October - 2002

Online Education Systems in Scandinavian and Australian Universities: A comparative study

Morten Flate Paulsen
NKI Distance Education
Norway

Abstract

This article presents a comparative study of online education systems in Norwegian, Swedish, and Australian universities. The online education systems discussed comprise content creation tools and systems for learning management, student management, and accounting. The author of this article arrives at the conclusion that there seems to be a general lack of integration between theses systems in all three countries. Further, there seems to be little focus on standards specifications such as IMS Global Learning Consortium (IMS) and Sharable Content Object Reference Model (SCORM) in higher education in all three countries. It was found that both Norway and Sweden value the importance of nationally developed learning management systems and student management systems; however, this does not seem to be the case in Australia. There also seems to be much more national coordination and governmental coercion concerning the choice of student management systems used in Sweden and Norway, than is the case in Australia. Finally, with regard to online education, the most striking difference between these three countries is that of economic policy. In Australia, education is considered an important export industry. In Norway and Sweden, however, the export of education does not seem to be an issue for public discussion.

Keywords: IMS: SCORM; learning management systems; student management systems; Australia; Norway

Introduction

This article was conceived during a two-week study tour of eight Australian universities in Queensland and New South Wales. It was later nurtured and developed further through literature studies, in-depth telephone interviews, and email correspondence with representatives from the universities and a number of other contacts. Of particular importance, was the email contact with National Council on Open and Distance Education (NCODE) – Flexible Learning Australasia (http://ncode.mq.edu.au), which helped me collect systems information from all Australian universities.

The Universities visited during the study tour were:

- University of Southern Queensland (USQ), Toowoomba, www.usq.edu.au
- University of Queensland (UQ), www.uq.edu.au
- Central Queensland University (CQU), www.cqu.edu.au/

- Griffith University (GU), Logan Campus, www.gu.edu.au/
- Charles Sturt University (CSU), www.csu.edu.au/
- University of Technology, Sydney (UTS), www.uts.edu.au/
- University of Wollongong (UW), www.uow.edu.au/
- James Cook University (JCU), Cairnes Campus, www.jcu.edu.au/

Thirty representatives from Norwegian and thirteen representatives from Swedish universities participated in this traveling seminar, and much time was spent discussing and reflecting upon differences and similarities between Norway's, Sweden's, and Australia's national educational systems. Many participants provided valuable input to this article both during and after the traveling seminar. The seminar was arranged by the University College of Lillehammer, which developed a website with information about the seminar and articles written by participants (australia.hil.no).

This article is also based on the author's research in the European Web-edu project (http://www.nettskolen.com/in_english/web_edu.html), which has conducted a number of regional analyses of European experiences with learning management systems. These analyses are based on more than 100 in-depth interviews with experts from 17 European countries. The regional analyses are being published at the website in Fall 2002. The website also provides definitions and discussions of terms used in this article (Paulsen 2002).

The author has written a book about online education from a Scandinavian perspective (Paulsen, 2001; 2002), and has some previous knowledge of Australian online education gained from his international analysis of online education (Paulsen, 2000) conducted by CISAER, a project supported by the European Leonardo da Vinci program, (www.nettskolen.com/in_english/cisaer/index.html). Knowledge about higher education in Australia is also based on the higher education report for the 2001-2003 triennium (DEST 2001).

Online Education Systems

The online education environment is discussed in this article from a systems perspective that comprises a chain of four systems as listed below and shown in Figure 1.

1. Content Creation Tools (CCT)
2. Learning Management Systems (LMS)
3. Student Management Systems (SMS)
4. Accounting Systems (AS)

Figure 1. The Chain of Online Education Systems
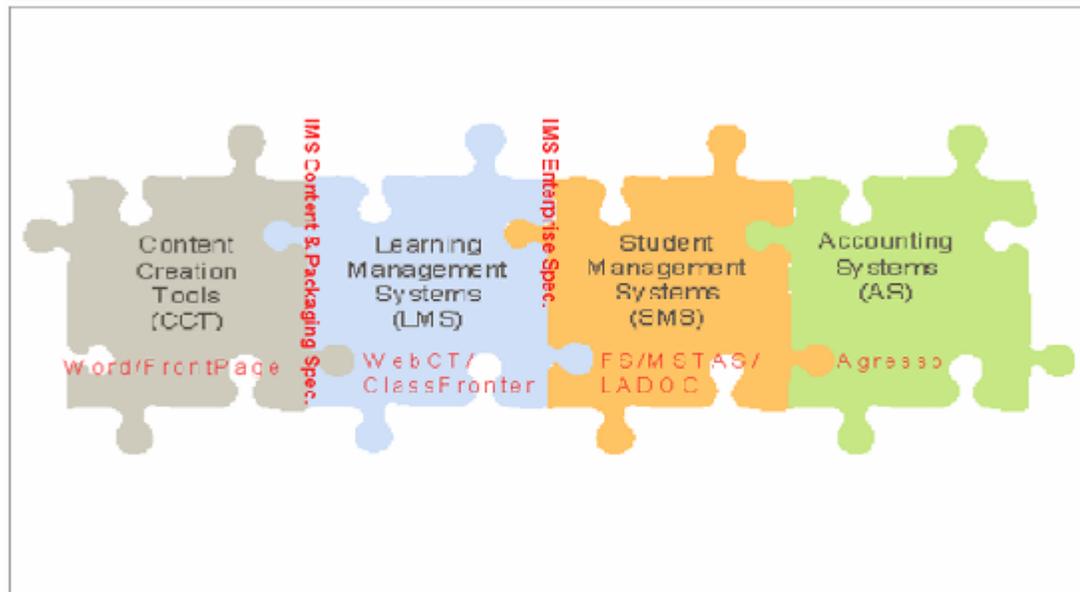
These online education systems are more or less integrated, in that they may overlap, exchange data, or work seamlessly together. So far, in most institutions high levels of integration among systems remains limited. In a discussion of integration between Learning Management Systems (LMS) systems, Student Management Systems (SMS) systems, and Accounting Systems (AS) systems in Norwegian higher education institutions, Runnestø and Ristesund (2002, 159) concluded that there is a general lack of integration between LMS systems and SMS systems.

There are several emerging specifications of standards, such as the IMS Global Learning Consortium (IMS) (www.imsproject.org) and Sharable Content Object Reference Model (SCORM) (www.adlnet.org/scorm/downloads.cfm), which may result in improved and easier integration between the four systems. However, the results of this article reveal that there is still little focus on standards in Australian, Norwegian, and Swedish higher education.

A compilation of the online education systems used by universities visited is presented in Figure 1. The author has not had the capacity at this time, to compile information about which CCT and AS systems the universities are using.

Table 1. Online education systems used by the Australian institutions visited

University	Learning Management System	Student Management Systems and other systems	Standards
University of Southern Queensland	*Blackboard, WebCT Vista*	*Peoplesoft Web-trends, Rightnow.com GOOD*	XML, IMS
University of Queensland	*WebCT*	*Peoplesoft*	
Central Queensland University	*WebCT*	*Peoplesoft*	
Griffith University	*Blackboard*	*Peoplesoft Self Developed (learning@GU)*	
Charles Stuart University	*In-house, Blackboard, WebCT*	*Banner*	
University of Technology – Sydney	*Blackboard, WebCT*	*Student One*	
University of Wollongong	*WebCT*	*In-house LOL*	IMS
James Cook University	*Blackboard*	*In-house (studentsonline)*	

In the following, each of the four categories of online education systems is discussed with particular focus paid to systems integration and national differences.

Content Creation Tools

Content creation tools (CCT) are used to develop learning material. Typical examples of such CCT systems are *DreamWeaver, Frontpage, Word, PowerPoint,* and *Director.* These are generic CCT systems with few features developed specially for online education. There are probably few national differences with regard to educational use of these CCT systems. Because there are many types of content such as, for example, plain text, slides, graphics, pictures, animations, audio, video etc., it is likely that institutions will need several CCTs. Moreover, it is unlikely that a single LMS system could meet all the needs for content creation.

Integration between CCT and LMS Systems

Growing focus on standards, such as IMS and SCORM, may provide greater exchangeability of content between LMS systems. For example, *The IMS Content and Packaging Specification* will make it easier to create reusable content objects useful in a variety of learning systems. However, one should also take note that these are "specifications" rather than "standards." As such, specifications are still developing and have not yet been ratified by any international standards-accrediting agencies. *BlackBoard* and *WebCT*, for instance, are partnering with IMS to develop and support such specifications.

It is also worthwhile to note, some LMS systems provide more or less advanced features for content creation. Creation of quizzes, multiple-choice assignments etc., are often handled more efficiently by LMS systems than by generic CCT systems. There are also specific content creation tools for creation of tests, and as such, *The IMS Question Test Specification* addresses the need to share test items and other assessment tools across different systems. Finally, one should also be aware that LMS systems might require templates and provide publishing features that may support or complicate the integration of CCT and LMS systems.

Learning Management Systems

In Australia, *WebCT* is perhaps the most widespread LMS system, with *Blackboard* ranking second. An NCODE-FLA (2002) LMS survey (http://ncode.mq.edu.au) of 34 Australian institutions showed 24 instances of *WebCT* use, 12 instances of *BlackBoard* use*,* and six instances of in-house developed LMS systems. This finding is supported by brief on leading learning platforms (The Observatory on Borderless Higher Education, 2002), which shows that Australia holds the highest penetration of *BlackBoard* and *WebCT*, with 76 percent of the country's 34 universities licensing such LMS systems.

Among the Australian universities visited, *WebCT* is used at USQ, UQ, CQU, CSU, UTS, and UW; whereas *Blackboard* is used by USQ, GU, CSU, UTS, and JCU. The tour indicated that the gross figures would need to be closely examined to determine the level at which each application was used on both a subject and department level, as compared to an enterprise level.

In a personal email, one manager at Charles Stuart University (CSU) Online reported that *WebCT* is the most commonly LMS in Australia, but that *Blackboard* is used in the majority of enterprise installations. He further stated there are many stand-alone LMS installations used throughout Australia, and that such systems will never integrate with enterprise systems. These stand-alone systems are consistently counted in raw survey data, but one must question if they should be counted equally.

Charles Stuart University's Online manager also reported using an in-house developed LMS, as well they were just beginning a trial of *Blackboard.* Having used *WebCT* in the past for various small projects, CSU recently made the decision to switch from *WebCT* to *BlackBoard* after a long, democratic process of discussion.

University of Southern Queensland (USQ) has recently decided to use *WebCT Vista*, which was released in Australia in March 2002. USQ will use *WebCT Vista* for local and domestic students, but also continue to use *Blackboard* for *USQOnline* in conjunction with their commercial partner, *NextEd*. Their intention is to manage the transition to both LMS platforms from *GOOD* via the IMS specification.

Table 2. Number of LMS systems in Australia's 34 universities (NCODE-FLA, 2002)

LMS	"N"
WebCT	24
BlackBoard	12
In-house	6
TopClass	3
WebMentor	1
FirstClass	1
Callista	1
Lotus Learning Space	1

The NCODE survey (2002) showed that *BlackBoard* was the only LMS supported centrally at Edit Cowan University (ECU). However, they have previously used both

WebCT and a system developed in-house. Further details from ECU are available in a case study (The Observatory on Borderless Higher Education, 2002).

It is interesting to note the dominance of commercial North American systems in Australia. Although there is an overall lack of Australian-developed systems on a commercial level, there are some systems developed in-house. This raises some concerns in Australia, in that the two major LMS players have the market "stitched," meaning that the systems are embedded in the operational culture of Australia's higher education institutions and that uncompetitive pricing structures could evolve.

An analysis of LMS systems in the Nordic countries (Paulsen 2002) states that Nordic institutions tend to prefer LMS systems developed in Nordic countries. Among the 25 different LMS systems identified in the analysis, 16 were of Nordic origin. All other systems were of American, Canadian, or Irish origin. The analysis further indicated that *ClassFronter*, *WebCT*, *FirstClass*, and *BlackBoard* are the most commonly used LMS systems in the Nordic countries.

In Norwegian higher education, the dominant system in use is the Norwegian developed system *ClassFronter* (www.fronter.com), while some colleges use standard commercial systems, and others have developed their systems in-house. Of Norway's 54 universities and colleges, 32 offer online education Runnestø and Ristesund (2002, p. 36). As shown in Table 3, several Norwegian universities use more than one system.

Table 3. Number of Learning Management Systems used in 54 Norwegian institutions of higher education (Source: Runnestø and Ristesund, 2002)

Learning Management System	"N"
ClassFronter	21
Developed In-house	9
LUVIT	6
IT's Learning	4
First Class	3
Kark	3
WebCT	3
BlackBoard	2
TopClass	1
Lotus Learning Space	1
TeamWave	1
Response	1

Norwegian institutions emphasize the importance of using Norwegian developed systems that are responsive to informational and feedback needs specific to Norwegian institutions.

In Swedish universities and colleges, no one system seems to be dominant, but a number of standard commercial systems are used. According to personal email correspondence with one of Sweden's leading experts on LMS systems, Fredrik Rexhammar (March 18, 2002), *Luvit* (www.luvit.com), *Lecando, Infinity*, *Grade, Platon,* and *Web Academy*, are the current Swedish-providers of LMS systems. Rexhammar also stated that *WebCT* and *Blackboard* are the most common foreign LMS systems currently used in Sweden. In addition, the Swedish-developed system *PingPong* (www.partitur.se), is also used by some institutions. The following systems are listed in a market overview of LMS systems

(www.ssv.gov.se/avit/pform2.htm): *Luvit, Mentor, Telia Instant Education, Maestro, FirstClass*, *Comenius Online, Lecando, Librix, Marratech, PingPong, Surfa och lär*, and *WebCat.*

Integration between LMS and SMS Systems

For historical, legal, and financial reasons, SMS systems tend to be more important than LMS systems. This is because the SMS usually serves as the "master system" from which the LMS accesses and draws necessary data. As a result, integration between SMS and LMS systems tend to vary in sophistication. One may distinguish between the following four levels of integration:

> 1. Both systems access the same database. However, since few existing systems were originally designed with integration and security in mind, high levels of integration may be difficult to achieve.

> 2. Both systems have separate databases, but the data are frequently updated and exchanged in a synchronized manner, for example during a daily batch process.

> 3. Data are frequently transferred one way, from the SMS database to the LMS database, for example during a daily batch process.

> 4. Data is transferred from the SMS database to the LMS database at the beginning of each semester when students are registered in the SMS. This process may be handled manually.

IMS, SCORM, and other specifications, may facilitate data exchange, thereby making it easier for institutions to substitute one system with another. Hence, these specifications may make institutions less dependent on the system providers. For example, *The IMS Enterprise Specification* is aimed at administrative applications and services that need to share data about students, courses, and performance across platforms, operating systems, and user interfaces. Similarly, *The IMS Learner Profiles Specification* describes ways to organize student information, so the systems can be more responsive to the specific needs of each user.

One faculty member at Central Queensland University (CQU) reported in a personal email, that an IMS consultant recently claimed that *WebCT, Blackboard* and *PeopleSoft* had agreed on IMS interoperability specifications, presumably for future releases.

Runnestø and Ristesund (2002, p. 159) pointed out that they found a general lack of integration between LMS system and SMS systems in Norwegian colleges and universities. Awareness of this "lack of integration" is, however, increasing in both Australia and Scandinavia. In the NCODE-FLA survey (2002), 11 Australian universities reported varying levels of integration as shown in the quotes below:

- University of Adelaide has achieved full integration with *PeopleSoft,* employing nightly updates for staff and student details

- Deakin University uses *Callista* as its student record system and *Concept* is its human resource system. Both systems are integrated with *TopClass*, with a fairly administrative-intensive transfer of records between *FirstClass* and the corporate administrative applications. There is no link with *WebCT.*

- Edith Cowan University uses a homegrown records system and enrolment system; however, these systems will be replaced by *Callista* in the future. The human system currently in use is *Concept*, and *Blackboard* is integrated with the existing student and human resources systems.

- Griffiths University uses *PeopleSoft*, which is fully integrated with its other systems.

- James Cook University has achieved integration with its *JCU web*, whereas purpose built *StudentsOnline* and *StaffOnline* systems work remains ongoing.

- Northern Territory University is currently using *ASCOL* student administration system and developing *Callista TAFE* version. When development is completed, *Callista* will be implemented university wide. Integration with other systems is planned to occur as *Callista* is implemented.

- The University of Melbourne uses a homegrown student administration system, *Merlin*, and human resources system *Genesys*, which are integrated with its LMS, *WebRaft*. *WebRaft* is integrated with the Melbourne University's email system.

- The University of New England uses *Banner Student* and *Concept*, which are both highly integrated using *API* with *Banner* and username and password systems.

- The University of the Sunshine Coast uses *PeopleSoft* for student administration, finance, human resources, and payroll. In its recent LMS tender, they are looking for integration with its PS systems.

- The University of Tasmania is in the market for a new student system: *Concept and HRMS*. Both are to be integrated with *WebCT*.

- The University of Western Sydney is using *Concept* for staff administration, alongside an in-house student administration system, *SRS*. These systems are only minimally and variously integrated with current LMS systems in use. *Callista* is slated to be implemented mid-2002, with the goal of developing gradual interoperability within an integrated system.

Student Management Systems

There seems to be more national coordination and/or governmental coercion in terms of choice of SMS systems used in Scandinavia, than is the case in Australia. Many SMS systems used in Australia were developed in North America such as: *PeopleSoft* (CQU, GU), *Banner* (CSU), and *Student One* (UTS). However, other universities like University of Wollongong (UW) and James Cook University (JCU), for example, have developed in-house systems, and therefore changing to a commercial system appears to be a major economic obstacle.

The NCODE-FLA survey (2002) provided information about the SMS-systems used by 21 of Australia's 34 universities. This survey indicates that *PeopleSoft* is the most widely used commercial SMS system in Australia. It also shows that *Callista* is also widely used and that a number of institutions plan to switch, or are in the process of switching, to *Callista*. This survey also supports my impression that several universities have chosen to

develop their systems in-house. It must be noted, that a relatively large range of other systems are also mentioned in the survey.

Table 4. Numbers of SMS systems used in Australia's 34 universities (NCODE-FLA, 2002)

Student Management Systems	"N"
PeopleSoft	8
Callista	6
In-house developed system	5

In Norway, two student management systems dominate the higher education market: *Felles System* (http://www.fs.usit.uio.no/) used by most universities, and *MSTAS* (http://www.enet.no/) used by most colleges. However, it must be emphasized that the two largest private colleges have chosen alternative solutions: The Norwegian School of Management uses *Banner* and NKI has developed its own in-house system, *STAS*.

The following short presentation of *Felles System* was published at www.fs.usit.uio.no/fs-english.html on February 15, 2002:

Felles System is a computer-based student administrative system developed for universities and colleges in Norway. The following institutions are using *Felles System*: (The year when they started to use *Felles System* is in brackets):

- Universities: NTNU (1997), UiB (1996), UiO (1996), UiTø (1996)

- University colleges: AHO (1997), NHH (1997), NLH(1997)

- State colleges: HiA (1999), HiB (1998), HiBu (1999), HiO (1999), HiS (1998), HiST (1999), HiTø (1998), HSH (1999), MF (1998), NMH (2001), KHiB (2001)

Adoption of the *Felles* System was financed by the Norwegian Ministry of Education and Research, and all publicly financed educational institutions that wish to use *Felles System* have access to it. Costs of maintenance and further development are shared among user institutions. This system has the following features:

- Persons (applicants, students, faculty members, lecturers, and letter and address solutions)

- Application and admission procedures

- Courses, subjects, programs of study, requirements and regulations

- Eligibility of admission, classes, leave of absence

- Term registration

- Payments (fees for study and exams, reports to financial systems)

- Lectures (planning, publishing, student administration)

- Exams (planning and student administration)

- Qualifications (awarding of degrees and diplomas)

- Master and PhD (admission and student administration)

- Further and continuing education

- Applications for recognition of foreign or external credentials
- Scholarships (application and awarding)

- Mobility students

- Reports to the Ministry of Education and Research, State Educational Loan Fund, Statistics Norway and others (www.fs.usit.uio.no/fs-english.html)

All Swedish Universities use *LADOK* or *LADOK NOVAU*, owned by a consortium of 37 Swedish higher education institutions. Information about the *LADOK* consortium is available at http://www.ladok.umu.se/. *LADOK* is a computer-based student admission and documentation system for a university or university college. It focuses on administration of undergraduate and graduate studies. The system is locally deployed and managed by the institutions.

The *LADOK* system has a "mutual core," identical to all *LADOK* system installations in Sweden. This "mutual core" consists of a structure of database tables and computer programs. Every institution decides which parts of the "mutual core" it wishes to use. It is also possible to use locally developed addendums. In essence, the *LADOK* system can be viewed as a large "smorgasbord" from which the institution can pick-and-choose which parts it needs to use.

The *LADOK* system consists of two major parts: the admission system, and the documentation system. They are integrated and share data – e.g., name, address, and other facts about applicants and students. A third part, handling documentation of graduate students, has been added to the *LADOK* system's "mutual core." Undergraduate studies are handled in terms of single courses and programs of study usually totaling three or four years in length. System files contain information for student identification, general eligibility for university studies, admission to courses and study programs, registration in courses per semester, course data, credit points from courses, degrees awarded, and international studies.

The *LADOK* system mainly focuses on student admission and documentation, planning and follow-up. This system was designed for use in all Swedish state financed institutions of higher education. Users of the *LADOK* system at an institution can be found at all levels:

- University board and administration Faculty or school heads

- Departments

- Students

Data from *LADOK* are exported to the Ministry of Education and other agencies for follow-up purposes. An important objective of *LADOK* is to prepare and generate the annual invoice to the government for institutional level undergraduate studies. Although the *LADOK* system is owned by a consortium of 37 Swedish higher education

institutions, maintenance for the *LADOK* system "mutual core" is the responsibility of a maintenance group at the University of Umeà. Local system usage is the responsibility of individual institutions, including payment for servers, networking, terminal equipment, and local support.

Integration between LMS, SMS, and AS Systems

Most institutions have relied on accounting systems for many years. Although AS systems were not developed for integration with LMS systems in mind, they are often part of, or minimally integrated with, a university's SMS systems. So far, the integration between the LMS and AS systems has not attracted much attention. As online education generates more income for institutions, it is likely that increased levels of systems integration will become more important. Some institutions already accept that online enrollment, payment, and student credit account information must become more central.

Accounting Systems

In contrast to Australia, which enjoys a long history of serving tuition-paying students, Sweden does not accept any tuition fees from its students. In recent years, however, Norwegian universities and colleges have begun charging its students tuition for further- and continuing education courses. These national differences are significant, in that both countries have developed different incentives for the development of online education and the integration of their AS systems with their SMS and LMS systems.

The accounting systems used in Australian systems are integrated functionally with the SMS or LMS systems. This seems to be the situation for the *SMS* systems: *PeopleSoft* and *Student One*. Similarly, *Banner* is an integrated accounting system used in the LMS system *BlackBoard*. In contrast, a separate accounting system named *Agresso* (www.agresso.com) seems to be dominant in both Norway and Sweden.

Discussion and Conclusions

In comparing online education systems in Australia, Norway, and Sweden, several important issues become apparent. The most prominent finding facing all three countries is the general lack of integration between content creation tools, learning management systems, student management systems, and accounting systems. To overcome these shortcomings, many institutions have recently initiated efforts to improve overall systems integration. It is hypothesized that those institutions that implement seamlessly integrated systems, will likely improve their chances of becoming successful, large-scale online education providers.

In all three countries, little attention has been paid to adherence to such standard as the IMS and SCORM specifications in higher education. This may stem from institutions' limited knowledge about such specifications, skepticism about the sustainability of specifications, general resistance to standards that seemingly limit individual freedom, and/or a conscious decision that adoption of such specifications are not important enough to justify cost and resource expenditures. Barron (2001) discusses some of these issues in detail.

Norway and Sweden tend to prefer nationally developed LMS and SMS systems. On the other hand, Australian institutions tend to prefer using commercially produced systems.

This difference may reflect language issues, but it may also stem from pedagogical traditions and other cultural factors.

In terms of choosing of SMS systems, higher levels of national coordination and/or governmental coercion is more evident in Scandinavia than it is in Australia. Many of SMS systems used in Australia were developed in North America. However, two Norwegian systems and one Swedish system completely dominate in the Scandinavian countries, which may possibly result in future collaboration among the Scandinavian universities, over that of Australian universities.

As compared to Norwegian and Swedish universities, Australian universities regard online education as a source of income. This difference may account for greater awareness in Australia of the necessity of integration among AS, LMS, and SMS systems. The most striking difference between the three countries with regard to online education is related to economic policy. In Australia, distance education is viewed as one of the country's most important export industries. The education and training action plan for the information economy from the Commonwealth Government (DEST 2000) clearly states: "Education in Australia is a multi-billion dollar export industry of vital importance to our economy." However, in Scandinavia, export of education does not even seem to be an issue for public discussion.

Australia can benefit by having English as its first language. In contrast, Norwegian and Swedish are home to minority languages, and this fact alone may be one reason that higher education institutions in Norway and Sweden appear to be much less interested in exporting online education to other countries, as compared to their Australian counterparts.

In Scandinavia, education is traditionally perceived as a public service that should be available free of charge. Although there is increasing acceptance for commercialization of education, Swedish universities, are not allowed to charge its students tuition fees. In comparison, Norwegian universities and colleges are now obliged to charge tuition fees for further and continuing education – educational initiatives that in recent years has become the most dynamic and innovative sector of education in Norway. Since Sweden lacks this economic incentive for change, the country will likely face future difficulties when competing with online education in other countries.

On balance, online education appears to be less developed in Sweden than it is in Australia and Norway. This may be partly due to the lack of economic incentives to offer online programs as a source of extra income. It may also be due to the fact that governmental online education initiatives tend to be imposed, and often without local institutional support. One such example is three Swedish distance education consortia, which have received considerable governmental funding since 1993-94 (Hillefors et al, p. 22; Ranebo, 2001). At its peak, these three consortia offered from 40 to 50 courses, to 5,000 to 6,000 students (Hillefors et al., p. 26). After nearly ten years of unimpressive results, funding is to be discontinued. To replace these consortia, the Swedish government has recently established *Nätuniversitetet* (http://www.netuniversity.se), a new national body to fund and coordinate Sweden's distance education activities. In 2002, *Nätuniversitetet* will provide financial funding for the equivalent of 2,350 full-time students at 30 Swedish higher institutions.

Norwegian institutions typically charge students 3000 to 4000 euro dollars for online courses, equivalent to one-year full-time study. In contrast, for the year 2002, Swedish universities will receive 12,000 euro dollars in governmental funding from

Nätuniversitetet for similar online courses of equivalent length. This is about three times more funding than Swedish universities receive for an on-campus student engaged in full time studies. Such lavish funding is probably intended to increase the development of online courses. However, it could also easily set a standard for future costs of online education courses. In the view of this author, the Swedish approach is unwise, as it not cost effective and could set an unhealthy precedent for future overspending.

References

Barron, T. (2001). Standards: The Vision and the Hype. *American Society for Training & Development (ASTD)*. Retrieved October 3, 2002 from: www.learningcircuits.org/nov2000/standards.html

DEST (2000). *Learning for the knowledge society. An education and training action plan for the information economy.* Retrieved October 3, 2002 from: www.dest.gov.au/schools/Publications/2000/learning.htm

DEST (2001). *Higher education report for the 2001-2003 triennium.* Retrieved October 3, 2002 from: www.detya.gov.au/highered/he_report/2001_2003/html/1.htm

Hillefors, L., Myringer B., Svanteson B., Rathsman I., and Gisselberg M. (2001). *Ett Nätuniversitet för livslàngt lärande och kompetensutveckling*. Rapport fràn en utredning utförd pà uppdrag av styrelserna för Distanskonsortiet, Svenska Distanshögskolan ock Västsvenska konsortiet för flexibelt lärande.

NCODE-FLA (2002). Retrieved October 3, 2002 from: http://ncode.mq.edu.au/papers/lmsSurvey.doc

Observatory on Borderless Higher Education, (2002). Leading Learning Platforms: International market presence. *Observatory on Borderless Higher Education 2.* Retrieved October 3, 2002 from: www.obhe.ac.uk/products/briefings/pdfs/LearningPlatforms.pdf

Observatory on Borderless Higher Education (2002). Concise Case Study: Learning platforms. *Observatory on Borderless Higher Education 2.* Implementation of a Learning Platform at Edith Cowan University, Australia. Retrieved October 3, 2002 from: www.obhe.ac.uk/products/briefings/pdfs/LearningPlatforms.pdf

Paulsen, M. F. (2002). An Analysis of Online Education and Learning Management Systems in the Nordic Countries. *Online Journal of Distance Learning Administration 5*(3). Retrieved October 3, 2002 from: http://www.westga.edu/%7Edistance/ojdla/fall53/paulsen53.html

Paulsen, M. F. 2002. *Nettbasert utdanning – erfaringer og visjoner. København: Gyldendal.* Retrieved October 3, 2002 from: www.nettskolen.dk/nettskolen/bok

Paulsen, M. F. (2002). *Online Education Systems: Discussion and definition of terms.* Retrieved October 3, 2002 from: http://www.nettskolen.com/forskning/Definition%20of%20Terms.pdf

Paulsen, M. F. (2001). *Nettbasert utdanning – erfaringer og visjoner.* Oslo: NKI
    Forlaget. Retrieved October 3, 2002 from:
    www.nkiforlaget.no/forlaget/html/utdrag/nettbasert.htm

Paulsen, M. F. (2000). *Online Education: An international analysis of Web-based
    education and strategic recommendations for decision makers.* Oslo: NKI
    Forlaget.

Ranebo, S. (2001). *Nordisk kartlägging av nationella initiativ rörande utvecklingen av
    Virtuella universitet. Nordiska ministerrådets IT-policygrupp.* Retrieved October
    3, 2002 from: www.yh.aland.fi/dokument/IT_P_VU_rapport_Final.pdf

Runnestø, R., and Ristesund G. (2002). *Experiences with Learning Management Systems
    in Norwegian Universities and Colleges.* Retrieved October 3, 2002 from:
    http://www.nettskolen.com/forskning/Diploma%20project.pdf

Athabasca
University