

MANAGING DISTRIBUTED LEARNING IN HIGHER EDUCATION

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Abstract

The use of ICT in higher education is becoming increasingly widespread. In Sweden, it is possible to study courses on university level in a distributed learning context, using locally placed learning centres (LC). The aim of this paper is to identify implications in order to manage and improve the conditions for distributed learning in higher education. Our conceptualisations of distributed learning are faced in the real work environment at four different learning centres in Sweden. A case study with 11 interviews was conducted. The results show that a LC promotes socialisation as well as technical and administrative support. Communication on organisational and pedagogical levels between LC, universities and students are however not satisfactory. Thus, we argue for the importance of learning centres as mediators to facilitate a locally constructed learning context. We suggest a management strategy for improving such context.

Keywords: distributed learning context, organisation, management, higher education, learning centres.

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Suggested track: H Leadership and HRM in knowledge-based organizations

1 Introduction

Distributed learning has become a fascinating area for many researchers to address as the use of ICT for such purposes is becoming increasingly widespread. There is no doubt that the credibility of distributed learning is challenged by the hype-up interest in distance education resulting from new providers entering the arena as a result of the present technological development and public attention. Alavi & Leidner (2001) say that nowhere is the question of the impact of ICT more important than in the field of education and learning. It is the foundation of a whole new environment that is gradually encompassing all aspects of distance education and life long learning. In the field of distributed learning in general and distance education in particular much focus has been on studies concerning interaction and collaboration among virtual student-teacher situations (Lally & De Laat, 2003). The field has also been studied by different disciplines such as pedagogy, computer science, sociology and psychology. For this reason, we do not recall the research that focuses on learning from a student-teacher perspective (Bååth, 1996; Säljö, 2000; Lave, J.& Wenger, E. 1991). The majority of these studies emanate from the class-room metaphor in which advanced, web-based

technologies are used, but where the learning context still is delimited to a certain place, usually the university campus. The university *campus* is traditionally the place where the production of learning and research takes place. However, some argue for a paradigmatic shift into theories of learning, from individual to social, distributed and situated views of learning (Brown, Collins, & Duguid, 1989, Lave & Wenger, 1991). In order to succeed in distributed settings, recent research also shows the importance of the social dimensions of learning (Wenger, 1998; Svensson, 2002; Säljö, 2000). Recent research has put effort into interaction and collaboration (Andreassen et al, 2003; Chan et al) but few of them focus on socio-cultural, administrative information and organisational contexts.

Over the past years there has been an increased need of implementing ICT in higher education that has led many universities and colleges into a more distributed management and implementation of education and learning, for example the various forms of distance education (DE) (Stensaker & Skjersli, 2002). One form of DE is the learning centre-based education (LC-based education) widely developed and spread in Sweden. Learning centres are geographically dispersed from the university campus and offer a local and physical place to participate in distance education. Universities are always responsible for the education when they collaborate and arrange education in the learning centre environment. A learning centre in its turn is governed by municipalities and is often organised in cooperation with the local companies and cooperative organisations. The LC-based DE combines asynchronous web-based content and communicative techniques with sessions of synchronous video conference sessions. Learning centres provide video conference rooms, computer labs, as well as technical and administrative support. The rise of the learning LC-based education poses many interesting questions.

On a general level, one can ask what happens to an organisation when its core processes are out-located and distributed over a wide range of mini-campuses, e.g. learning centres. What happens to higher education when serviced by other actors than the university? Distributed learning centres change the learning situation in many different ways. This urges for development and evaluation of facilitating learning environments as well as support functions for learners and other involved actors, who are dispersed. In that perspective a lot of effort is needed in order to consider the management and process behind a well-functioning incorporation of ICT in teaching and learning environments. Stensaker and Skjersli (2002) question whether it is possible to develop qualitative ICT initiatives (such as LC-based learning

environments) without adequate organisational, administrative and managerial support. Organising interaction and collaboration in distributed learning contexts is complex and can impose severe workloads on teachers, learners and other parts of the activities (Gurbye & Andreassen & Wasson, 2003). Understanding and identifying what is to be considered when *organizing* and *facilitating* distributed learning contexts is therefore a key issue.

The aim of the study is to understand the role of learning centre-based environments and to explore implications for improving the organisation and management of distributed learning in higher education. The *research question* is: What happens with higher education when it becomes distributed and other actors are involved in the realisation of learning centre-based education? How does a LC-based environment support distributed learning? What are the implications to improve such contexts? We argue that there is a need to re-conceptualise the teaching and learning responsibilities of universities in order to meet expectations and to drive the change to an essentially more client- or student-centred view of university teaching and management. However, we are not arguing that university organisations will become similar to business organisations. The supplier-customer relationship does not hold in a learning context. Learning must be considered as a socially constructed phenomenon as there are other driving forces within a learning context such as individual motivation and satisfaction. Therefore we apply a bottom-up strategy and we have directed our study to consider “the other voices” in these new distributed learning contexts. We suppose that the local environment at a LC plays an important role in terms of the many people involved (in particular LC staff members) as well as the practical occurrences. We do acknowledge the student perspective (such as learning outcome, performance, satisfaction, motivation, etc) though the focus in this study is placed on the environment that is to support both teachers and students in their situations (teaching as well as learning). In this environment we explore certain factors, processes and people that probably do play a vital role in order to manage and facilitate a creative and an innovative learning context. We view the concept of learning as a situated process along with other social and contextual processes incorporated. As Guribye et al (2003) further argues distributed collaborative learning should be viewed “as a new phenomenon relying on its *own specific conditions*”. From a learning perspective it is interesting to get a thorough understanding of what kind of mechanisms and processes are vital in the LC environment and from this understanding explore how this can be facilitated and managed by the university.

2 Theoretical Framing of Distributed Learning

Information and Communication Technology (ICT) has a substantial impact when applied to the educational field (Alavi & Leidner, 2001). In the perspective of life long learning ICT not only creates possibilities but also increases the need for flexible solutions supporting collaborative learning anytime and everywhere. Initiatives so far have focused on the use of collaboration tools, such as Learning Management Systems (LMS-systems), e.g. WebCT and Blackboard. But in order to succeed in distributed learning in general and distance education in particular, recent research shows the importance of understanding the social dimensions of learning (Wenger, 2000; Svensson, 2002), along with pedagogical and technical dimensions. There have also been considerations about a cognitive view of learning (Simon, 1996; Dreyfuss & Dreyfuss, 1986). There is also a need for more holistic studies on the collaboration in and between organisations of learning, both the physical and virtual environment, in which learners, teachers, administrators and support staffs are learning, acting, working and communicating. The interaction and collaboration among the different actors need satisfying environments and co-ordinated support systems containing pedagogical/social, administrative and technical facilities when participating in distributed learning situations (Dahlman & Eriksson, 2003). The question arising from this is if these efforts really give any effect in the local environment? Collaboration and communication between local, regional and national organisations, i. e. the structural conditions that exist are unclear and insufficiently studied. The recent study made by Hellsten and Roos (2002) shows that initiatives and efforts often risk failing if they are not interwoven with the existing local development processes. This coincides with what Lainema (2003) argues. He says that the weakest part of creating a constructive approach to distance education and ICT-based learning is the lack of considerations about environmental and contextual factors, such as physical environment or social, organisational, and cultural aspects of the environment. Some argue that, for universities to be successful in distance education they will need to adopt *service management* approaches to deliver a quality product. However, it could be questioned whether it is possible to develop high quality DE initiatives without thorough organisational, administrative and managerial support (Goodison & Goodison, 2002; Hellsten & Roos, 2002).

2.1 The Concept of Learning Centres

From a university point of view, the educational services and products could be packaged according to the university concepts on distributed learning and flexible education. See figure 1.

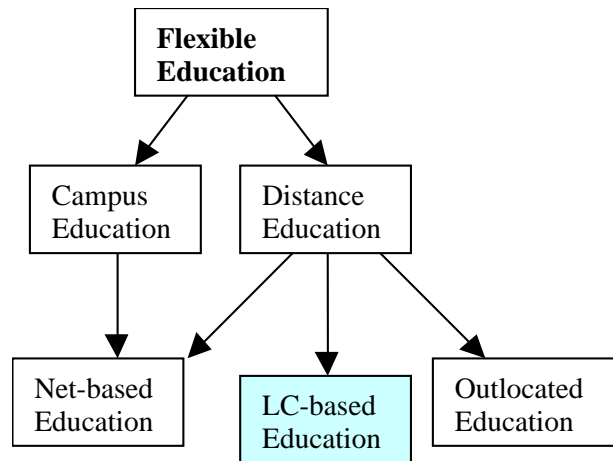


Fig. 1. Type model for flexible education with a focus on LC-based education

To position our view of distributed learning (flexible education) we focus on the learning-centre based form. LC-based education has been shown to be important to reach groups with little tradition of completing a higher education, which municipalities all over Sweden have adopted. According to Ljusberg (2002) approximately 135 LCs has been established to give easy access to and facilitate distance education on university level. Only this year more than 100 new centres are being established in Sweden. The learning centre's purpose is to give citizens access to a local study environment, with IT-support, administrative support and pedagogical guidance. Learning centres though, are heterogeneous with different work domains. Some learning centres create learning environments from high school education to higher education for adults, while others only provide opportunity for higher education with the aim of creating a local university campus. In this rapid development it is interesting to study LC as an IT-intensive environment and what role it really can play. For the learning centre-based context, see figure 2.

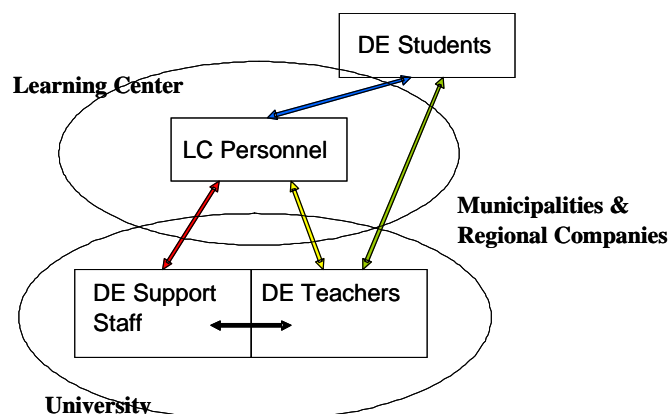


Fig. 2. The LC-based education in a distributed learning context

LC-based education is conducted as networks of learning centres that offer a combination of videoconference sessions and physical meetings. Communication and lectures are performed by bridged video sessions with up till 25 participants in a conference at the same time. ISDN is the most common protocol but IP (Internet Protocol) is also used, sometimes in a mixed bridge. In between video conference sessions, teachers and students are using net-based platforms or learning platforms for exchanging information course materials, chat, discussion board etc.

2.2 Distributed Learning Frameworks

Several frameworks for distance education in general and web-based learning technologies in particular have been developed. In order to position our study that we claim is conducted from an organisational point of view we have been inspired from Kahn's framework of web-based learning technologies (Kahn, 2001). See table 1.

Table 1. Kahn's framework of web-based learning technologies (Kahn, 2001).

Dimension	Properties
Institutional	Administrative and academic affairs, student services
Pedagogical	Teaching and learning strategies, didactic models
Technological	Infrastructure, software, e-learning platform
Interface design	Interface design, usability and accessibility of content
Evaluation	Assessments of learners, instruction and environment
Management	Management of the learning environment and information
Resource Support	On-line support (FAQ, helpdesk, etc) and resource required for effective learning
Ethical	Social and political issues, accessibility, etiquette, legal issues, privacy

What we can see is a layered model of eight different dimensions to consider in web-based education. These dimensions have their own properties and processes to consider for such learning contexts. He argues that one can use one or more of these dimensions in order to focus upon a certain issue such as to support and design web-based learning. The applicability of the framework is to transform and establish these dimensions into sound quality parameters for one specific distributed learning context. Other studies show similar refined models for framing the different aspects for distributed learning contexts (see for example Vantaggiato, 2004).

If one takes a particular focus on the organisational issue, i.e. how the management and organisation of distributed learning contexts (or what Kahn (2001) would call “institutional” or “management”) we recall the work of Ramsden (1998). He discusses the specific challenges for managing learning in higher education. One of these is to facilitate environments that encourage approaches focused on understanding and close engagement with the fragile contexts that learning centres are a big part of. He argues for the leadership and management issues of distributed higher education. Herein, the academic work must involve all colleagues that actively participate in the production, support and supervision of distributed education and learning. However, what comes to his understanding is that there is no ideal model to be captured and rendered down into a series of managerial guidelines. Instead he sees the management challenge as a change process that highly influences the outcome of both teaching and learning.

3 Research Method and Context

In order to get thorough understandings of how to manage distributed learning in higher education we designed our study on what actually works and does not work in such contexts. Therefore we carried out a case study in which our interpretations of the people work practice, processes and mechanisms were explored. We involved four particular LCs in Sweden and we involved people from LCs administrative and management staff in the interview study. Their functions were LC managers, tutors, administrators and technicians. All together we conducted 11 qualitative interviews. The educational domain was a bachelor program, full time studies, in social science. In order to observe the physical context and practical work at a LC we visited four of the LCs and spent approximately six hours at each LC. Several on-line discussions via telephone and video conference sessions were done. We aimed for a holistic view on what people actually spent time on in their daily work (Easterby-Smith & Thorpe). Also,

we paid attention to their spontaneous reflections on how the technical as well as organisational work was carried out. Such reflections could contain issues about information and communication between the different actors at the university and the LC staff. Other issues that were considered were their knowledge and influence on the learning context, for instance their role in such context, and their knowledge about the pedagogical model and the technology support.

Our conceptualisations of distributed learning are in the real work environment at four different learning centres in Sweden. We carried out a case study during the year of 2003. The study started at the Arvika Industrial Center (AIC), in the midwestern region of Sweden near the border to Norway Arvika, and continued in Hultsfred, Vimmerby and Västervik, three municipalities in southeastern region of Sweden, called northern Kalmar region. AIC is an economic union owned by the Arvika municipality and different associations supporting business development, unions and the local bank in Arvika. AIC is an umbrella organisation in which the learning centre is one division. The three LCs in northern Kalmar region collaborates in a network and are working tightly together as an umbrella organisation particularly within competence development and education.

The overall aim for both of the projects/learning centre business is to support competence development in the municipality for (both) industries as well as individuals and with main focus on higher education. The centres are placed in rural areas of Sweden with high unemployment and vanishing companies. To counteract these forces and to allow people to be able to live and work the European Union funding has been the fundamental financier for the centres in both Arvika as well as in the northern Kalmar region.

All four LCs are to be considered as well equipped LCs. These general basic functions are to have environmental appropriate locals, computers in networks (LAN, broadband), video conference equipment, fax, copy righter, TV/video, support personal, administrative student support, library and examinations possibilities etc.

One of the authors is working as a coordinator for distance education. Partly, she is the problem owner who means both good insights in the actual conditions of LC-based DE as well as unintentional bias of the domain. For this reason it is valuable to have the LC staff's perspectives on distributed learning, locally governed as mini-campuses (LCs) located far from the university.

4 Results

The interviews conducted aimed to find out what mechanism and forces constitute the staff's daily work. From this understanding we have derived and analysed different implications for improvement and enhancement for LC-based DE.

The analysis of the result from the interviews were categorised into implications categories, inspired from the framework of Kahn (Kahn, 2003). The framework is a meta model that is sufficient when focusing on the whole DE area. We have used the model as an inspiration and modified it to be convenient for this study. The implication categories we suggest are organisational implications, pedagogical and social implications, technological implications, communication implications, and support implications.

The ones interviewed were LC managers as well as tutors/technical/administrative staff. Their answers did not differ significantly from each other, and are summarised below.

4.1 Organisational implications

Kahn's model (Kahn, 2003) suggests dimensions of institutional and management which we include here in the organisational implication. Figure 2 gives an overview of the context in which the university organisation relates to the LC organisation. These organisations depend on each other in DE but play different roles. LC is heterogeneous organisations and depends on the municipalities financing from year to year. In that perspective it is crucial to evaluate and define the LC staffs role of as well as the roles for the university staffs, i.e., both teachers, program co-ordinators as well as administrative and technical support staff. Management on both levels along with information exchange is in focus. The main questions asked were how LC managers and tutors view the role of the LC and how they analysed their own roles as participants in the bachelor programme of Social work/Social science.

The following quotation summarise these issues:

"...initially good and sufficient information from UTU. The LC role is to be the link between LC and UTU"

"...we want to stay in the background and to be there for the students when needed". "I am well informed by the UTU personnel as well as from the teacher staff concerning the education..."

Issues about the role of being a tutor as well as the role of the program co-ordinator at UTU:

“We agreed on what role the LC personnel will have, particularly the LC tutors role, even if it wasn’t described in writing”.

“...there were some problems with the tutor role in the beginning, but that does not depend on bad information from the teachers, I think that such changes take time”

“ When there is a question about something in the education, I always contact the program co-ordinator at UTU. She is always available and gives quick answers”

From these quotations we draw the conclusion that information from UTU during the program courses is easy to get. What also was become very obvious during the interviews was that the program co-ordinators role is vital and plays an important function for the LC staff to co-operate with.

4.2 Pedagogical and Social Implications

The pedagogical teaching and learning didactics as well as the strategies are shaping the learning platform and environment as well as adding to the social issues for the students. The respondents’ answers regarding this were raised in different ways during the interviews. The pedagogical model is fundamental for the way a whole educational program progresses and constitutes the learning context for the students (Ramsden, 1992). In this case it is also of importance to get a deep understanding of how the LC personal are supporting the pedagogy as well influencing it. Questions here concerned how well the pedagogical model was known by LC staff and used by the students. Some significant answers:

“Functioned well, tough start for the students in the beginning of the education, especially the base group exercises that I after a while realised where targeted to cause conflicts within the groups”

“I felt secure in my role as a tutor, and knew that I didn’t have to solve problems, they could communicate with teachers at UTU”. “I just listened and was there for them.”

“I find it extremely inspiring to support and listen to the base groups. I try to show trust and my goal is to have the responsibility for the education.”

“The co-ordinator at the program in UTU is very important for the support of the base group work when problems arise, she has the responsibility, and I just guide the students.”

All of the LC staffs agreed that studies at learning centres are more satisfying than studies at home. On the question as to why using an LC as a learning environment is better than at home, a LC manager stated:

“because of the pedagogy. I think that students find group study useful You have support from each other. Sitting alone on my own room is much harder.”

The results show the importance of accessibility to a physical, social and supportive environment for realising base group work. The LC-based education supports the pedagogical model and learning seen as socially constructed (Säljö, 2000).

4.3 Technological Implications

The technological issues concerned the DisCo platform (Learning Management System), video conference systems, Marratech (net-based meetings/video over IP) and daily PC use. Problems with technological tools are often the main issue why students drop out early from DE (Nyberg & Strandvall, 2000). This case study also showed some technological problems, especially initial problems. These answers showed this:

“Initial problems with Disco functioning, but I heard that there were some new versions installed when the education started during the fall.”

“I think the teachers could manage the video conference system better in some sessions. They act very insecure.”

“I have heard that students want to have more continuous video conference sessions”

“We installed the Marratech system on three computers here, and eventually we got it up running, but the students haven’t used it? I think it is because the teachers are not pushing the technology. I like the system, but someone has to push the start button.”

One LC person stated this issue regarding the IT-use on one particular LC:

“I think there is more to do in increasing the use of the equipment here on LC. One notices that a lot of work is made at home, which of course is a part of the distance pedagogy, but I would like some more go on the centre here.”

Some explanation about the initial problems could also be that the ICT maturity among teachers as well as students was low when the programs started. It is obvious that teacher skills in ICT for DE are crucial when performing this kind of education. Another factor was that UTU implemented a new student portal along with a new version of DisCo.

4.4 Communication Implications

LC-based education depends on well functioning collaboration structures between LC’s and the university. Communication on different levels is vital for student satisfaction, see figure 2. We asked questions concerning interaction between LC staff and

university staffs, teachers, technicians and administrators. Most of the respondents were satisfied with the communication with UTU, but some results show some problems mainly on universities not communicating with LC in time before, under and after course realisation. An administrator meant that universities do not have insight in work conditions locally:

“We work individually apart”.

Although sufficient web based systems are available, still, this kind of problem is valid. However experience the communication with the LC staff as satisfactory. Could it be that distance really matters in spite of a variety of technical tools? Here the LC really serves as the communication mediator between students and universities.

Another respondent said it like this:

“I do not have so much communication with the teachers at UTU. I mostly get good information from the student that is here. Though I have very good contact with the course secretary at UTU, especially when there are examinations that must be prepared.”

The feeling is that communication is not a big problem, and that the LC staff considers it their responsibility as well as the responsibility UTU. What really could be better is to have a lot more information available on the Internet, instead of collaborate directly by phone or e-mail.

4.5 Support Implications

This implication concerns how support services have been accomplished. Focus is on how to manage and support students during the education. How has the support from the university to students and LC staff as well as local support from LC staff to students been working?

The overall conclusions are that the students are pretty satisfied with the support on the LC. The administrative support on the LC has high availability. However there are some problems on both LC levels as well as on the university level that could be solved to increase student satisfaction.

“There has been a lot of changes in the scheduled video conference sessions, and we have not been informed in time, even if we tried to reach UTU personnel to find out when it will be?”

Some overall conclusions regarding the technical support are that the distribution of software from universities to LC often is delayed. This brings the LC into a delayed

installation process along with common problems on software implementation on PC's in local area networks. There have also been some problems to get any help from UTUs helpdesk when problems have occurred with the DisCo system.

"Huge initial problems with DisCo, the LMS system, but eventually it has been working when we on the LC also could access DisCo"

Another statement though shows that UTU does not have the worst support functions:

*"..good technical support compared to other universities we are collaborating with here on LC."*⁸

One LC manager has a suggestion of solving the problems addressed above:

"A student kit along with instructions could overcome some initial problems."

5 Summary of results

The following conclusions are a summary of the findings we have analysed from the results of the case study:

- The anytime-anywhere analogy must be reconsidered: Distance matters. New target groups for higher education are reached through learning centres in rural areas. The local occurrences on micro-level were extremely important. The people and the environment at a LC provide extremely important functions and services that affect the local occurrences (in different ways) of DE.
- Technical and administrative personnel are crucial for realising higher DE in LC-based contexts: There were also "new" actors playing the game of LC-based DE that needed to be considered. They had heterogeneous perspectives on what role the LCs play. Many role metaphors were identified and they ranged from "mini campus", "embassy", "regional engine" to "meeting place for a socially constructed learning environment".
- Learning is socially constructed: Bottom-up perspectives must be valid in LC-based DE. Many people were involved with complex interactions between actors at the LCs and the university that must collaborate satisfactory. Facilitation of information co-ordination and knowledge sharing are important factors to suffice the bottom-up perspective.

6 Concluding Remarks

When Universities become distributed in their way of organising distance education they need to consider the responsibility and relationships to the LC, as they, in a way, take over and function as mediators for distributed learning. We cannot forget that LCs are new type of organisations, driven by municipalities, often financed through projects. This puts considerable pressure on University organisations to establish integrated and well-organised LC networks. Here the LCs can serve as mediators between the university and the local students. The quality issue is apparent. According to Goodison & Goodison (2002) quality is more about managing collaboration and networks in which organisational responsibility and trust are true ingredients. Both roles and competencies must be defined in a way that explicitly support the actual work at a LC. However, on both communication levels, organisational and pedagogical, universities must give better information and communication.

6.1 Implications

Even if the technology provides possibilities for the anytime-anywhere-analogy of education we have in this study challenged this analogy. Instead we found that distributed learning *affects the local occurrences* in different ways. It is difficult to overestimate the local occurrences and conditions that the learning centres offer. The anytime-anywhere analogy must be re-considered, and take many more aspects into account than the time and space issues. In this study the LC offers a local physical campus environment for studies as it provides a socially constituted learning place with technical and administrative support functions. The learning centre is a big help for the students participating on a LC. A LC can contribute to social contacts if universities can create pedagogical learning centre based courses that support social group work. Administrative and technical support at the LC obstructs students from dropping out.

A mapping of learning centres describe LC as a context, an environment, for learning, a kind of meeting place where students can get technical and administrative support, before, during and after education. LC consists of different functions categorised as a meeting place, a broker or a so-called engine for regional development (Hellsten & Roos, 2002). The primary role of the learning centre herein, is to provide a context with both technical and social support. Therefore the pre-conditions and support facilities are extremely embedded in the contextualisation process that distance education really needs. To some extent the social supports for creating a contextualised distance education is about creating trust and responsibility (Goodison & Goodison, 2002; Ramsden, 1998). Also the results reveal that well-established learning centres serve, as injections and networked links for individuals' and municipalities' educational needs.

This means that a LC becomes an actor that actively plays the role of a mini campus as well as an embassy of distributed flexible education that needs to carefully be managed by the university. The university must take the responsibility of quality perspectives on this “new” actor. Another issue that our results show is that both the learning centres- and the municipality’s leadership will have to work with a clear and distinct vision for the learning centre-based implementation, along with strategic and long-term financing. These triggers us to suggest a preliminary strategy for how to improve management of distributed learning for higher education, in terms of vision, management, and practice.

6.2 Strategy

Vision – the best visions for managing distributed learning environments are simple ones focused on profoundly-held commitments, purposes and values (Ramsden, 1998). Visions should be flexible enough to permit people to exercise choice and to allow for continuing relevance when conditions change. But where do visions come from? One notion is that visions spring from the “collective mind” (Ramsden, 1998) of a group of staff; the management draws out and articulates ideas that are already latent. Another notion is that the head has an idea and encourages staff to develop a commitment to it. Generally, these strategies might be called top-down or bottom-up. We argue for a bottom up vision in which we identify a continuous process requiring intense communication both internally and externally among the different actors. The energy and motivation among the LC staff members were apparent.

Management – in order to create a harmonious work and learning environment at the LCs good management planning is essential. In a distributed setting these issues become even more important as complexity increases when a lot more units and people are involved (Stensaker & Skjersli, 2002). Many varying views exist and it is extremely hard to ensure that commitments are met and quality assured without systematic preparation. To this issue we consider that information and communication between the various actors are of crucial importance. In the distributed context we recall the use of ICT: the infrastructure as well as the software tools. Such ICT support should also be incorporated into a well-defined flow of interaction among the different actors. In our study the technical implications were delimited to the novel use of such systems. All staff members were not aware of or comfortable with the dedicated systems. This implies that the work practice at LC was not aligned to the management ambition and ICT system. Quality handbooks and student kits, role definitions, work

procedures/best practice, IT systems integration could be important mechanisms to support this.

Practice – It is important that the practice of distributed learning in higher education functions (Andreassen et al, 2003). No managerial structure and implication can be effective unless the daily practice and local occurrences work well. This also means that people have to have the right information in order to improve their work and act knowledgeably. However, for the case of LCs we have found that there is an emphasis on facilitating learning rather than disseminating information and knowledge. We have seen how the LC staff members collaborated and engaged in the daily work of facilitating a distributed learning environment. Their motivations and commitments to their work are of crucial importance. Many of the respondents had established the right kind of spirit for this.

7 Further Work

Even if ICT is forming the environment in distributed learning environment, it also has considerable impact on the nature of the learning context and social interaction. Too few studies of what role LC really have on students' performance have been made. We know that ICT increases the possibilities to flexible solutions and net-based university courses, but the loneliness and the high student drop-outs are unfortunately high compared to regular campus courses (Bååth, 1996; Nyberg & Strandvall, 2000). One problem is simply that individual distance students scattered over a large area have little or no contact with each other. This problem is of specific concern, as more and more institutions offer their courses distributed over various geographical regions. Deeper analysis is needed to indirectly understand what the LC environment means for students' learning processes and to get better knowledge about implications for designing and creating good administrative, technical, organisational and pedagogical support functions.

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