision: the college wanted to use ICT to become more competitive on the educational market. This is reflected in the strategic plan for 2001-2005:

> *The implementation of flexible teaching forms and explorative activities when it comes to teaching via the internet will make the college better prepared to continuous growth* (Strategic plan 2001-2005, personal translation)

The goals concerning the use of ICT are formulated in general terms:

> - *The college should become more attractive through an expanded use of flexible learning methods.*
> - *The college should be recognised among the most advanced colleges in using new technology, new learning methods and research based teaching.* (Strategic plan 2001-2005, personal translation)

Furthermore, the teachers also played an important role in this process. The project group "Preparing for learning on the web" was initiated by teachers. Informants claim that this

process mainly has been teacher-driven. The administration has been positive and supported the different initiatives as a reaction to the concrete steps taken by the teachers in the innovation process.

Like the strategic plan indicates, the motivation for implementing an LMS is closely connected to pedagogical advantages.

The implementation of Blackboard is also connected to a clear motivation to expand distance-learning activities. In the report from the “Preparing for learning on the web” group, the economic potential in net-based learning is emphasised. HiBu has already experience with distance education through “Fokus Ringerike”, a separate unit established in 1987, offering continuing education and consulting services for local, regional and national actors, within the subject area of HiBu in Hønefoss.

When Blackboard was implemented at HiBu in Spring 2000, the project group “Preparing for learning on the web” reorganised and became a permanent working group called “Learning on the web”. Its mandate was now to administrate and promote the use of Blackboard among teachers and students. They were given the responsibility to coordinate part of the teachers’ training on the system. The other part of the training was the local responsibility of each department. For that purpose, support sections at each department were to respond and help teachers with day-to-day problems.

One of the first objectives set by the “Learning on the web” group was that all courses offered at HiBu should have their own homepage and a minimum level of activity in Blackboard. This implies that general course information should be available; information should be communicated through Blackboard; and lecture notes should be distributed electronically through Blackboard.

5.5 Comparative description

The two cases chosen for this study have many fundamental differences. One is related to ownership: BI is a private foundation, while HiBu is a public institution, owned by the state. BI depends on the revenues from students and other sources, which makes BI more

competition oriented and therefore more motivated to create new business opportunities by using new technology for distance courses. An evidence for this is the centre for distance education and their development of the LMS, Apollon. HiBu is funded by the state, but is expected to cover a certain percentage of the budget through externally paid activities such as consulting and distance courses offered through “Fokus Ringerike”. However, these activities represent a minor percentage of the total budget (Virksomhetsplan for 2002, Høgskolen i Buskerud).

Another difference is the size of the institutions: BI includes 23 distributed colleges, while HiBu consists of 3 autonomous colleges. The centralised administration, the academic associates and college lecturers all need a system to communicate and to distribute course material to all BI colleges. There is less contact between the three HiBu colleges; their need for an LMS tool is thus more differentiated. The subjects taught at the two institutions also separate them. With some variations, BI offers a similar course portfolio in all the 23 colleges. HiBu’s three colleges are specialised in different subjects.

The similarities are related to their focus on the use of ICT in education and the implementation of Blackboard. Both institutions claim to have long traditions of using technology in education. When the study started in spring 2002, HiBu had longer experience with the use of Blackboard. HiBu had implemented Blackboard in spring 2000, and BI in fall 2002. The administration at the two institutions had a somewhat similar strategic focus on the use of ICT in education; both wanted to be recognised as leading actors in the use of ICT in education. However, they played a different role in the implementation process. The administration at BI initiated and directed the implementation of Blackboard. At HiBu, the administration mainly supported the implementation of Blackboard that wasinitiated and driven by the teachers.

6. Presenting the findings

6.1 Introduction

In this chapter the findings from BI and HiBu will be analysed together with the assumptions about profitability and compatibility of Blackboard. Each institution will be analysed in separate sections. In the last section, the two institutions will be compared and some general conclusions will be drawn.

6.2 Case analysis of BI Norwegian school of management

6.2.1 Perceived Profitability

Assumptions discussed earlier state that the perception of profitability will be high if:

1) Blackboard contributes to improve the communication channels between the teachers and the students.
2) Blackboard contributes to improve pedagogical methods and helps teachers become more innovative.
3) The use of Blackboard can help creating new business opportunities, such as opening up for distance learners, and therefore make BI more competitive on the educational market.
4) Blackboard can make the educational delivery more cost-efficient.

Teachers views on profitability

- **AN LMS will improve the communication channels between the teachers and the students, and among the teachers**

When asked to what degree they felt a need for an LMS such as Blackboard before it was implemented, the interviewees offered a broad range of answers, from rejection to positive expectations of a need. One interviewee, who claimed not to have felt a need for Blackboard, argued:

> *I didn't feel a need because I copied the lecture notes to the students, and the information I needed to give, I gave them in class. If not, I used e-mail*

Another interviewee argued that the former communication channels did not satisfy his needs because the routines were inconvenient. Between these two opposed views, the majority of the interviewees expressed a more neutral attitude towards perceived needs to improve the communication. All interviewees in this group were responsible for courses given at different BI colleges, and they claimed that they used to solve their communication problems in the time before Blackboard was implemented by creating personal web pages. However, they have now integrated Blackboard in their courses, and use it as a communication channel connecting students situated in Sandvika, which is also the interviewees' office location. In the different colleges, web page solutions are still perceived as more convenient by all. One explains why:

> *Switching to Blackboard would be difficult because much of our communication directly with the students at the BI colleges goes through our web system. When our editor in England had delivery problems, we were dependent on a direct contact with our students. This wouldn't be possible in Blackboard because I would need access to their student number.*

When asked about Blackboard's impact on communication between teachers, the interviewees were again divided. One interviewee mentioned experiences with virtual "staff rooms". These staff rooms were meant to give teachers new communication arenas to discuss and exchange experiences. This was characterised as an important step towards a more

integrated use of Blackboard as a communication tool among teachers. Others claimed that this kind of virtual discussion forums for teachers was not profitable for them. They claimed that face-to-face communication was more efficient, and perceived e-mail as a more reliable communication tool.

On the other hand they all saw the advantage of having a common communication tool to distribute information to students. A corresponding positive effect reported was the reduction of telephone calls. Blackboard has become a more common channel for students to retrieve information.

The interviewees who were more reluctant to the impact of Blackboard preferred to use "simplify" instead of "improve" when describing the distribution of information to students, but these interviewees claimed that Blackboard itself has not improved the communication. It only replaced or complemented an existing communication system perceived to be sufficient.

As a partial conclusion, one can say that Blackboard as a communication tool has not generated over-enthusiastic reactions from the questioned teachers. All of them expressed a need to communicate and distribute information electronically, and with the exception of one interviewee, tools like e-mail and web pages were considered sufficient. However, it must be encouraging for BI to note that most interviewees expressed a positive attitude towards Blackboard as a communication tool. A result that allows for further experimentation. On the other hand, Blackboard as a teacher's "staff room" has not functioned as expected..

- **AN LMS will improve pedagogical methods and help teachers to become more innovative**

When asked to what degree the teachers felt a need to improve their pedagogical methods and adopt more innovative teaching methods, all the interviewees were positive. One expressed it like this:

> *I always feel a need to improve my teaching methods. To be a good teacher is a continuous process of renewal, something that you never finish.*

When asked if they regarded an LMS such as Blackboard as a tool to improve pedagogical methods, 4 out of 5 interviewees agreed. However, they claimed that it is only one out of several approaches. One argued:

> *Yes, it is one of several ways to improve the education, but it is an important contribution. It gives several possibilities to try new and innovative methods.*

The interviews revealed that the interviewees had different views on how Blackboard could contribute to improve pedagogical methods. One reflected critically upon how such an electronic tool most efficiently could benefit pedagogical methods. He was very sceptical to abandon classroom teaching for electronic dialogue. He concluded that Blackboard should remain a tool, which, by making information and course material available, would allow students to be more prepared and so facilitate face-to-face meetings. Another interviewee claims that his motivation to implement Blackboard came from a belief that Blackboard could facilitate innovative teaching:

> *Those were actually the qualities of the tool that I was most concerned about. When you have that kind of tool, you must use it to create new learning arenas.*

However, he was disappointed in how Blackboard functioned as a pedagogical tool. He had tested out new ways to organise some of his courses by limiting the number of lectures and replacing them with optional electronic support on Blackboard in combination with case related group work. Results from the exams did not deviate from previous exams however, the students where very unsatisfied, and it led to a massive criticism of him as a lecturer.

One interviewee was critical to how Blackboard could contribute to pedagogical innovations. He agreed that electronic communication could facilitate a better individual supervision of the student. He however, preferred to use e-mail for this kind of communication because he found it easier to manage.

The interviewees had a somewhat abstract view on how Blackboard could benefit pedagogical delivery. Although they expected Blackboard to allow for new pedagogical

methods, most of them were uncertain concerning how they could change their educational practice. One explained:

> *I don't think I'm going to do some pedagogical stunts that include Blackboard in a bigger or lesser extent at this point. I don't see how I can do that.*

To bridge the gap between expectations and the practical use, one interviewee suggested an extensive training to make teachers more able to exploit the actual pedagogical possibilities of Blackboard. A survey conducted in December 2002, by the "PåNett" project team to evaluate the implementation of Blackboard, supports this argument and indicates that a majority of the teachers wishes more training in the pedagogical possibilities of Blackboard (Swanberg & Munch-Olsen, 2002).

As a partial conclusion on this assumption, it seems that teachers expect Blackboard to be an innovative pedagogical tool, but that they need training to experiment with the possibilities it really offers. However, the negative experience one of the teachers had when trying to replace traditional courses with online supervision, indicates that such innovative pedagogical use of Blackboard may meet resistance among students, and that experimentation is needed to find the most effective use of Blackboard.

- **There is a need to become more competitive on the educational market. AN LMS will help to create new business opportunities and thus make the higher education institution more competitive**

When asked to what degree distance students were important to them, all interviewees stated that they considered distance students to be equally important to campus students, but reported to have no direct responsibility for this student group. The opportunity to become more competitive and create new business opportunities through an LMS like Blackboard did obviously not concern the interviewees. This may be explained by the fact that BI for many years has had a centre for distance learning, taking care of the market of distance students, and because none of these interviewees had developed courses for this Centre.

- **AN LMS will make the educational delivery more cost-efficient**

Cost-efficiency is not perceived as an important issue for the teachers in this study. All the interviewees claimed that the quality of their teaching was more important than cost efficiency. The advantage teachers emphasised was that they spent less time copying and could therefore have more time to prepare the lectures. In relation to this, they emphasised the advantage of distributing compendiums electronically. One interviewee explained how this worked out in practice:

> *One could, as far as I know, distribute electronically saved documents within closed forum. It means that I avoid making compendiums in advance to the classes. I can use Blackboard to post the articles in Pdf format that I find in our full text databases. The students can then consider if they will take the costs of copying it or keep it electronically.*

- **General satisfaction of Blackboard**

When asked to what degree Blackboard satisfied their needs as teachers, four out of five expressed at least some degree of satisfaction. In general the satisfaction was related to standardisation, distribution of information and the increased possibilities to supply course materials with resources from the web. One interviewee claims that it contributes to increase the teaching quality.

Dissatisfaction was either associated with non-activated user-options, problems directly related to how Blackboard adopted BI's course organisation, or to specific aspects of Blackboard. First, BI has decided to not include discussion forums in the standard course menu. Those who were motivated to try discussion forums felt restricted. Secondly, Blackboard did not allow an easy distribution of the same course to several classes. Thirdly, some argued that the editorial possibilities in Blackboard were inadequate in the distributed course model at BI. One formulates the problem like this:

> *Blackboard does not have a good editor. We are used to write home pages, and not to navigate through the small window in Blackboard, and in addition code everything in HTML yourself, it is just incredible.*

None of the interviewees, who express dissatisfaction with Blackboard, gave the impression that it could lead to a disruption of the use of Blackboard. However, one interviewee claimed that the use of Blackboard is based on a cynical assessment of cost effectiveness:

> *The moment I realise that I spend more time with Blackboard than the time I save on electronic distribution, I'll stop using it!*

Administrators views on profitability

The administrators' view on profitability is based on interviews conducted in the first phase of this study, before Blackboard was implemented at BI as a whole, and the strategy documents which represent the official institutional strategies on how Blackboard is supposed to serve BI. Blackboard was at that time only implemented in a limited number of courses, which could explain why their perception of profitability often was based on general and visionary views. As indicated in the case description, one of the most important goals for BI on the strategic agenda for 2000-2002 was to become a leading actor in the use of ICT.

- **AN LMS will improve the communication channels between the teachers and the students, and among the teachers**

There is no explicit emphasis on the communicational values of Blackboard in strategy plan 2000 – 2002. It however seems to be an implicit expectation because BI wants to use information- and communication technology in all value-creating activities by supplying the classroom with a virtual learning arena.

One interviewee was more specific and argued that the implementation of Blackboard should create more efficient communication channels. According to another interviewee,

Blackboard should first of all function as a publication solution. This implies a one-way communication channel.

- **AN LMS will improve pedagogical methods and help teachers to become more innovative**

The strategy plan introduces the implementation of an LMS by saying that it would supply the classroom with a virtual learning arena. Interviewees from the administration argued that an LMS like Blackboard should function as a pedagogical tool to create new learning models.

- **There is a need to become more competitive on the educational market. AN LMS will help to create new business opportunities and thus make the higher education institution more competitive**

BI has a centre for distance learning, focusing only on distance courses. The BI-campus has hence no need to attract this student group by using Blackboard. However, one of the main goals on the strategic agenda for 2000-2002 is to become a leading actor in the use of ICT, and this is an implicit emphasis on competition. There could be an underlying assumption that BI would attract more students if they were known as a leading actor in the use of ICT.

The interviewees have not directly confirmed this, but they focus on the need for the institution to be ahead and be recognised by students as a technological advanced institution.

- **AN LMS will make the educational delivery more cost-efficient**

An additional aim, articulated in the strategy, was to make the administrative work processes more efficient with the help of ICT. One interviewee argues that one of the motives behind the use of ICT was to make the educational delivery more efficient and facilitate distribution of lectures to more students at reduced costs.

As a partial conclusion, the implementation of Blackboard seems to have a foundation in all four profitability assumptions, with a specific focus on cost-efficiency and a desire to improve

the quality of educational delivery. The adoption of an LMS was based on 1) the critical evaluation of BI's ICT strategies in the Equis-accreditation report, and 2) the visionary aspirations that an LMS like Blackboard could create new learning models, making communication more efficient and reduce costs.

Role of administrators and teachers in the innovation process

The administration seems to have had a major influence on the first two phases of the innovation process. They identified a need for change, partly because of the Equis accreditation report, and then they established a strategic focus to implement an LMS. Interviewees from the administration claimed that it has been both a top-down and a bottom-up process. The administration has taken the initiatives and has at the same time responded to teachers' initiative. This is confirmed by several teachers who claim that all actors who were interested in ICT and education were invited to express their opinions on the subject, and that they were very often taken into account in the decision making process. Looking at the composition of the Task Force ICT group, responsible for the ICT Task Force report, one can see that it includes people from the central management, from the IT staff and from the pedagogical staff. Some of the interviewed teachers expressed dissatisfaction about how the decisions had been taken "over their heads". This will always be a problem in complex higher education institutions slike BI. In this case, initiatives seem to have been taken on the basis of a combination of external factors, such as the Equis report, the Quality reform, general development in society and internal factors, such as motivation to improve pedagogical methods. Decisions appear to have been the result of a dynamic relationship between the administration and individual teachers with special interest in the use of technology in their teaching. Interviewees from both groups refer to longer periods of discussion, related to conflicting views on which LMS BI should usem and later how Blackboard should be implemented. One interviewee describes the conflict:

> *The pedagogical staff says they need to know how they should use the tool before they start using it, and the administration says they need hands on experience to be able to know how they can use it.*

The administration seems to be less involved in the practical implementation process. They played an important role in the first and the second phase of the innovation process, but the practical implementation was left to project leaders who function as motivators or "change agents" (Rogers, 1995) to promote Blackboard among the primary users. The teachers, to a great extent, have been given the freedom to implement Blackboard in their courses according to individual needs. There is no clear strategy and nothing like incentives or pressure to increase the adoption of Blackboard among the teachers. One interviewee formulated this situation as follows:

> *We see that we must let thousand flowers bloom many years to come. It must be based on the individual teachers' motivation.*

Summary on perceived profitability of Blackboard

Assumptions about Profitability:	**Teachers perceptions:**	**Administrators perception:**
AN LMS will improve the communication channels between teachers, and between teachers and students.	• Need for electronic communication channels. • Use mostly e-mail and web systems. • But Blackboard has simplified the distribution of information.	• Vision: Blackboard should create more efficient communication channels.
AN LMS will improve pedagogical methods and help teachers to become more innovative.	• Need to improve pedagogical methods and become more innovative. • Blackboard should be one of several ways to improve teaching methods • But how to use it – training ?	• Vision: Blackboard should create new learning models. • But first step: function as a publication tool for lecture notes and teaching materials. • A virtual learning arena, supporting face-to-face teaching.
AN LMS will help to create new business opportunities and therefore make the higher education institution more competitive.	• Not relevant	• Vision: The use of ICT will make BI more attractive and therefore more competitive.
AN LMS will make the educational delivery more cost-efficient.	• Time-efficient: less time copying and more time for qualitative preparations.	• Vision: Blackboard would mean more efficient distribution of lectures to more students at reduced costs.
General satisfaction of	• Good distribution tool.	• Too early

Blackboard	• Editing with Blackboard is heavy • Not a discussion tool.	

(table 6.1)

Using the four profitability assumptions as a starting point to evaluate to what degree teachers and administrators perceive Blackboard as profitable, interviews and document analysis reveal that teachers are not negative to Blackboard. Some of their expectations however need to be met by training, by further use or by activating some of the functions in the LMS. In the early stage where we interviewed the administration, they were positive about all four profitability assumptions. Whereas the administration seems to be more concerned about external factors such as the Equis report and external competition, the teachers are less concerned about economical issues and see Blackboard in relation to pedagogical use and as a communicational tool. They use it first and foremost as a distribution tool. As a communication tool, Blackboard could grow in importance. A lack of knowledge prevents the teachers from exploring the pedagogical possibilities within Blackboard any further. The question is however, whether training is enough to motivate teachers to change their pedagogical methods, or if other incentives are necessary, such as bonuses.

6.2.2 Perceived Compatibility

The assumptions about compatibility state that compatibility will be high if we find: 1) openness towards a more flexible organisation of teaching and learning; 2) a positive attitude towards the use of technology in education; 3) a positive attitude towards new innovative pedagogical methods; 4) openness towards change.

Teachers views on compatibility

- **Openness towards a more *flexible* organisation of teaching and learning**

When asked to what extent they felt a need for a more flexible organisation of teaching and learning processes at the teacher's institute or at BI in general, interviewees had different opinions. One claims that the organisation of teaching and learning is not flexible enough. He emphasised the lack of communication between teachers, and refered to the ongoing development of virtual "staff rooms" within Blackboard which could open up for a better

dialog between teachers. Presently, teachers keep their knowledge to themselves and are not willing to share with others. He explained this attitude:

> *One should work against the typical academia with individual competition and autonomy. Cooperation is important.*

Another interviewee claimed that the organisation is highly regulated and less flexible than other higher educational institutions. He however maintained that it is necessary to have that kind of control on a higher education institution like BI, with such a large and differentiated student group.

Two other interviewees claimed that they did not feel a need for a more flexible organisation. They argued that BI and their institutes have a sufficient level of flexibility. One of them claimed that BI has the most efficient system, in a Norwegian context.

Only one interviewee expressed a need for a more flexible organisation of teaching and learning. The others prefer to maintain the current organisation. As a partial conclusion, it seems that there is low degree of compatibility between the assumption about a positive attitude towards a more flexible organisation, and the teachers' actual perception of a need to make the organisation more flexible.

- **A positive attitude towards the use of technology in education**

All interviewees expressed a positive attitude towards using ICT in education. They have used ICT in some form in their teaching activities for many years.

Blackboard is an American e-learning tool, produced on the bases of given definitions and theories on how learning is promoted efficiently. One possible obstacle to compatibility can be that these 'metaphors' on effective learning can deviate from the teachers 'metaphors' of effective learning. The majority of the interviewees did not perceive this as a problem. One claimed:

It seems very good, if used as prescribed. I think it is very suitable for us. I have not started to use it a lot, but what I use makes sense.

The problems reported were related to the way Blackboard had been implemented and some weaknesses within Blackboard, like poor editorial function and difficulties when distributing the same course to several classes.

As a partial conclusion, there seems to be a high compatibility in terms of positive attitude towards the use of technology in general. However, the frustration related to the problems when the same course is distributed to several classes, indicates a weak compatibility between the course-distribution model at BI and the way Blackboard is organised. This factor could influence the total perception of compatibility.

- **A positive attitude towards new innovative pedagogical methods**

As indicated before, all interviewees were positive about trying out new and innovative teaching methods. One claimed that the most important thing for her is to adjust the courses to the time we live in. The Quality Reform is mentioned as one motivating factor that generates new innovative methods because of the need to be in head of the general development.

When elaborating if the interviewees saw the functionalities of Blackboard as relevant to achieve more innovative teaching, the responses varied. Most of the interviewees explicitly expressed that they perceived Blackboard as a relevant tool. They however had very different explanations to why they felt that it was relevant to them. These explanations were often associated with their own views on learning and/or their ambitions concerning their expectations to use Blackboard in their courses. One saw Blackboard as relevant because it facilitates more individualised teaching and learning. Another saw Blackboard as a relevant tool to become more innovative, but claimed that more training was needed to exploit the possibilities in Blackboard.

Two interviewees claimed that they perceived Blackboard as a relevant tool, but mostly for one-way communication with the students. They used it primarily to distribute lecture notes and give messages. To exploit the possibilities of two-ways communication, one of them

claimed that it would be necessary to use “champions” who could keep the discussion going and inspire the other users. The last interviewee was less clear concerning to what degree Blackboard was relevant as a tool to promote innovative teaching. He claimed that it should promote new learning arenas, but in reality these possibilities were not yet been employed. It was only used to distribute information to support traditional learning arenas in classrooms.

Most of interviewees claimed that they had not changed their teaching methods as a result of Blackboard. It was used, by most of them, to distribute information and lecture notes. When asked if the students reported improved quality of the lectures, three out of the five interviewees were not convinced that students perceived improvement of quality. One evaluated the students’ attitude like this:

> *Their perception of quality improvement is related to the new opportunity to retrieve lecture notes from the lectures they have not attended. I think they are positive to that. But apart from this, I don’t think they experience a radical change.*

Two interviewees claimed that they have changed their methods towards less classroom teaching and more activity on Blackboard. However, they experienced the student satisfaction very differently. One claimed that the students in general were more satisfied. The other experienced a very unsatisfied student group.

As a partial conclusion, it seems that interviewees are positive about the introduction of Blackboard as a relevant tool to explore new ways of teaching. However, as shown under profitability, there seems to be a gap between intentions and practice. Few interviewees have changed their methods by using Blackboard to make their teaching more innovative.

- **Openness towards change.**

A successful implementation of Blackboard will imply a certain degree of change in pedagogical methods among the teachers. The interviewees were therefore asked if they believed that there was a positive culture for change among the teachers at BI, or if staff in general hesitated to change their educational practice by implementing Blackboard.

The interviewees characterised the teachers at BI as divided in two opposed groups: one very positive to change, the other one very sceptical to change. One informant claimed that the general attitude among teachers at BI is extremely focused on means and goals. He claimed that if the teachers do not see an explicit value, they are not interested. He described the teachers as strong pedagogical professionals, who have a clear view on how the subject should be taught. One claimed that the attitude towards Blackboard was changing but that it took time to change. The interviewees emphasised some important factors that could make more teachers start using Blackboard. One factor was training and information about Blackboard. Another factor were to introduce incentives that could make it more profitable to expand the use of Blackboard. Some interviewees also claimed that a certain degree of pressure would be useful.

Administrators views on compatibility

- **Openness towards a more *flexible* organisation of teaching and learning**

The strategy plan for 2000-2003 does not focus explicitly on developing a flexible organisation of teaching and learning. However, creativity is emphasised as a basic value for BI.

> *We shall develop and recruit change oriented fellow workers. We shall stimulate to a continuing focus on the potential for development of our own work and functions. Innovation that promotes BI reputation, economical results and organisational cultur, shall be awarded. (Strategy plan 2000-2002)*

According to interviewees from the administration, BI depends on the market and this creates an innovative environment open for flexible and more efficient solutions if necessary. BI will move to Nydalen in 2005. Interviewees claimed that they will use this opportunity to rethink the organisation of BI to make it more flexible and efficient.

- **Positive attitude towards the use of ICT in education**

The BI strategy plan 2000-2002 specifies the clear ambition to become a leading actor in the use of ICT.

As indicated in the case description, BI has a long history of using technology in education. Interviewees from the administration claimed that since this has been a strategic focus for years, BI has invested in the development of an infrastructure. During the first interviews, both teachers and administration argued that more investment was needed. Some claimed that one could not offer any form of e-learning if the infrastructure was not in place. This last phase has been slow because these investments are very large. BI did solve the most critical factors before the implementation of Blackboard in fall 2002. If one sees the implementation of technology in a broad perspective, one can argue that BI's long history of strategic focus on technology makes the introduction of Blackboard compatible with BI's institutional norms, goals and values.

- **Positive attitude towards new innovative pedagogical methods**

The strategy plan for 2000-2002 does not explicitly emphasise on new innovative pedagogical methods. Nevertheless, as shown in the quotes from the strategy plan above, innovative activities seem to be an important value for BI.

Interviewees from the administration, emphasised that Blackboard should complement and not replace the traditional classroom. The policy documents do confirm this. this implies that the administration do not expect radical changes in the teaching methods. One interviewee argued:

> *Our ambition is not to become the best in using ICT, but the best in teaching. ICT is just a means to help us reach that goal*

- **Culture for change and promoting change**

As indicated above, BI has a clear strategy involving the promotion of an academic culture for change. They want to "*develop and recruit change oriented fellow workers" (Strategy plan 2000-2002).* The administration emphasised that this is a change process that had only just started. It will be long before the pedagogical staff changes its pedagogical practice. No clear strategies to promote change were reported by the interviewees from the administration.

One interviewee claimed that the training is not systematic enough.

> *We haven't defined if it should be optional or compulsory. If it is optional we should offer training, but if it is compulsory we must offer training*

There are different strategies at the different BI colleges. BI Oslo organised courses on the use of Blackboard for the pedagogical staff. This was primarily to give a general introduction to the system. How to organise pedagogical content was not a subject for the course. The "PåNett" project was aiming at training the pedagogical use of Blackboard. One project leader was responsible for the organisation of this training, which was conducted at all BI colleges.

Incentives were discussed as possible means to promote the adoption of Blackboard. The "ICT Task Force" report recommended to reward innovative use of the LMS and technology in general. At the time of the last interviews, March 2003, this was still not implemented.

Summary on the perception on compatibility

Assumptions about compatibility:	**Teachers perception:**	**Administrators perception:**
Openness towards a more flexible organisation of teaching and learning	• Not perceived as a necessity	• Market orientation: BI needs to be flexible and efficient
Positive attitude towards the use of technology in education.	• Positive attitude	• Positive attitude
Positive attitude towards new innovative pedagogical methods.	• Positive attitude • Have not changed their methods • Do not know how to change.	• Blackboard should complement, not replace traditional classroom teaching
Openness towards change / culture for change and promoting change	• Divided	• An important condition to promote creativity

(Table 6.2)

Although the teachers did not feel the need for a higher flexibility, it seems that the introduction of Blackboard shows high compatibility with the interviewees' positive attitude towards pedagogical innovations and the use of technology. We do note that the possibility of distributing the same information to several classes and publish across campuses, would increase the acceptance of the tool.

The administration's norms, values and goals are highly compatible with the introduction of Blackboard. All the expected implications of the introduction of Blackboard on the organisation and educational delivery are perceived as positive or neutral by the administration.

6.3 Case analysis of the college of Buskerud

6.3.1 Perceived Profitability

Teachers views on profitability

- **AN LMS will improve the communication channels between the teachers and the students, and among the teachers.**

When asked how they perceived the need for an LMS like Blackboard before it was implemented, four out of five interviewees expressed little felt need for an LMS as a communication channel. The fifth interviewee came to HiBu just when Blackboard was implemented and was not aware of the prior needs. One argues that the call for an LMS was based on individual needs, more than sectional or institutional needs. Another argues:

> *For me, it was not actually a need. I had made my own web page, and felt that it was sufficient. Maybe just as sufficient as Blackboard*

The only expressed need was to get one common communication channel towards the students to assure that all the students got access to relevant information. Two interviewees raised this view. It was described moreas an administrative advantage than a pressing lack of communication channels. Each department was described as small units with few students. Blackboard, as an information and communication channel in this context, was thus not indispensable.

When asked if Blackboard had an impact on the communication, the responses were either neutral or relatively positive. One interviewee emphasised the advantage of a common interface; before there were many different channels. However, the same interviewee added that in practice it had been very similar to the way communication was organised through their own web pages. Another interviewee argued that the communication had become more efficient, and that it had had an educational effect on the students. Since all messages were supposed to be available on Blackboard, none of the students could say that they had not got

the information. Yet another interviewee claimed that Blackboard makes it is easier to classify recipient through classes or groups of chosen students. The teachers were, according to him, becoming more conscious about the possibilities within Blackboard. He gave the following description of what he perceived to be the advantages of Blackboard:

> *Before, the alternative was to get external help to make classified address lists for classes or other groups, because we do not have our own experts. However, on Blackboard one can handle such groups, and even make new groups and concepts where it is possible to communicate with groups of students. My experience is that students feel it's ok to communicate via e-mail.*

Another interviewee claimed that the use of Blackboard had improved the contact between the students and her because of a more efficient way to distribute information and lecture notes.

In relation to the use of Blackboard as a communication channel between teachers, the interviewees were also divided. All had different views on the need for a more efficient communication channel, and how the implementation of Blackboard had effected this communication. Three saw a need to improve the communication; one of them however claimed that Blackboard had not funckioned in such a way. He explained that they had started a user forum, but that there were no contributions until then (March 2003). The second claimed that Blackboard had made the environment more transparent. It had made it easier to see what the others were doing. The third did not elaborate his view. The two other interviewees did not think there was a need to improve the communication between teachers. One of them did not elaborate his view. The other used the size and the organisation of the department at Hønefoss as an argument:

> *This is a small environment, and we got e-mail very early. Bulletin board and meetings served as sufficient communication channels. There has not been a need to improve the communication among the teachers*

There seem to be different views on how Blackboard facilitates better communication channels between teachers and students and among teachers. These differences reflect the individual teacher's needs for new communication channels. Blackboard was implemented in an environment where existing communication channels seem to have functioned sufficiently. One could however, say that Blackboard got a positive reception among the interviewees. None of them expressed negative experience or negative attitudes towards the tool. All the different experiences reported above, indicate that Blackboard has had a positive effect on communication. The interviewees do however not indicate any radical changes in the communication between the different actors at the institution.

- **AN LMS will improve pedagogical methods and help teachers to become more innovative.**

When asked to what extent they felt a need to improve their pedagogical methods and use more innovative teaching methods, the interviewees were divided. Three interviewees gave a positive response. Two were less concerned about changing their pedagogical methods. However, when asked if an LMS like Blackboard could help to improve the pedagogical methods, only one out of five saw Blackboard as a particularly useful tool for new and innovative teaching methods. The teacher, who had a positive attitude towards Blackboard, describes the pedagogical possibilities like this:

> *Blackboard is meant to improve the pedagogical methods. It is not really unique as a tool, but it gives a possibility to make very useful pedagogical materials available to the students. Through this tool one could reveal web sites relevant for their subject field. It is a giant step from when I was a student. From library and technical journals to the situation we have now with visual and interactive web sites with can be used in the education.*

The others doubted that their teaching methods could become more innovative through Blackboard. Their arguments varied and were associated with different aspects of the tool and environmental conditions. One was sceptical to how Blackboard could contribute to a more innovative pedagogy, and saw it as a communication tool rather than a pedagogical tool. This and another interviewee argued that there were other things than Blackboard that could

contribute to more creative teaching. They argued that it was just one out of many elements to improve teaching methods. A third interviewee argued that Blackboard was a forced administration of the education. He elaborated:

> *There are things which are more difficult in Blackboard and which make it inconvenient. The reason why we use Blackboard is because the students should have a common interface. I think that it is easier to use my own web. Here you get squeezed into one system.*

Yet another interviewee claimed that innovative pedagogical use of Blackboard is unsuitable for large student groups. They started to use Blackboard in the Informatics section at the department of Hønefoss in a period where they experienced a student boom. The normal student number was 7 to 10. In this period they had groups of 120 students. Under these circumstances Blackboard only served as an administrative tool, to distribute information. At the time of the interviews, the student number was going down. The interviewee claimed that this would make it possible to use Blackboard in a more innovative way.

To conclude; the majority of the interviewees did not agree totally with the assumption that the LMS Blackboard, would improve pedagogical methods and help teachers becoming more innovative. Except for one, they interviewees had a rather critical attitude regarding the benefit of Blackboard as a pedagogical tool, at least associated with innovative pedagogical methods.

A survey carried out by the “Learning on the web” group in 2001, can give an indication of how Blackboard is perceived as a functional tool to improve education. To the statement: My teaching has improved through the use of Blackboard, 36,7% totally or partly agreed. Only 16,9% disagreed. However, it is interesting to note that 46,7% were neutral. The report concluded that the high percentage of neutral respondents could be explained by the fact that Blackboard was relatively new and that the respondents did not have sufficient experience with the tool to measure the effects on their teaching. Based on the interviews conducted two years later, one could wonder if more experience has led to a higher percentage that would disagree on the former statement.

- **There is a need to become more competitive on the educational market. An LMS will help to create new business opportunities and thus make the higher education institution more competitive.**

Concerning BI, competitiveness and new business opportunities are associated with the focus on expanding the number of students by focusing on distance courses. Like BI, HiBu has a centre for distance learning: "Focus Ringerike". However, according to the interviewees, the centre does not seem to have the same importance, reputation or administration as the centre for distance learning at BI. One of the two interviewees from the department at Hønefoss had developed courses for distance learners. From Kongsberg, one out of three had experience with distance courses.

When asked how they evaluated the importance of distance students versus campus students, most of the interviewees hence based their arguments on either a general opinion about institutional needs or personal experience with emphasis on pragmatic priorities. In general they emphasised the importance of campus students over distance students. There was however some reflection around the necessity of the generation of new income to the institution through this new student group. Two of the interviewees were concerned about this issue. It was seen in relation to a general economical situation for higher education institutions, where state financing decreases. They concluded however that these distance courses have a more important role on visionary bases than in practice. They pointed to two possible explanations. One was related to an experienced difficulty to get a sufficient number of students to some of these courses. The other was a lack of necessary recourses from the administration to develop distance courses.

Based on the interviewees' statements, there seems to be an acceptance of the need of becoming more competitive on the educational market. It also seems to be acknowledged that Blackboard could serve as a useful tool to serve external students. However, the interviewees were little involved in the development of external courses, and showed very little interest for this student group. This can imply that a shift towards a greater focus on distance students could be challenging, at least within this group.

- **AN LMS will make the educational delivery more cost-efficient.**

To evaluate to what extent the interviewees perceive Blackboard as an effective tool to make educational delivery more cost-efficient, the interviewees were first asked if the reduction of costs was a relevant issue for them as teachers. Three of the interviewees claimed that this was not an important issue for them. Cost-efficiency was seen as the responsibility of the administration, not the teachers. The two others were less indifferent about the issue. Also These two also related it to an administrational responsibility, but they were willing to see their own role in this. One of them argued that the reduction of the state financing implied that everyone tries to become more rational in order to deliver an optimal education.

Concerning Blackboard's potential to make educational delivery more cost-efficient, only one interviewee agreed. Cost-efficiency is related to time saved on copying and reduction of paper costs for the institution. The other interviewees, who disagreed with the assumption, had a range of different arguments. One claimed that Blackboard actually is more time consuming because of new tasks, like increased use of e-mails and construction of discussion forums. Another interviewee argued that Blackboard as an LMS system is too expensive to allow a general cost reduction. A third interviewee claimed that the new media itself does not reduce costs: a redistribution of resources, with less emphasis on lectures and more on assignments, and individual supervision is necessary to obtain cost-efficiency. He however argued that a possible reorganization of educational delivery could just as well be an affect of general pedagogical trends as of Blackboard.

One can therefore conclude that few of the interviewees believed that an LMS like Blackboard could lead to a more cost-efficient educational delivery at HiBu.

- **General satisfaction of Blackboard**

None of the interviewees expressed explicit negative experiences with Blackboard. Only one expressed certain difficulties with the mail system. The interviewee preferd to use Lotus notes as mail system because Blackboard did not have documentation of former mail transactions. Apart from this element, which is not reported to be a problem by the other interviewees, there seemed to be a general satisfaction as to how Blackboard functions. The

interviewees claimed that Blackboard is a useful tool for the needed purposes, and satisfied their general needs.

Administrators views on profitability

The views of the administrators on profitability will be based, like the analysis of BI, on the interviews conducted in the first phase of this study, spring 2002, and official strategy documents. There were few persons from the administration who were willing to be interviewed. They argued that they were little involved in the implementation of ICT at the institution. The most important source will therefore be the strategic documents.

- **AN LMS will improve the communication channels between the teachers and the students, and among the teachers.**

The strategy documents do not reveal any explicit focus on a need to improve the communication channels at HiBu with Blackboard or any chosen LMS.

The interviewees did however focus on different aspects where Blackboard had an impact on the communication between the actors. One example was taken from the teacher education at Hønefoss, where the teachers at the ‘practice schools’ and the students at HiBu communicated via Blackboard and saved valuable time and travel. Another interviewee emphasised the communication between students as a positive effects of Blackboard.

- **AN LMS will improve pedagogical methods and help teachers to become more innovative.**

One important goal in the strategy plan 2001-2005 (Strategy 2001-2005) is to make HiBu an attractive college with high educational quality and flexible teaching methods. ICT tools should be used both professionally and pedagogically. In the background document for the strategy plan 2001-2005 the emphasis on ICT is argued to be a result of an increased pressure from the user groups to submit more flexible application models and ICT-based teaching methods.

The interviewees confirmed this strategic focus. They elaborated by pointing at some of the important challenges when Blackboard was to be used as a pedagogical tool. One interviewee claimed that the challenge lay in the transition from the use of Blackboard as a simple tool towards a more advanced use that can generate new methods for teaching and learning. According to him, the use of a tool like PowerPoint limits the teaching methods. It could mean a more traditional teaching than without this technology. Another interviewee argued that the Quality Reform was an important motivation for changing the learning methods and the evaluation methods. The administration gave economical support to stimulate increased use of Blackboard in order to change pedagogical methods. But until now, Blackboard is used more to administrate the teaching than as a pedagogical tool.

These two sources indicated that the administration at HiBu is concerned about the value of new pedagogical methods, and perceives an LMS like Blackboard as a profitable tool to improve the pedagogical delivery.

- **There is a need to become more competitive on the educational market. AN LMS will help to create new business opportunities and thus make the higher education institution more competitive.**

The strategy plan 2001-2005 does have a strong focus on competitiveness:

> *Competition for students and clients is hard. That is why innovative thinking and development is necessary in the years to come. This is what this strategy plan is about: New thinking – to be even better.*

The motivation behind the implementation of the LMS is formulated like this:

> *For the college to be attractive and competitive in the future educational market within higher education, one must focus on:*
>
> - *Pedagogical methods by using new forms of learning*
> - *E-learning through net-based forms of learning integrated in all subjects*

During the strategy period 2001-2005, HiBu wishes to increase the student number of fulltime students with about 25%. They also want to become a leading actor on the further education market. The implementation of new forms of flexible learning and teaching via the Internet will make the college better prepared for continuous growth (background document for the strategy plan 2001-2005).

The interviewees from the administration maintained this view. Competition is both national and international. Students are more and more becoming a pressure group with clear opinions about what they want, and what good and poor quality is.

- **AN LMS will make the educational delivery more cost-efficient.**

There is no explicit focus on cost-efficiency in the strategy documents. In the background document for the strategy plan, there is however a sentence mentioning the demand from the authorities for increased efficiency. This is not elaborated in the section were visions and main goals for the new strategy period is described.

None of the interviewees from the administration focused on cost-efficiency in relation to the use of ICT and Blackboard. It is thus difficult to say if the administration sees the use of an LMS as means to cost-efficiency.

Role of administrators and teachers in the innovation process

It is difficult to identify who played the most important role in the first phase of the innovation process, the indentification of a need for change. As mentioned earlier, central actors in the administration refused to be interviewed. They argued that they were not involved in the implementation of Blackboard. Some interviewees from the teachers however claimed, that the administration took the initiative to form the “Preparing for learning on the web” group. Others said that enthusiastic teachers took the initiative. The way the administration described its role in this process, together with remarks from the majority of the interviewees, indicates that the innovation process started mainly as a bottom-up process in which some enthusiastic teachers took the initiative, and the administration supported by developing strategies. The planning process, the identification of the second phase in the

innovation process, was initiated by the creation of the “Preparing for learning on the web” group. The group consisted of teachers interested in IT from all three departments, and one representative from the library. The next step or phase in the innovation process was the “Learning on the web” group that administrated the implementation of the plan. The administration channelled strategic funding to finance the “Learning on the Web” group and other necessary actions.

The implementation of Blackboard seems to be driven by the teachers through the “Preparing for learning on the web” group and later through the “Learning on the Web” group. However, to get a more nuanced picture of the teacher group’s influence, it is important to notice that the selection of teachers to these groups were based in special interest in IT and e-learning. Among the other teachers, there seems to be a certain resistance to implement Blackboard.

Summary on the perceived profitability of Blackboard

Assumptions about Profitability:	**Teachers perceptions:**	**Administrators perception:**
AN LMS will improve the communication channels among teachers, and between teachers and students.	• Little or individualistic need for a new communication channel prior to implementation. • Some need for one common communication channel towards students. • Positive but diverse views on the impact of Blackboard on communication. • No radical changes in the communication.	• No focus on this issue in the strategy documents. • Interviewees reported some positive impact.
AN LMS will improve pedagogical methods and help teachers to become more innovative.	• Divided view on the need to improve pedagogical methods. • Critical attitudes towards the benefits of Blackboard as pedagogical tool. One of several ways to improve teaching methods. • What is pedagogical use?	• Strategic focus on ICT as a means to change pedagogical methods. • Interviewees observed that Blackboard is used as a pedagogical tool only to a little degree.

AN LMS will help to create new business opportunities and thus make the higher education institution more competitive.	• Certain acceptance for the need to generate more resources at the institutional level. • Few were involved in creating distance courses • Little interest in distance student.	• Strong focus on competitiveness in strategy documents. • A motive behind the implementation of Blackboard
AN LMS will make the educational delivery more cost-efficient.	• Few related cost-efficiency to the use of Blackboard	• No focus in the strategy plan or by the interviewees
General satisfaction of Blackboard	• Positive experiences	• Not elaborated

(Table 6.3)

Using the four profitability assumptions to analyse the teachers and administrations' perception of Blackboard, we can see that the two groups are divided in their view on how and where Blackboard could be profitable. The main difference is associated with Blackboard as a pedagogical tool, and Blackboard as a tool to help the college to become more competitive on the educational market by creating new business opportunities. In the first case the teachers were critical to the unique benefit of Blackboard as a pedagogical tool. They saw it as one of many useful tools. For the administration it is a strategic focus to make HiBu more attractive by offering new pedagogical methods. The use of an LMS like Blackboard is coupled with e-learning integrated in all subjects. The administration seems to be aware of a lack of pedagogical use among the teachers. However, no strategies on how to encourage more pedagogical use of Blackboard were revealed during the interviews or in the strategic documents. Methods, like incentives or other forms of motivations, were not mentioned. Increased competition was another important motive for the administration. The teachers showed lower interest for this issue.

In spite of their different views, the general impression is that the teachers and the administration see Blackboard as a profitable tool. If the information from the interviewees was representative for the whole teacher group, one can claim that the visionary view of the administration can be challenged by the more sceptical view of the teachers. It is however

difficult to indicate how this will develop, even within the small group of interviewees, because the teachers were highly diversified in their view on how profitable Blackboard was. The interviewees were taken from different professions and different departments. An interesting question could be if these differences are related more to different professional and institutional needs than to individual needs. One interviewee claimed that his colleagues, teaching the same subject, used Blackboard in a very homogenous way. This could indicate that there are similarities between needs and actual use clustered around individual subjects or institutes.

6.3.2 Perceived Compatibility

Teachers views on compatibility

- **Openness towards a more *flexible* organisation of teaching and learning**

When asked to what degree the teachers felt a need for a more flexible organisation of teaching and learning at their institute, most of the interviewees were negative. Their arguments were different. One interviewee simply did not feel a need to change. Two other teachers felt restricted by the physical infrastructure. Teaching in classrooms or auditoriums set the limits for the flexibility, one teacher claimed. Yet another interviewee argued that there had never been a discussion that revealed a need to change. The implementation of Blackboard had nothing to do with a need to change the organisation. A common attitude among four of the five interviewees was that HiBu already had a flexible organisation of teaching and learning prior to the implementation of Blackboard. It was actually perceived as a challenge to keep this flexible organisation when using Blackboard. One describes the situation at the department of Hønefoss:

> *We have greater flexibility within the organisation than what is possible to build into Blackboard. We teach across subjects. Here there are no institutes and a loose sectional structure. All is subject oriented. It is a challenge to find an application form in Blackboard that suits this structure. Blackboard is more rigid than the department.*

Just one interviewee claimed a need for a more flexible organisation, using two arguments to support his view. First, it is important to seek new possibilities for better pedagogical models. Secondly, it is necessary to offer an education that is relevant for the students who grow up with SMS and chat on the Internet. He argues:

> *They come here with this culture, and if we use chalk and blackboard and show no will to meet them at their level, it is a bad sign.*

As a partial conclusion, there seems to be little compatibility between the norms, goals and values of the teachers interviewed and the assumption that an LMS will lead to a more flexible organisation of teaching and learning. It is however interesting to note that the teachers actually challenge the assumption that an LMS is closely connected to flexible delivery of education (Collis & Moonen, 2001). The teachers claimed that the organisation had a flexibility that Blackboard could not embrace. The organisation would become more rigid if Blackboard was to dictate the organisation of teaching and learning. One could therefore argue that the teachers' view is compatible with openness towards a flexible organisation of teaching and learning. But in this case Blackboard is not seen as compatible with this flexible organisation.

- **Positive attitude towards the use of technology in education**

All interviewees are positive to the use of ICT in education. They had used some form of technology in their teaching also before Blackboard was implemented at the institution. They had different arguments for why they used technology in their teaching and which level of use that is effective. Two taught IT related subject and wanted to use what they taught. The three others, who were not directly connected to IT, were more reluctant to the intensity of use. One teacher argued that it is important to take small steps and not implement the technological solutions into all subjects at oonce. That could lead to too much focus on the software solutions and less focus on the content of the lesson. Another teacher argued that it is important to consider how one uses it. He elaborated:

> *It is easy to be caught in a trap. To think that an e-mail tool with access to the whole class will assure a collective comprehension of a message is a misunderstanding. There are no guarantees that it will work. It will only happen if it is used the right way. You need a formulation and communication style that works. That is a huge challenge.*

The organisation of the functionalities within Blackboard is based on underlying theories and definitions on how effective learning and teaching is promoted. This is defined as the learning "metaphors" in Blackboard. When asked to what degree they found these metaphors relevant in their teaching, the majority of the interviewees were either positive or neutral. Only one reported a certain degree of dissatisfaction. He argued that the given frame is very "Americanised".

To conclude, there seems to be a positive environment for the use of technology at HiBu. Except for one critical voice, the way Blackboard is organised seems to be relevant for the teachers. However, as one teacher pointed out, she only used about 30% of the functionalities. It is thus possible that the teachers choose the functionalities that are relevant to them, avoiding those that would create problems.

- **Positive attitude towards new innovative pedagogical methods**

As discussed under the profitability assumptions, the teacher group had different opinions about the use of new and innovative pedagogical methods. One teacher argued that one might become more innovative by using e-learning methods, but that the most primitive forms, like e-mail, are the most efficient. Discussion rooms sound interesting but are useless in practice among campus students. This extreme view was to a certain extent supported by the majority, who rejected that Blackboard could contribute to more innovative methods.

When asked to what extent they see the different functionalities within Blackboard as relevant to them as teachers, they were again divided. Two teachers considered the functionalities as highly relevant. The three others claimed that the functionalities they had chosen to use were relevant. The rest, like for instance synchronous communication as chat, or

asynchronous communication for discussion forums, were perceived as less relevant. One described his experiences:

> *What I make available of information and tips to the students, they use. They use Blackboard to a very little extent to give us reactions through the discussion forum. Then they come to see us. That is ok for us. We don't want to pressure our students to use it.*

When asked if they had changed parts of their teaching methods after they started to use Blackboard to support their teaching, few changes were reported. An interviewee gave a description that seems to be relevant for most of the interviewees:

> *Yes, it has had an impact on how the assignments are evaluated and discussed. But beside this, there has not really been any change.*

One teacher claimed that it has made it easier to make interesting pedagogical material available to the students. However it is difficult to claim that this possibility is unique for Blackboard. Those who used their own website earlier argued that they used Blackboard in the same way as they used their website. The change in teaching methods is therefore not directly related to Blackboard, but came before Blackboard was implemented for those who used web solutions.

Only one interviewee argued that the quality of the teaching had improved as a consequence of Blackboard. The others saw this as an irrelevant question since Blackboard was used more to distribute information than as a pedagogical tool.

To sum up, the group of interviewees had both positive and negative attitudes in terms of new pedagogical possibilities. Jaffee (1998) claimed that the use of ICT could facilitate new and better pedagogical methods. Seeing this in relation to the responses about pedagogical effects of the use of Blackboard, Jaffee's statement does not seem to fit with the teacher's attitude towards Blackboard. However, several interviewees claimed that the use of ICT, like e-mail, the Internet and self-created websites, to some degree changed their pedagogical methods. One could therefore argue thatthere among some teachers is a positive attitude

towards new innovative pedagogical methods. But this is associated rather to the use of ICT, not necessarily to the use of an LMS like Blackboard.

- **Openness towards change.**

Because of the underlying assumption that the implementation of an LMS tool like Blackboard will imply a change in educational delivery, it was interesting to discover to what extent there was a positive culture for change among the teachers at HiBu.

The teachers at HiBu are described as divided. Some are more open tochange than others. The division is related to age; the older teachers are perceived as more conservative than the younger. One teacher claimed that people in general are quite conservative and he argued:

> *They must have good reasons to change. We like to say that we are progressive, but to be honest we are not.*

The training in the use of Blackboard seems to be sufficient. The interviewees were satisfied with the user support.

The interviewees claimed that the most important factor that motivated teachers to start using Blackboard in the initial phase of the implementation process, was the enthusiasm of the key initiators who "sold" Blackboard in informal talks, and other colleagues. The administration did not participate in this process. The challenge, according to an interviewee, was to make the "break pads" among the teachers, who made it difficult to advance further, and to change their attitude.

Administrators views on compatibility

- **Openness towards a more *flexible* organisation of teaching and learning**

One of the main goals in the strategy plan 2001-2005 is to develop flexibility and change orientation. The priority in the strategy period, which corresponds to this goal, is formulated in the background document for the strategy plan:

> *The college shall offer development- and change oriented workplaces where distribution of intern resources should be based to a greater extent on obtained results. This will imply a creation of an organisational culture and attitudes which see demands for change as an opportunity and challenge, and which motivate new thinking, personal contribution and flexibility.*
> (Background document for strategy plan 2001-2005, p.6)

Here the promotion of a more flexible organisation is not explicitly associated to the use of ICT.

According to the interviewees from the administration, the implementation of the Quality Reform required radical changes in the organisation of teaching and learning. It required a more flexible organisation with new forms of teaching and new forms of evaluation.

One could thus conclude that the administration sees the development towards a more flexible organisation of teaching and learning as crucial for the future expansion of HiBu.

- **Positive attitude towards the use of ICT in education**

Again there are clear indications in the strategy documents that the implementation and use of ICT in education is an important area of commitment for the administration at HiBu. This has been thoroughly elaborated in the profitability assumptions.

- **Positive attitude towards new innovative pedagogical methods**

As shown earlier through several quotes, there is a strong and positive focus on the use of new pedagogical methods with ICT.

- **Culture for change and promoting change**

The quote from the background document for the strategy plan 2001-2005, used earlier to illustrate the positive attitude towards a flexible organisation, is also valid as a demonstration of a will to change and to promote change as a strategic area of commitment. It is interesting to note that one way to promote change among the pedagogical staff is to distribute resources

based on obtained results. An interesting question will be how to measure obtained results. Will the results be based on production of courses, student's results or individual research? This is not elaborated further in the document.

Summary on the perceived compatibility of Blackboard

Assumptions about compatibility:	**Teachers perception:**	**Administrators perception:**
Openness towards a more flexible organisation of teaching and learning	• General satisfaction of the existing organisation. • Blackboard could not support this flexible organisation.	• Crucial for the future expansion of HiBu.
Positive attitude towards the use of technology in education.	• Positive environment for the use of ICT. • Teachers choose the aspects of Blackboard that are relevant to them.	• Positive attitude.
Positive attitude towards new innovative pedagogical methods.	• Divided. • More positive to ICT in general than an LMS like Blackboard	• Positive attitude.
Openness towards change / culture forchange and promoting change	• Divided. • Change agents were important to promote change.	• Encouraging change through result orientation.

(Table 6.4)

7. Discussing the findings

The main objective of this chapter will be to discuss, based on the empirical material from the two cases, whether Blackboard will be institutionalised in the two institutions. It will be estimated whether the teachers' and the administrators' perception of profitability and compatibility at both institutions is high, medium or low. These findings will be integrated in Van der Wende's model (figure 2.1) to illustrate the possible outcome of the innovation process in the two institutions. The last section of this chapter will consist of a critical discussion of the validity of these findings. To what extent are the assumptions of profitability and compatibility, as formulated in this study, relevant for the institutional context, and to what extent do these concepts sufficiently explain the innovation process in the two institutions? Finally, it will be discussed how Blackboard facilitates innovative teaching at the two institutions.

7.1 Evaluating profitability and compatibility in the two institutions

7.1.1 BI

Perceived profitability

The teachers perceived Blackboard as partially profitable. It has simplified the distribution of information for some teachers. Others acknowledged that Blackboard could make teachingmore innovative. However, this is based on their expectations, as they have had little experience with Blackboard. Few had tried to change their teaching methods by using Blackboard. Interviewees were not concerned about the cost-efficiency aspect of Blackboard. Although they claim that the time they save on copying handouts to the students is used on course preparation. Blackboard is perceived as profitable because it is a simple, standardised tool for distributing information, lecture notes and web materials for classroom-based lectures.

The administration seems to have had high expectations about profitability related to all four assumptions. However, they were careful not to expect too many changes at once. At the beginning, Blackboard was to function mainly as a publication solution. It was not to replace classroom teaching, only to support it.

The administration was dominant in the initial stages of the innovation process, and thus defined to a great extent how Blackboard was to be implemented. The implementation of Blackboard at BI has thus mainly been a top-down process, initiated by the administration and involving teachers with a special interest in ICT in the second phase of the innovation process.

To set a common aggregated mark on the perception of profitability by the teachers and the administrators is difficult and probably inaccurate. While the administration's perception of Blackboard is based on strategic visions and secondary experience, the teachers have hands on experience with the use of Blackboard as a support system for their teaching activities. Their view should thus be prioritised. One could assume that the administration, which initiated the innovation process, would try hard to influence the teachers through strategies encouraging the implementation of Blackboard. However, there are indications that the administration is pulling out of the implementation process, and lacks a clear strategy to stimulate the adoption of Blackboard. This weakens their influence. Consequently, the teachers' perception of Blackboard is emphasised over the administration's perception. The overall perception of profitability at BI is thus given medium high value (see figure 7.1).

Perceived compatibility

The compatibility between norms, values and goals associated with Blackboard and those associated with the teachers, could be relatively high if the teachers perceive Blackboard to be profitable for their teaching. The teachers expressed a positive attitude towards the use of technology in education and the use of new innovative pedagogical methods. They were, however, less concerned about the necessity to develop a more flexible organisation of teaching and learning. Their attitude towards change seems to be conditioned by their perception of to what extent the innovation adds value to their teaching.

The administration's norms, values and goals are highly compatibility with those of Blackboard. They express a need for a flexible and efficient organisation. They have very ambitious goals for the use of ICT in education. They are positive with respect to the use of new innovative pedagogical methods, but do not expect a shift from campus teaching to virtual teaching. They also focus on developing an academic culture for change, but lack concrete strategies on how to promote change.

To set a common aggregated mark for the compatibility between Blackboard and the institutional norms, values and goals at BI, it is important to determine which of the two groups, teachers or administration, has the largest influence on the institutional norms, values and goals. In a theoretical perspective, teachers' norms, values and goals are reflected by their autonomous position (Clark, 1984). However, the teachers are members of a social institutional context, assumed to influence the professional values and beliefs held by individual academics (Maassen, 1996). The administration of the institution may influence the norms, values and goals of the teachers. The administration could exploit the teachers' attitude towards change, refered above, and persuade the teachers into implementing Blackboard by using pedagogical or economical incentives, such as more training or economic advantages. However, the administration at BI does not seem to grasp this opportunity. Consequently, the teachers' perception of compatibility will influence the institutionalisation of Blackboard to a greater extent than the administration's perception. Because of the teachers' conditioned attitude towards change, one could argue that the compatibility will be high if the teachers have positive experiences with Blackboard (see figure 7.1).

7.1.2 The college of Buskerud

Perceived profitability

The perception of the profitability of Blackboard among the interviewees is relatively low. Few felt a need for the LMS tool prior to the implementation, neither as a communication tool nor as a pedagogical tool. The impact on communication and pedagogical methods were reported to be rather poor. The only advantage with Blackboard as a communication tool is to have one common channel for communication with students. The pedagogical use of

Blackboard is questioned. There are few ideas about how Blackboard can be used to support new and innovative pedagogical methods. The teachers recognised that Blackboard can be profitable for the development of distance courses, but they are too little involved in distance learning and show limited personal interest in it. Blackboard was not seen as a cost-efficient tool. Paradoxically however, the teachers report a general satisfaction about Blackboard. They report of positive experiences with Blackboard and have to a large extent implemented Blackboard in their courses. This paradox will be discussed in the next section.

The administration perceived Blackboard as a very profitable tool. They were particularly positive about the expected pedagogical assets of Blackboard and the potential to use it in distance courses. But the administration was only to a limited extent involved in the implementation process of Blackboard. The strategy documents encourage the use of ICT, but the teachers claimed that they did not read the strategy. The implementation of Blackboard at HiBu seems therefore to be a bottom-up process with the teachers as the driving force. The teachers' perceptions are thus given greater value than the administration's perception. The perceived profitability of Blackboard at HiBu is hence given a relatively low value (see figure 7.1).

Perceived compatibility

The compatibility between norms, values and goals associated with Blackboard and those of the teachers at HiBu is difficult to assess. In general, there seems to be a positive environment for the use of technology in teaching activities. The teachers chose the functionalities of Blackboard they perceived as relevant for their existing teaching methods. There is little interest to explore a new and innovative teaching method through Blackboard. Many claimed that the existing organisation of teaching and learning is sufficiently flexible. Blackboard was not perceived to be compatible with this flexible organisation because of its difficulty to manage interdisciplinary courses. In general, the teachers seemed to be divided in their openness towards change.

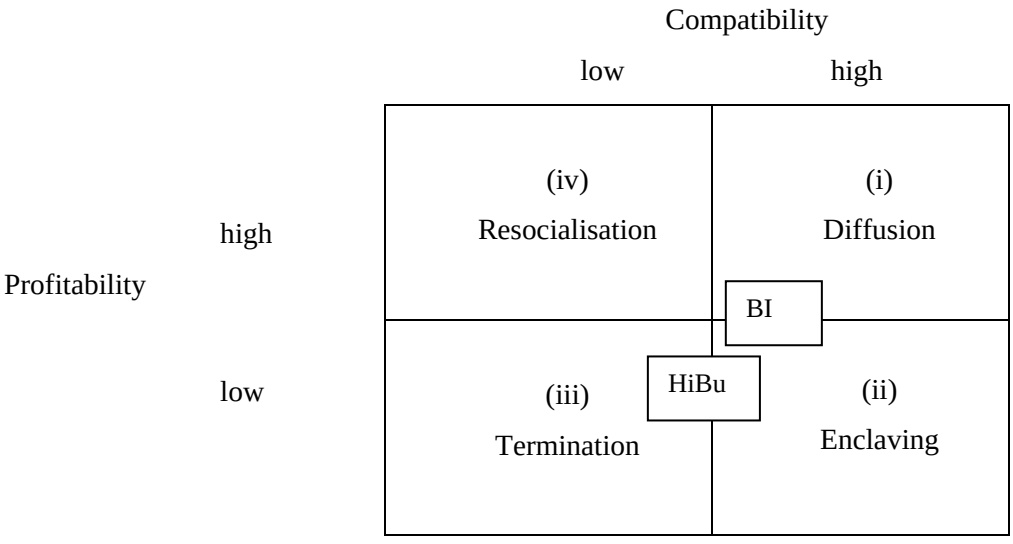
The administration's values and goals seem to be much more compatible with those of Blackboard. They emphasised the use of technology in education and new learning forms in the strategic goals. They also saw a flexible organisation of teaching and learning as crucial

for the future expansion of HiBu, and they encouraged change by rewarding good results. It is important to note that this is a strategic focus. How the administration plans to implement these strategies is not shown in the data material gathered in this study. The administration supported the implementation of an LMS, but the responsibility for the implementation was given to the "Learning on the Web" group. If the teachers did not read the strategies, it is difficult to see how the visions of the administration impacted on the norms, values and goals of the teachers. The teachers' perception of compatibility is thus, again, emphasised. The institutional perception of compatibility is given medium value (see figure 7.1).

7.2 Tentative conclusions about the outcome of the innovation process

When integrating these findings in Van der Wende's model, the outcome of the innovation process at both BI and HiBu can go towards enclaving of the innovation. In the case of HiBu it balances between enclaving and termination. Blackboard seems to have a better future at BI. Here innovation balances between enclaving and diffusion (figure 7.1).

Figure 7.1: Possible outcome of the innovation process at BI and HiBu.



One possible interpretation of this finding is that the innovative use of Blackboard at BI will either spread within certain groups or environments or throughout the institution. At HiBu innovative use of Blackboard will interest only a few, and will thus be reserved for particular groups or situations.

In the last section of chapter 5, some of the main institutional differences are described. These differences may, to some extent, explain the different perception of Blackboard at the two institutions. Higher perception of compatibility at BI may be based on the experience with the use of the LMS Apollon. However, it is uncertain if this experience has influenced the institution as a whole. Apollon was developed for the centre for distance education, not for campus-based teaching, the unit of analysis in this study. Another possible explanation of the difference in the perception of compatibility is the different funding situation at the two institutions. The administration at BI communicates a need for dynamic and efficient forms of teaching and a need to use teaching methods which attract students, or clients, as the students are called at BI. Even though the administration is only to a limited extent involved in the implementation of Blackboard, the more general emphasis on flexibility and efficiency may affect the teachers' attitude towards change and new pedagogical methods positively.

In relation to the differences in the perception of profitability, the different size of the two institutions and the course-distributed model at BI may lead to a higher perception of profitability of Blackboard at BI than at HiBu. Blackboard may be perceived as more profitable when the student body is more important, and when standardised courses are distributed to the 23 colleges, as is the case within BI.

However, when these institutional differences are taken into consideration, the actual difference shown in figure 7.1 is surprisingly small. The process of institutionalising Blackboard at the two institutions may thus be influenced by other, more internal processes. This will be discussed later in this chapter.

Methodological limitations of this study, discussed in chapter 1, page 10-11, may have affected the findings. The sample chosen may not be representative of the general teacher group at the two institutions. A fruitful approach to avoiding this problem may be to conduct a survey where all the teachers at the institutions could be included.

7.3 Critical discussion

Figure 7.1 indicates that Blackboard has a higher probability of diffusing at BI than at HiBu. However, the empirical study shows a general higher satisfaction of Blackboard at HiBu than at BI. In addition, the survey conducted at HiBu in 2001 indicates that the majority of those who had started to use Blackboard would continue to use it (72,4%). Of those who did not use it at the time, 46,4% would like to start using it. Both observations seem quite paradoxical, and need further investigation.

7.3.1 Relevance of the profitability and compatibility assumptions

There is an inconsistency at HiBu between relatively high satisfaction and the lower scores on profitability of Blackboard. It may be related to the weakness of the study's assumptions about profitability and compatibility. The assumptions were constructed based on theoretical views concerning the impact of ICT in higher education. These assumptions may be false or simply perceived to be of little relevance to users of Blackboard. If that is the case, the analysis gives a wrong picture of the diffusion of Blackboard in the two institutions. At this stage it will be useful to review the assumptions.

Concerning the assumptions about the profitability of Blackboard as a communication and pedagogical tool, there seemed to be no common perception among the teachers as to how and why Blackboard could improve educational delivery. At HiBu, the interviewees used Blackboard only to a low degree as a communication tool in the sense of two-way communication. At BI, Blackboard was only to a limieted extent used as a communication tool by the interviewees. They prefered e-mail to communicate. The value of Blackboard as a pedagogical tool has been discussed in both institutions. At BI, despite a motivation to use more innovative pedagogical methods, they are uncertain as to how Blackboard can lead to more innovative pedagogy. At HiBu they were critical from the start about the pedagogical benefits of Blackboard. They actually asked: what is pedagogical use? The challenge would therefore be to reach a common understanding of the benefits of pedagogical and communication use.

Therefore, at the time of the interviews, the teachers do not seem to be conserned about the profitability of Blackboard as a communication and a pedagogical tool as has been formulated in the assumptions.

The teachers at both institutions rejected the economic profitability of Blackboard. This was seen as an issue only for the administration.

Blackboard is perceived as more suitable for organisational purposes by the interviewees. Their satisfaction with Blackboard is associated with organising courses and distributing information and relevant educational support materials.

Considering this discussion, an interesting experiment would be to adapt the assumptions of profitability and compatibility from a theoretical, visionary base to a practical experience base. In that case the alternative assumptions about profitability would be:

- An LMS will make the distribution of information and course material more efficient.
- An LMS will be useful as support for classroom teaching.

The alternative compatibility assumptions focus less on an academic culture open for change, pedagogical innovation and organisational flexibility. A suggestion is:

- Positive attitude towards the use of technology in the educational delivery.
- Positive attitude towards new structures for distribution of information.

If these assumptions of profitability and compatibility were used in this study, the likely results would be a higher degree of diffusion at both institutions.

The theoretical framework of this thesis has been useful to expose the factors that influence the innovation processe at BI and HiBu. The conclusions that some of the assumptions deviate from the teachers views of Blackboard should be interesting for further research in this field.

7.3.2 Discussing the concepts profitability and compatibility

The contrast at HiBu between the perception of Blackboard as moderately profitable and moderately compatible, and reports of general high satisfaction of Blackboard, can also indicate that the perception of profitability and compatibility do not sufficiently explain the innovation process at BI and at HiBu. An innovation may be institutionalised even though it is not seen as highly profitable and compatible. Zucker (1987) and her definitions of the institutionalisation processes may be a useful supplement to understand the innovation process taking place at both BI and HiBu. Zucker points to to two different theoretical approaches explaining the institutionalisation process. One, 'environment as institution' described in chapter 2, explains how normative pressure influences the institutionalisation process. This pressure could be external or arise from within the organisation. A basic assumption is that institutionalisation is based on reproduction or copying of system wide social facts on the organisational level (Zucker 1987). At BI and HiBu it is possible to identify both external and internal pressure to implement Blackboard. The teachers and the administration claimed that students expect extended use of ICT in their courses. The use of ICT tools like LMS was claimed to be part of a natural modernisation of teaching corresponding to students' normal communication patterns. If there is such an expectation among the young people planning their secondary education, this can represent an external pressure, because of the need to attract new students. However, it becomes internal normative pressure when the different actors within the institution use this argument. An interesting observation from the study is that the students in many cases dislike extended use of ICT in their courses. Some complain if the teachers use less traditional face-to-face courses and more online communication in Blackboard. The pressure to modernise and adapt to students expectations seems to be based on myths more than on reality.

Another example of internal normative pressure may occur when some teachers at BI argued that they implemented Blackboard because it is an institutional strategy. To what extent they perceived Blackboard as profitable and compatible was irrelevant to their decision to implement Blackboard in the most basic form. This perception became important only to expand their use of Blackboard. Implementing Blackboard in the most basic form was thus driven by loyalty to the institutional policy. At HiBu the interviewees were less concerned about the institutional policy to implement Blackboard, but concerned more about internal

normative pressure from colleagues. Most teachers who had implemented Blackboard pushed the others to do the same. The general aim was that all teachers should use Blackboard in their courses.

Because of these observations, one may claim that the institutionalisation of Blackboard is affected both by the perception of compatibility and profitability, and by the perception of external and internal normative pressure.

7.3.3 Does the introduction of Blackboard lead to innovation in the teaching activities?

The overall research question for this thesis is: How does the introduction of the learning management system Blackboard in two Norwegian higher education institutions lead to persistent innovation in an institution's delivery of its teaching activities?

Based on the empirical material, a relevant question will be: to what degree can the current use of Blackboard be defined as innovative? Roger (1995) argues that the idea, practise or object, must be perceived as new by the unit of adoption. One can ask if a transition from paper distribution and oral messages to information distribution through Blackboard and e-mail is a real innovation or only a new package for an old activity.

Does the introduction of Blackboard, assumed to be profitable as an organisational tool, provide not only different ways to organise and administrate teaching, but also a qualitatively new organisational approach? The interviewees seem to agree that this new technological tool is used within a traditional frame, illustrated by the list of functionalities in use:

- distribution of information and timetables,
- distribution of assignments and solutions,
- distribution of lecture notes,
- web links,
- e-mail

Bates (2001) supports this by arguing that the common use of technology does not replace either the teacher or the classroom. Using technology to supplement classroom teaching does not radically change teaching methods. It merely enhances what would be done in the classroom in any case.

Some interviewees, however, are exploring the possibilities of discussion forums and databases of web links that are intensively used to enrich the existing teaching material. Cuban's (1988) distinction between first- and second-order changes can be a useful tool to describe this phenomenon. The majority of the interviewees used Blackboard in accordance with first order change. They used it as a means to make the existing teaching methods more efficient and effective without disturbing the basic organisation of teaching and learning. Those experimenting with discussion forums and databases of web links were exploring a second-order change, if they sought to alter the traditional forms of teaching (ibid).

It will be interesting to observe which direction the use of LMS will go. Will it stay a first-order change, with limited innovative elements for teaching and learning? Or will it develop into a second-order change, where teachers use fundamental new teaching methods? From the theoretical perspective of first- and second-order change, Cuban (1988) argues that the transition from first-order to second-order change arises from dissatisfaction with the existing traditional methods. If this is the case, how will this eventual dissatisfaction grow? Will it grow from best practice experiences through other colleagues, or from pressure groups like students who expect more "virtual activities" freeing them from constraints of time and place? However, a transition from first- order to second-order change at higher education institutions in general, can be delayed. According to Castells (1996), higher education institutions will continue to be associated with face-to-face education for a long time. They are the least affected by the virtual logic embedded in information technology.

At this stage, it is difficult to predict how this innovation process will develop at BI and HiBu. Blackboard is a rather new tool at both institutions. HiBu introduced Blackboard spring term 2000, BI fall term 2002. The interviewees from both institutions reported that many teachers had not yet implemented Blackboard. As Fullan (1991) argues, change is a process, not an event, and it takes time. He claims that the total timeframe from initiation to institutionalisation is three to five years, even for moderately complex changes. Major restructuring efforts can take five to ten years. The different actors involved in an innovation

process will have different starting points and different attitudes towards an innovation. According to Roger (1995), there are five adopter categories: 1. innovators; 2. early adopters; 3. early majority; 4. late majority; 5. laggers. It seems that at both institutions, the interviewees are mostly within the second: early adopters, or third category: early majority. The interviewees reported that many teachers at the institutions had still not adopted at all. This ranking refers to the minimal organisational functionalities listed above. Only a few innovators used Blackboard within a more innovative pedagogical frame.

The actual outcome of the innovation process is difficult to predict at this stage. However, the tempo of the technological development the last years, and its focus on the educational market, indicate that the development and use of ICT in education is an irreversible process. The question is not if it will be used but how it will be used. Blackboard, in its current form, is not necessarily an optimal ICT solution for a higher education institution. One possible outcome of the innovation process directly connected to the use of Blackboard can thus be termination. BI or HiBu can decide to stop using Blackboard as their LMS tool. However, it is difficult to imagine that they would not use ICT to support educational delivery.

8. Summary and concluding comments

This case study aimed at investigating how the introduction of the learning management system Blackboard may lead to persistent innovation in the educational delivery in two selected higher education institutions: BI and the college of Buskerud (HiBu). To approach this research question, the introduction of Blackboard is seen as an innovation process, going through different stages. The process starts when actors within the institutions identify a need for change. It ends when the institution institutionalises, resocialises, enclaves or terminates the innovation. This process will take several years. The two dimensions profitability and compatibility are estimated to determine the last stage of the innovation process (Levine, 1980). These two concepts are used as tools to measure the expected outcome of the innovation process at the two higher education institutions. The operationalisation of these two concepts is built on the assumptions found in the literature about ICT and network technology like LMS, presented in chapter 3. Characteristics of LMS tools assumed to affect the norms, values and goals held by the actors involved, like facilitating more flexible organisations and new pedagogical methods, are transformed into assumptions about compatibility. Assumptions about how the functionalities of an LMS are perceived as positive for the users, like communication that is more efficient, better pedagogical methods and cost-efficiency, are transformed into assumptions about profitability. Actors from the two higher education institutions were interviewed about their perception of profitability and compatibility related to these assumptions.

Interviews and the document analysis revealed that the interviewed teachers and administrators from both institutions seemed to be divided in their perceptions of profitability. The administrators held more visionary views on the impact of Blackboard in education. The teachers were more reluctant to the profitability of Blackboard. The teachers at BI were slightly more positive than the teachers at HiBu. At both institutions, they seemed to perceive Blackboard more as a communication tool than a pedagogical tool. Profitability related to cost-efficiency and competition was of little concern to the teachers.

The teachers and administrators are also divided in their perception of the compatibility of Blackboard. The administrators' arguments are compatible with Blackboard. They emphasised the importance of a flexible organisation of teaching and learning, and of new pedagogical methods. The teachers' arguments however, were less compatible with Blackboard. A positive environment for using technology was reported at both institutions. At BI they were more positive to test out new pedagogical methods than their colleagues at HiBu. However, both teacher groups saw Blackboard as a relative poor facilitator for a more flexible organisation of teaching and learning.

These findings are integrated in a model to predict a possible outcome of this innovation process. According to the model, the outcome of the innovation process at the two institutions is relatively pessimistic. Low scores on profitability and intermediary scores on compatibility at the college of Buskerud indicate that Blackboard will either be rejected or enclaved with an isolated position. The prognoses for BI are somewhat more optimistic. Here Blackboard is more likely to be institutionalised.

A paradox is however, that Blackboard to a large extent is implemented and used at HiBu, and the use is rising. One explanation for this contradiction can be that the assumptions about profitability and compatibility are false or inaccurate. The general satisfaction with Blackboard is often related to Blackboard for distribution of information and course material, and less on Blackboard as a facilitator of new innovative pedagogy. Teachers were often either uncertain as to how they could explore these possibilities, or they were simply not interested. The teachers also rejected the assumed economical advantages. If the assumptions about profitability and compatibility were more directly related to Blackboard as a tool for course distribution and classroom teaching support, and less to Blackboard as a facilitator of new innovative pedagogical methods, the findings of the study would have shown a greater possibility of institutionalisation of Blackboard at both BI and HiBu.

An alternative explanation for the contradiction between the teachers' perception of profitability and compatibility, and the rapid implementation rate of Blackboard at HiBu, can be that external and/or internal normative pressure also affects the innovation process. There is a perception of pressure among colleagues to offer all students a predictable and identical source to information. There is also a perception of pressure from the administration to follow

the institutional strategy. Some argued that the expectations of an external pressure from students, demanding more use of ICT in the course activities, lead to an implementation of Blackboard. It is likely that both perception of profitability and compatibility, and normative pressure together affect the institutionalisation of Blackboard at BI and HiBu.

However, change is an ongoing process, not a short event. The innovation process at the two institutions has not yet reached the point of institutionalisation or termination. The teachers' view on the profitability of Blackboard as a pedagogical tool can change and become more positive. When the teachers get more familiar with the LMS, they can expand their use and explore new teaching approaches through Blackboard. Normative pressure can also change character and importance over time. Normative values, affecting the institutionalisation process, may shift through new strategy plans. This is the case for BI. In the new strategy plan for 2003-2005 the strategic focus has changed and ICT is not mentioned explicitly. It is no longer one of the most important strategic goals to become a leading actor in the use of ICT. Further research could analyse how this new strategic focus affect the institutionalisation process of Blackboard at BI.

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10. Appendix

Appendix 1

Spørsmålsguide:

Profitability

- I hvilken grad følte du et behov for et elektronisk undervisningstøtte verktøy, som Blackboard før det ble implementert?
- I hvilken grad følte du behov for å forbedre kommunikasjonen mellom deg og studentene? Har verktøyet forbedret denne kommunikasjonen?
- I hvilken grad følte du behov for å forbedre kommunikasjonen mellom deg og de øvrige kollegiene? Har verktøyet forbedret denne kommunikasjonen?
- Hvordan ser du på fjernstudenter sammenliknet med campus studenter?
    - Er de viktigere, like viktige eller mindre viktige?
- I hvilken grad er det viktig for deg å redusere kostnadene på dine undervisnings aktiviteter?
- I hvilken grad følte du et behov for å forbedre/ endre din undervisningsmetode?
- Så du på e-læringssystemet som et verktøy for å forbedre undervisningen?
- I hvilken grad føler du et behov for å bli mer innovativ og kreativ i dine undervisningsmetoder?
- Så du på e-læringssystemet som et middel for å bli mer innovativ og kreativ?
- På hvilken måte ønsker du å bruke Blackboard i din undervisning? Først og fremst som informasjonsformidling eller også som et pedagogisk verktøy hvor deler av undervisningen kan foregå på Blackboard?

- I hvilken grad opplever du at en elektronisk lærings arena som Blackboard tilfredstiller dine behov som foreleser? (som kommunikasjonsverktøy både mellom student-forleser og fagansvarlig- forelser, som hjelpemiddel for å forbedre kvaliteten på undervisningen gjennom mer fleksibel undervisnings former, annet?)

- Hvis du mener at Blackboard ikke tilfredstiller dine behov, hva er grunnen til det?

Compatibility

- I hvilken grad føler du et behov for en mer fleksibel og effektiv organisering av undervisnings og læringsprosessene ved ditt institutt. El høyskole?

- Hvordan stiller du deg til bruk av IKT eller teknologi generelt i undervisnings- og læringsprosessene ved ditt fakultet/ høyskole?

- Hva synes du generelt om de pedagogiske metodene du bruker? Kunne du bli en mer innovativ lærer gjennom å bruke e-lærings metoder?

- I hvilken grad synes du at mulighetene som ligger i en elektronisk lærings arena som Blackboard, er relevant for deg som foreleser? (fleksible læringsformer, asynkron/synkron kommuniksasjon)

- Har du endret deler av undervisningsmetoden etter at du tok i bruk Blackboard som undervisnigsstøtte? På hvilken måte?

- Hvis ja, oppfatter du og/eller studentene dine at det har bedret kvaliteten på undervisningen?

- Versjonen av Blackboard som er i bruk på …… er laget med utgangspunkt i gitte metaforer for hvordan god undervisning bør organiseres. Hvordan oppfatter du at disse metaforene har relevanse for din undervisning?

- Hvis en tar utgangspunkt i at Blackboard kan bidra til å endre undervisningen. Føler du at det blandt faglærerne på …er en positiv kultur for en slik endring, eller er det et ønske om å fortsette som før..?

- Generell kommentar om hvordan det er å bruke Blackboard som undervisningsstøtte.

Appendix 2

Anvendelse av IKT i norsk universitets- og høgskolesektor - En internasjonal komparativ analyse

Spørsmålsguide

Den historiske konteksten

- Når tok man i bruk IKT i undervisningssammenheng for første gang ved institusjonen?
- Hvem tok initiativet?
- Hva var formålet?
- Hvordan var reaksjonene fra andre fagmiljøer?
- I hvilken grad var institusjonens sentrale ledelse involvert i initiativet?
- Hva vil du si kom ut av disse første forsøkene med å bruke IKT i undervisningen?

Dagens strategier og målsetninger for bruk av IKT

- Har institusjonen i dag en (strategisk?) plan for hvordan IKT mer systematisk kan benyttes i undervisningssammenheng?
- Hvordan ble eventuelt denne planen utviklet? (hvem var involvert/grad av deltakelse fra fagmiljøene/kopling opp mot andre målsettinger institusjonen har for sin utvikling?)
- Hvordan vil du vurdere hensiktsmessigheten og gjennomførbarheten av denne planen?
- Vil du si at planen/strategien er kjent og akseptert på institusjonen?
- Hvis en overordnet plan for bruk av IKT ikke eksisterer, har det enkelte fagmiljø utviklet sine egne strategier og planer for bruk av IKT?
- Hvordan tenkes satsningene på IKT å koordineres på institusjonsnivå (innkjøp, drift etc.)
- I hvilken grad har forhold utenfor institusjonen spilt en rolle i forhold til de strategier/mål/tanker institusjonen/instituttene har gjort når det gjelder bruk av IKT

i undervisningssammenheng (utspill fra departementet, krav fra studentene, tilknytning til samfunns-/næringsliv etc.)?

Implementering, organisering og ledelse

- I hvilken grad er den sentrale ledelsen ved institusjonen involvert i de aktiviteter som pågår for å utnytte IKT i undervisningssammenheng (er den aktiv i å "markedsføre" IKT som verktøy i undervisningsprosessen)?

- Har en større vekt på IKT i undervisningssammenheng endret oppfatningene knyttet til hvordan læring/undervisning bør foregå? (er IKT et supplement til eksisterende undervisningsopplegg eller ser man for seg at IKT vil endre på selve læringen/undervisningsmetodene)?

- I hvilken grad kurses/læres fagpersonalet opp i forhold til å kunne utnytte de tekniske mulighetene IKT innebærer (organisert opplæring/tilfeldig/frivillig)?

- I hvilken grad er studentene pådrivere i prosessen med å utnytte IKT i undervisningssammenheng?

- I hvilken grad er det knyttet økonomiske ressurser til satsningen på IKT?

- Hvordan er den tekniske støtten/"support" til fagpersonalet organisert (en sentral enhet/desentralisert ekspertise/annet)?

- I hvilken grad er fagpersonalet involvert i avgjørelsene knyttet til implementering av IKT i undervisningen (valg av tekniske løsninger/organisering etc)?

Effekter?

- Hva vil du si har kommet ut av satsningen så langt?

- Kan du nevne eksempler på bruk av IKT i undervisningssammenheng som du mener er svært vellykket? (hvorfor vellykket/for hvem)?

- Hva er de største problemene i forhold til å få utnyttet IKT som undervisningsverktøy (personale er uinteressert/ikke teknisk kyndige/økonomi/ledelsesforhold/annet)?
- Hvilken enkeltfaktor mener du har størst betydning for at IKT i større grad kan utnyttes som lærings/undervisningsverktøy i høyere utdanning?

- I hvilken grad kan nasjonale myndigheter bidra i denne prosessen?