E-readiness of University Divisions in Online Education

Abstract

E-readiness can be defined as the degree to which a community is prepared to participate in the networked world. In this paper the concept of e-readiness is used in terms of how internal and external factors affect the delivery of online education offered by universities. The paper applies the macro level five forces model as adopted by Chan and Welebir (2003) in the context of micro (university divisional level). Thus, the purpose is not to have generalizable findings, but rather use the delivery of online education as determinant for the level of universities' e-readiness, and explore the factors affecting e-readiness and ways of utilizing the factors as central to the study. Using a qualitative method case study interviews on divisional level were used to obtain in-depth empirical evidence. The study appears to indicate potential need to further modify the five forces model by Chan and Welebir (2003) due to the non-commercial nature of the Swedish education system. Also, co-operation in providing educational services such as the Net University in Sweden precludes market forces determination by universities internally. No specialized training program for the instructors to fit any special needs of students particular to online education was perceived.

Keywords: E-readiness, Online Education, University, Internal and External Factors

INTRODUCTION AND RESEARCH PROBLEM

E-readiness can be defined as the degree to which a community is prepared to participate in the Networked World (McConnell, 2000). The concept of e-readiness is often used as a standpoint of a country or a company. E-readiness from a company's perspective refers to how well prepared this company is for using Internet in their business, covering both external factors (factors outside the company) and internal factors (factors within the company). We would like to apply the term of e-readiness in a slightly different context. In our case we are looking at how prepared universities are to offer education online. In a sense, the students taking these courses can be considered as customers.

Online education is something that has become more and more common, especially in higher education. It offers the potential to reach students and individuals that would otherwise find it difficult to read courses at a university. The reasons for offering online education often relate to these four categories: it expands access, alleviate capacity constrains, capitalizes on emerging market opportunities and serves as a catalyst for institutional transformation (Volery and Lord, 2002).

The literature on online delivery in the field of education has grown rapidly since the early 1990s (Hassan, 2001). Distance learning is a concept that deals with any approach to education deliveries that replaces the traditional classroom setting. Computer-based learning, distributed learning, interactive distance learning and e-learning are other concepts found in the literature as well as there are many terms for online education, such as virtual education, Internet based education, web-based education, and education via computer-mediated communication (Paulsen, 2002). Our chosen concept for this study is to study the online delivery of education.

Both external and internal factors will influence the readiness of online education delivery. Examples of external factors are: the IT-infrastructure around the universities and in the country it operates. Two other external factors are the support available from the government and different organisations and Internet usage for the population. Characteristics of the student as customers can also be looked at as an external factor and this has proven to be a significant factor when assessing the effectiveness of online education. (ibid)

An important internal factor when it comes to online education is the characteristics of the instructor (ibid). The instructor's attitude towards technology can be an important factor for the instructor. The attitude of the instructor will influence the attitude of students and their ability to learn. The internal infrastructure is also something that will affect the effectiveness of online distance education. It is impossible to ignore the new way of delivering education (electronically). When competitors start to offer this and when more and more students

are demanding this, a university would be in a better competitive position if they see this as an opportunity rather than a threat. The competition among universities, for example in Sweden, is much more evident today than just ten years ago. A university that is well prepared for offering effective online education will be able to get a competitive advantage, or at least not fall behind in the race. The concept of e-readiness in relation to online education also serves as a roadmap as to how IT should be implemented. Internet and IT is not only used for online education but also for communication and handling information, which in turn helps increase productivity and efficiency. We intend to conduct the research at a divisional level of the University. Our research problem is as follows: *internal and external factors that affect the delivery of online education at Universities.* To clarify further the, purpose can be described as to understand the level of universities' e-readiness in terms of delivery of online education and the main factors and how they can be utilized to improve online education (the product).

LITERATURE REVIEW

Technology

Among technology issue, Sanders et al (1995) argue that the reliability, quality and the medium richness are the key technological aspects to be considered. In particular, the networks set up should allow for both synchronous and asynchronous exchange; students should have convenient remote access and the network should be require minimal time for document exchange. Åkerlind and Trevitt (1995) further added that the quality of the interface also plays a crucial role. The literature concerning interface design for online delivery ranges from highly 'technical artistic' (e.g. Laurel, 1990) to highly technical (e.g. Blattner and Dannenberg, 1009). Reeves and Harmon (1993) went further to present a synthesis between these two tendencies and identify the following dimensions as being important ones in the user interface; ease of use, navigation, information presentation, aesthetics, and overall functionality.

Volery and Lord (2000) added that the perceived richness of the technology should also influence the delivery of online education. Daft and Lengal (1996) identified in their medium richness theory that a rich medium is one that allows for both synchronous and asynchronous communication and supports a variety of didactical elements (texts, graphics, audio and video messages). Cashion and Palmieri's (2002) study also found that technology and access contributed to most of the problems of online students. These included difficulty with connecting to network and downloading, missing or dead links, and limited access. Universal access through the development of an accessible and affordable ubiquitous technical infrastructure is viewed as the primary goal of online higher education (Lorenzo and Moore, 2002). It is an imperative that information technology facilities and technical help are adequate for both students and instructors. The online course must offer students opportunities to find and download complex and content-rich resources. Additionally, students must be taught how to work with the technology associated with online learning. Otherwise, they do not have real access to online education (Fulton, 2001).

Finally, for some students, cost factors become a major barrier to their access to online higher education (Ehrmann, 2001). Internet access can be expensive for those who live in rural and remote areas but conversely need online education the most (NCVER, 2003a). To sum up, technology needs to be accessible, reliable, fast and easy to use. Quality measures for access should therefore take into account all these key factors.

Instructors

a. Quality of Instructors

Interestingly, Collis (1995) argues that the instructor plays a central role in the delivery of online education: "It is not the technology but the instructional implementation of the technology that determines the effects on learning." Webster and Hackely (1997) suggested that three-instructor characteristics influence learning outcomes:

- Attitude towards technology
- Teaching style
- Control of the technology

Serwatka (1999) puts forward that students attending a class with an instructor who has a positive attitude

towards distributed learning and promotes the technology are likely to experience more learning outcomes. In a distributed learning environment, students often feel isolated since they do not have the classroom environment in which to interact with the instructor. However, to overcome this Volery and Lord (2000) suggested that instructors can provide various forms of office hours and methods of contacts for students.

Volery and Lord (2000) added that as students in online distance learning courses often face technical problems; it is therefore crucial that the instructor has a good control of the technology and is able to perform basic troubleshooting tasks. Organization skills go hand in hand with control of technology. According to Haynes et al. (1997) a designed instructor is essential for overall coordination and that, as development of an online course is labor intensive, both faculty and technical resources must be identified and committed to the schedule at an early stage.

b. Academic satisfaction

Academic satisfaction means that teaching staff involved should find online teaching effective and professionally rewarding. Important factors contributing to online academic satisfaction are opportunities for quality online interaction with students with greater diversity in background and interests; and opportunities for leadership, research, publication, recognition, collegiality, and professional development (Lorenzo and Moore, 2002). As online teaching requires "a vastly changed skill set from that of conventional face-to-face teaching" (Oliver, 2002, p. 4), ongoing staff training and development are essential to ensure staff readiness for online teaching and ICT developments.

Measurement of academic satisfaction may include ongoing and post-course surveys over online teaching staff's attitude, experience, and technical, administrative and moral support received for online teaching. Parasuraman *et al.*'s (1985) SERVQUAL instrument may be adapted to gauge the level of academic satisfaction through assessment of the gap between academic expectations of the support of their institutions for online teaching and their perceptions of what they actually receive from the institutions. Evaluation process is also identified as among factors affecting the success of online education. The intention is to highlight good or bad practice, detect errors and correct mistakes, assess risk, enable optimum investment to be achieved and also allow individuals and organizations to learn (Roffe, 2002). The reasons for undertaking an evaluation of e-learning are the same as for evaluating any form of learning experience. Purchasers of e-learning, managers of participants, and participants often want particular forms of information on performance.

Competitors

Regarding the external factors, Chan and Welebir (2003) adapted Michael Porter’s 5-forces model to analyze the competitive forces in online education market (See figure 1). Based on their research we identify competitors and students as the two external factors that affect the delivery of online education. The model is explained below.

The first source of competitors could be other universities within relatively close geographic areas, and universities with high brand image outside the geographic area of the institution (Chan and Welebir, 2003). This source of competition is not new to universities; however, as more universities add online education to their line of services, the rivalry will intensify (ibid).

Emerging competitor types are the purely virtual education providers (ibid). The Internet has allowed virtual education providers to enter the online education market without the typical barriers traditional institutions faced upon establishment (Graves, 2001). These competitors are creating brand awareness and marketing themselves as alternatives to traditional colleges and universities.

The third source of competitors comes from firms in other industries that offer substitute products (Chan and Welebir, 2003). Finally, a force of competition is the supplier of resource inputs (ibid.). The Internet facility throughout the country or community is an external factor, while the source inputs directly regarding course design could be either external or internal factor. Students represent the one part source of competition in Chan and Welebir (2003) model. Students are taken as an independent factor since its importance has been proposed many researchers (Chan and Welebir 2003; Totty and Grimes, 2001; Smith, et al., 2003; Volery and Lord, 2000, etc.).

Furthermore, students can shop around for the right mix of products and services from a growing number of

providers leading to the competition among providers. Chan and Welebir (2003) identify that the widespread access and availability of the internet provides the universities with a common base of delivery of education. However competition is then differentiated based on the content. The arrows signify the coming together of the different forces that result in the market rivalry of service provider institutions.

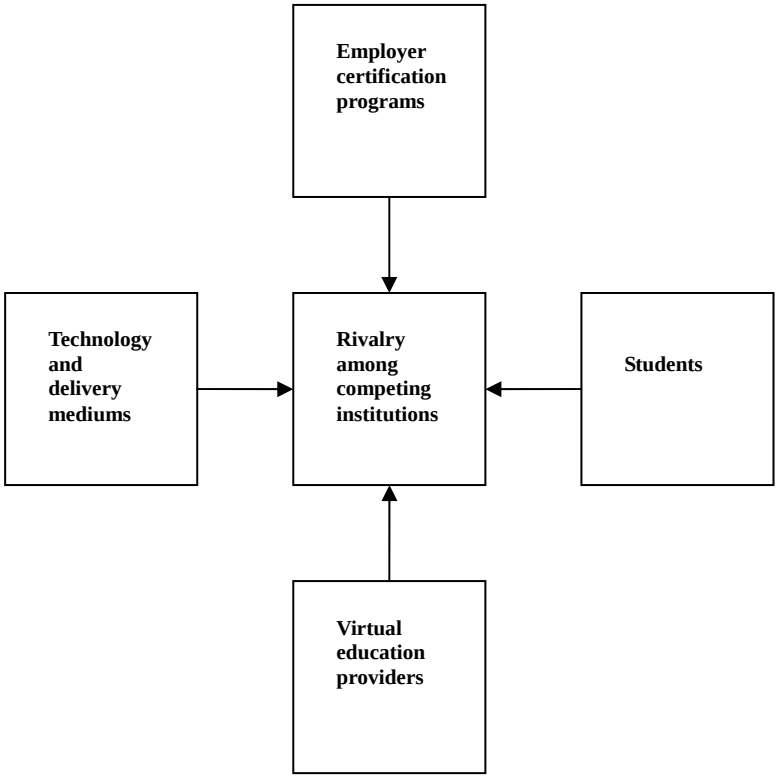

Figure 1. Adapted 5-forces model
Source: Chan and Welebir (2003)

Students

a. Technology issues for students

Technology issues can be an external as well as an internal factor, since the general IT infrastructure prevalent in the country would dictate flexibility of access of a student. Level of access is expressed through the students' selection of connectivity and browsers. McVay (2002) identifies three factors to be connected to student access to online education delivery:

- Connectivity speed,
- Connectivity providers
- Servers and browsers

Connectivity speed, while of no concern to an on-campus student can pose a problem for an off-campus distance-learning student. Also, the delivery mechanism of the course content has to be compatible with what the server platform is able to offer.

b. Student characteristics and performance

As maintained by Colley et al. (1994), such variables as prior experience, having a computer at home, and personality produce gender difference towards computers. Reinen and Plomp (1993) found that males in most of the 21 countries they surveyed dominated computer usage at school. Computer experience is another variable that can have an interaction with gender (Bussey, Bandura, 1992). In addition to gender, other demographic characteristics are likely to impact on the effectiveness of online delivery. Another demographic variable to be considered relates to the country of origin of the student (Volery and Lord, 2000).

Warner et al. (1998) proposed three important aspects related to students' readiness for online learning: (a) students' preferences for that form of delivery as opposed to face-to-face classroom instruction, or the provision of print-based pre-packaged resource materials; (b) student confidence in using electronic communication for learning and, in particular, competence and confidence in the use of Internet and computer-mediated communication; and (c) ability to engage in autonomous learning.

As a field of study, performance of students in online distance learning courses is still in its infancy, and a large portion of the studies focus on comparing online distance learning with traditional on-campus courses. Most of the research finds that participants in well-designed distance learning courses perform as well as those in well-designed traditional courses, and that students enjoy the online medium because they are provided with access to instruction that may otherwise not be available to them. One analysis of teaching methodology for online business courses found that faculty achieved considerable learning success by using a case study approach, because such approaches work well in the virtual classroom and move students away from dependent learning styles (Alstete and Beutell, 2004)

Experiences from the delivery of online courses and programs seem to suggest that current emphasis on technical electronic delivery mechanisms by many facilitators needs to shift to greater importance on support for student engagement, learning enhancement, and program execution by educational institutions today (Roffe, 2002; Alstete and Beutell, 2004)

c. Student satisfaction

Student satisfaction concerns satisfaction with course quality, with instructor interaction and peer collaboration, and with support services. Both asynchronous and synchronous interactions between students and instructors and amongst students are pivotal in virtual classrooms (NVCER, 2003b): Students are satisfied when program information and institutional services - including feedback, tutorials, learning resources, advising, mentoring, testing, readiness and career placement, grade and transfer credit and transcript reporting, degree conferrals, and technologies - are clear, responsive, timely, personalized, and easily accessible (Lorenzo and Moore, 2002).

As team projects and collaboration are a popular component of online assignments, measures to enhance effective communication between students become one of the key contributors to student satisfaction (Perreault *et al*., 2002). To measure student satisfaction, three important factors should be considered, namely, satisfaction with the delivery medium, satisfaction with the quality of the course, and satisfaction with the outcomes of learning. Finally, James-Gordon, Bal et al. (2003) divides the external factors affecting E-learning providers into market demand, political and legal forces, social and ethical forces, technology and competition. Some of these external factors (e.g. political, legal and social factors) must be measured, monitored and analyzed since they will influence the business.

FRAME OF REFERENCE

This section addresses the relevant variables identified from the literature review that founds the basis of our study.

Technology

The literature review part has allowed us to identify components in the technology issue that affect the success of online education. They are:

1. Reliability, quality and the medium richness (Sanders et al., 1995)
2. The perceived richness of the technology (Volery and Lord (2000), Daft and Lengal (1996)
3. Accessibility, which include:

- Affordable investment for users
- Universal access through ubiquitous technical infrastructure
- The quality of the interface
- Portal and server reliability, consistent look and feel of design; intuitive navigability; and clear information.
- Access to technical support services (online and in-person help)
- Skill to use computer and online technology

- Cost to use online service

(Trevitt, 1995; Cashion and Palmieri's, 2002; Lorenzo and Moore, 2002; Fulton, 2001)

Our observation is that though researchers may use different terms to describe their findings, most of opinions meet at one point. That is the accessibility that matters most in the success of delivery of online education. For example, what Sanders et al (1995) discussed about reliability and quality is also about the convenient remote access for students. The perceived richness of the technology Volery and Lord (2000), which is described as synchronous and asynchronous communication and supports a variety of didactical elements (texts, graphics, audio and video messages, is also about the accessibility issue (Daft and Lengal, 1996)

With this argument, it can be concluded that accessibility could be regarded as the main technological factor in the success of online education. We thus have a motivation to put our first research question about technology issue in the success of online education as follows:

RQ1: "How can accessibility factors that affect the delivery of online education offered by universities be described?"

The data collection will be framed to focus on following issues:

- The quality of the interface
- Portal and server reliability
- Affordable investment
- Access
- Technical support
- Skill to use computer and online technology
- Cost to use online service

Instructors

It has been argued the instructor plays a central role in the effectiveness of online delivery and that it is not technology (Collis, 1995). Webster and Hackely (1997) went further to suggest that three instructor characteristics influence learning outcomes:

- Attitude towards technology
- Teaching style; and
- Control of the technology

In this way, it may also be interesting to investigate into how the instructor affects the delivery of online education offered by universities. Our second research question will then be posed as:

RQ2: "How can instructor factors that affect the delivery of online education offered by universities be described?"

In details, we will look at three main issues:

- The skill of instructors to work with technology
- The interaction issue
- The issue of academic satisfaction

We also would like to know which approaches the faculty use to evaluate the work of online teachers. In details, is the traditional approach of counting student contact hours or any other ways used?

Competition

Michael Porter's five forces model as adapted by Chan and Welebir (2003) will be used to evaluate and explore the competitive forces at play. Our third research question will be posed as:

RQ3: "How can competitor factors that affect the delivery of online education offered by universities be

described?"

- Other universities with similar brand images within the geographic area
- Other universities with a higher brand image outside the geographic area
- Purely virtual education providers
- Other service firms offering similar products/ substitutes

Students

Student issue is important factor affecting delivery of online education since online education cannot exist without customer base. We consider those students characteristics perceived by instructors or education providers could be important issue to investigate on. Thus we motivate to use education providers' point of view regarding student issues and the forth research question is posed as:

RQ4: "How can student factors perceived by instructors that affect the delivery of online education offered by universities be described?"

- Technology issue for students
- Student characters and performance
- Student satisfaction

Summary of theoretical framework

Our starting point is divisions within a university (See Figure 1). We will only study the online distance education from that perspective. The internal factors influencing the online distance education we will look at are the technology (See RQ 1) and the instructor (See RQ2). The first external factor that is closest to the university is customers (See RQ 4), in this case as students. Since we are marketers we consider customers to be the most important factor of all. The arrows symbolises the fact that customers can move in either direction, either study at the University we have used for our case or they can choose one of the competitors instead. The second external factor we will look at is competitors (See RQ 3). In what way do they influence the online distance education? There are also other external factors like the technological infrastructure within the region which can be seen as belonging on a macro level. We have chosen to exclude those macro factors in order to have a realistic scope for our research.

METHODOLOGY

This study sought to explore and describe the e-readiness of universities in their bid to offer online education with purpose of being both descriptive and exploratory. . Two choices of research approach are available as qualitative and quantitative research approach. The research approach to this study is qualitative, given that the study is a relatively new branch of social science research (Churchill et al, 1998; Brockhaus, 1987; Bygrave, 1989) and the relative lack of understanding of this area.

The research strategy is suitable to be case study, which can be used for exploratory (what), descriptive (how) or explanatory (why) purposes (Yin, 1994). With the intent to be descriptive and also a theory building exercise, we opted for the multiple case study design. In proceeding with multiple case study, employing the model, the question of reductionism may be raised. However, the intent of the research is to investigate key factors stemming from a macro level model and judge their applicability on a micro level (divisional level). Thus, a generalization is not being attempted, nor is possible in a qualitative context (Neuman, 2003)

Using convenience sampling the samples were made at divisions of Luleå University of Technology (LTU). Selected cases were engaging in online distance education, and one was functional unit supporting online program/courses.

The multiple case studies were designed as a series of interviews. An interview guide using a set of open-ended and close-ended questions formulated the interview. Perry (1998) argues that probe questions about research issues must be prepared in case the interviewee does not raise them in the first, unstructured parts of the interview. Essentially these questions formed the basis of the interview guide:

- Initially gather information on the background of each division or department, its IT and staff competencies to handle online distance education
- Asked participants/respondents what factors facilitate online distance education.
- Asked respondents how internal and external factors affect delivery of online distance education.
- How could internal and external factors be utilised in gaining competitive advantage in online distance education?
- Re-examined our instrument on group members in order to make sure that all the issues had been corresponded to and addressed in our research questions.

Each interview was conducted face to faceand a tape recorder was used to accurately record and register the conversation. Notes were taken by one group member together with the recordings to facilitate crosschecking of information. Each interview period covered a period of approximately 90 minutes. All the respondents agreed to be taped and all interviews were conducted in English though we had Swedish respondents.

Construct validity deals with about the establishment of correct operational measures for the concepts being studied (Yin 1994, Rowley, 2002). In this study data collection methods were complemented with different kinds of materials whilst personal interviews were conducted by the researchers on responsible officers/respondents in the selected divisions in order to get the first hand information. To minimize errors, both respondents were carefully selected based on experience in online education and technical expertise.

External Validity establishes the domain to which a study's findings can be generalised (Yin 1994). Though, we used a multiple case study approach, the rationale behind our study is not to generalise our findings to all online education delivery in Sweden. The collected data were sent back to the respondents for interpretation check. The reliability might have been negatively affected by the fact that our respondents agreed to speak English and might have found it more difficult to prove their point.

DATA ANALYSIS

Case 1: Division of Software and System Science

Respondent: Alf Töyrä, Lecturer, Division of Software and System Science, Luleå Tekniska Universitet

RQ1 How can accessibility factors that affect the delivery of online education offered by universities be described?

The accessibility components are directly related to technology and the implementation of it. It appeared that there is no particular trait that clearly sets apart one software from another one in terms of quality; it was instead stressed that "how" the software is used is more important in providing quality. This may be due to the fact that with standardization and increased familiarity, the quality of the interface has become less relevant.

Other accessibility issues such as preserving a consistent look and feel, intuitive navigability and information clarity are dependent on the software platform of choice. But as has been mentioned before, there is an increased homogeneity in features offered among the software applications. This inevitably leads to a standardized interface along with improvements in navigability.

The only technical problem faced has been Internet downtime, which is an external factor over which there is no control. With improvements in networking, this also has a lot less impact in recent years. Förr i tiden! Contacts with the instructor can go a long way towards not only solving academic problems, but also any technical problems the student might be having.

Another feature that is unique to the web is most useful for receiving technical support. Since the softwares are inherently of the nature of an online forum (as well as being a repository for educational content), the learner has access to support not only from the instructor or the designated technical support personnel, but also from the other students/participants in the forum. This is where the core strength of this technical model lies; since most often any technical support questions can and are answered by one of his peers, i.e. another student. A successful adoption and further encouragement of this methodology in online education delivery can improve accessibility tremendously, and improve student involvement and consequently interest overall as a fallout effect.

While the online education delivery model bypasses the traditional 'confrontational' approach, yet as was

identified in our interview, the same phenomenon can occur in the online model also. However, here a student's voice may drown out in chat rooms by more experienced and 'pushy' students. To keep this at a minimum, real time chat is not preferred in interacting with the students, contrary to popular beliefs.

RQ2 How can instructor factors that affect the delivery of online education offered by universities be described?

An important response that arose out of our interview was that teachers "do not need special skills or a different mindset to be successful in teaching distant courses". The only difference perceived was that in the distant courses the teachers are not meeting the students personally. This finding is important, since it signifies the adoption of technology has reached a point of familiarity where other factors have become much less relevant in the quality of the education provided. It also signifies a degree of ease on the part of the instructor that can surely help facilitate the delivery process.

This ease of behavior is not just a product of increased familiarity and usage of technology but rather a result of the routines of becoming familiar. It emerged that the mission critical component in the whole process is planning. Since materials are prepared beforehand and the rest depends on communicating, it becomes an issue of planning skills on the part of the instructor; as well as an issue of his judgement regarding how frequently to communicate and with how many at a time.

The judgement factor is also crucial due to the fact that it is the experience of the instructor that ultimately determines which students may be more in need of help. As students grow more distant, successful online education initiatives would rely more on infusing the human touch, instructors with the sensitiveness and judgement to assess human feelings and reactions through a computer screen.

RQ3 How can competitor factors that affect the delivery of online education offered by universities be described?

Our results do not foresee competition from other universities partly because in Sweden the online educational efforts are executed and coordinated under an umbrella organization, the Swedish Net University (www.netuniversity.se). As a policy decision, this is in consistence with the Swedish social policy of education dissemination at all levels.

Thus, this marks a crucial departure from the standard educational organizational practices in other highly industrialized countries, such as the USA or the UK. While market forces fully govern the operations and directions of the Universities in the US, the United Kingdom while retaining a quasi-social aspect in education, is still steered by profit motives and market forces in higher education, and consequently in online delivery of education. Sweden, on the other hand, has prioritized the social benefit objective, and creation of the Net University is an extension of that objective and a result of a socio-political agenda. Then the question arises, since the Net University is based on co-operation among the Swedish Universities and complementing each other, it nullifies internal competition. Yet in case of online education delivery, external or international competition is a reality. It is also natural that now or in the near future Swedish Universities will have to compete with other international universities in trying to attract students.

It needs to be remembered that the application of five forces model in evaluating online education competitive forces in Sweden is limited. Instead, we may require a new framework that encompasses socio-economic variables and long term social and human gains to evaluate the effectiveness of the Swedish educational model.

RQ4 How can student factors perceived by instructors that affect the delivery of online education offered by universities be described?

With the use of the frame of reference, it was expounded that since computer usage at school is dominated by males (Reinen and Plomp, 1993) it is conceivable that male students may be more susceptible towards adoption of online learning.

In our interview the typical student profile taking a distance learning course was explained to be a female between the ages 30 and 40. This interesting finding from our interviews did not conform to some of the conclusions drawn by earlier researchers. It is difficult to interpret this phenomenon. We may hazard a conjecture that the phenomenon may have to do with the relatively high social status of the female in Sweden. Variables such as prior experience, familiarity with computers, personality that supposedly produces a gender difference

towards computers (Colley et al, 1994) also do not seem to have much influence in adoption of online education by the students. Instead, we see that the major motivations behind adoption by the students is their inability to engage in on campus education due to lack of time and other commitments, and self directed efforts at improving skills base.
Our interview also supports the conclusions reached by Leidner and Jarvenpaa (1995) who suggested that students lacking the necessary basic skills and self-discipline may do better in a traditionally delivered mode of education.

Case 2: Centre for Distance Learning

Respondent: Jan Nyström, Instructor, Center for Distance-spanning Technology, Luleå Tekniska Universitet

RQ1 How can accessibility factors that affect the delivery of online education offered by universities be described?

Accessibility problem has been addressed mainly by application service provider (ASP) who provides *Fronter* system in LTU. The data collection showed that the top management of the university has opted for one universal system (*Fronter*) in order to achieve integration among all learning system. This is found supported by the theory when it suggested that a universal access through the development of an accessible and affordable system (Volery and Lord, 2000).

As the popularity of broadband services in Sweden and the cost of the services are more and more decreasing, the requirement for investment to access online study for users pose no problem to the accessibility of users. The most reported problem is the firewall in the networking of some companies or organizations prevents users in the companies from accessibility. However, this problem can be seen as out of control of the online system administrators, thus is not discussed here.

RQ2 How can instructor factors that affect the delivery of online education offered by universities be described?

The rules that every instructor involving in online education must take course for basic knowledge of *Fronter* system by CDT can be seen as a good measurement to assure the quality of instructor for online education, at least in technical aspect. From this information, instructors of online education are able to perform basic troubleshooting tasks.

Regarding the issue of interaction with student in the process, the data collection showed that the view to this issue is quite positive. From the respondent's perspective, most of teachers believed that students have a tendency to interact more with teacher in online course than in campus-based course. The interview also revealed that teachers are more keen on pushing students to interact when in online than in traditional class room. The data collection also showed that there are no criteria in choosing instructors who develop online education courses from each division.

RQ3: "How can competitor factors that affect the delivery of online education offered by universities be described?"

Regarding universities with similar brand images outside Norrbotten, the data collection has found that there are 20 other universities providing the same online course. In order to have competitive advantage, online course providers need to have extra value or knowledge delivery to students.

Similar online course providers could be considered as cooperators rather than only the source of competition force. With one attribute of online education as time and place independent, similar online course providers could join together to design course and program in order to share both instructors and students and their knowledge. However, in Sweden with the existence of Net University provides a foundation to diminish rivalry and enhancing cooperations.

RQ4: "How can student factors perceived by instructors that affect the delivery of online education offered by universities be described?"

The accessibility is no problem with the Learning management system in regardless of students' selection of connectivity. Besides, IT infrastructure prevalent in Sweden is relatively good, which promise a basic level of access. Those findings were supported by McVay (2002) that technology issues can be an external as well as an internal factor, since the general IT infrastructure prevalent in the country would dictate flexibility of access of a student. Level of access is expressed through the students' selection of connectivity and browsers.

The data collections showed that usually there is no restriction for the number for the students in one course. But in order to achieve high course quality, class size is indeed a concern for computer-based real time communication.

Regarding students' characters in online courses, a demographic character reported by respondent that the profile of average student registered with the Net University of Sweden, is usually a woman and 37 years old. This group mainly has a job and a family to care about and hardly go to the campus. These findings provide some clues for target marketing yet the content of promotion is beyond our research.

Another interesting finding in respect to students' characters is that students in the chat room are more comfortable to raise their voice than in the traditional classroom. In respect to students' satisfaction and evaluation, instructors functions as valuable connection points with students and have therefore opportunities to reveal some important factors. First of all, in most of case, reported by respondent, online students commented that they have better communication with instructors in comparison with traditional campus course. But there is no measure for the quality control or results evaluation of online students compared to campus courses. We cannot access students' satisfaction in terms of course quality in this research yet instructors suppose that the skills students receiving from online courses are the same with that from campus courses.

CONCLUSIONS

The delivery of online education is becoming an increasingly popular alternative to traditional campus located education for universities. In our paper we have tried to address the issues of how the internal factors as accessibility and instructors and external factors as customers/students and competitors that affect the delivery of online education can be described.

We found evidences of the technology problem, especially accessibility in our cases, if encountered very minor. Accessibility is deemed crucial especially when it comes to providing a support infrastructure. Only a small concern is made by education providers that today's technology is highly advanced and perhaps beyond the requirements. At the same time most participants (e.g. Instructors and students) are getting increasing experienced, which put more pressure towards qualitative delivery capabilities.

Instead, as was evident from our study in both cases, the issue of technology has taken a back seat to human interaction issues in the context of online education delivery. Familiarity with technology in everyday life has extended itself enough so that intimidation in adopting a new method is no longer an issue of contention. Based on that, the influence of instructors and students on delivery of online courses can never be overemphasized. Instructors' motivation to offer quality online courses, students' preference and ability to conduct autonomous learning, and the interaction among all participants involved are more important factors revealed in our cases. There was no evidence found to show the need for any special skills on the part of the online instructor. However, we believe this issue merits further exploration to reach validity for our finding in this regard.

Finally one of the major findings in our research effort was the lack of fit in trying to apply the traditional competitive forces model in assessing both of two cases. We cannot generalize but at least the application of five forth model by Chan and Welebir (2003) is limited in evaluation the competitive force of online education, particularly in the Swedish context. A co-operative mode of providing educational services in Sweden precludes such market forces determination internally. Instead, a unified brand image is projected to gain competitive advantage in the external market.

Implications for future research

Part of the strength of any study lies in the recognition of its limitations. These limitations form directions for future research and point to theoretical implications. First of all, qualitative research as two case studies act more

as knowledge heuristic yet the emerged important factors need more quantitative approach to validate.

Second, in respect to students' satisfaction and evaluation of the online course, we did not collect data from student's perspective. This part of our research based on an assumption that instructors as the point of contact with students have the better chance to reveal important factors. This is a limitation when we want to investigate the students' issue, which should straight out in a future research from students' perspective.

We are confident in our belief that future developments in online education theory would need to focus more on human interaction through the electronic media rather than the underlying technology. Validating this claim would obviously require further research, and a broader sample base. It would also be interesting to explore whether the models of customer perception, expectation, and performance theories can also be applied in this context, regarding the students as customers for a service. Within the scope of our limited study, we also came upon the finding that there was no perceived need to put in place a specialized training program for the instructors to fit any special needs of students particular to online education. We believe further research would be justified to find out the validity of such an assumption; especially in the light of human interaction theories in an online setting.

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