

COMPREHENSIVE ANALYSIS OF EXISTING LEARNING MANAGEMENT SYSTEMS (LMSs)

Status: Accepted by Lisbeth Juel Andersen, May 29, 2002.

Name of institution	Aalborg University The Centre for the Interdisciplinary Study of Learning (VCL)
Type of institution:	University University Centre
Address:	
Telephone	
Fax	
Email	
URL	http://www.vcl.auc.dk/default-engelsk.htm
Name of training manager:(Optional)	Lisbeth Juel Andersen, Systems administrator lisbeth@hum.auc.dk http://www.musik.auc.dk/%7EElisbeth/ Helle Bækkelund Jensen [helleb@vcl.auc.dk] http://www.vcl.auc.dk/Om%20VCL/ansatte/helle_baekkelund/master.htm
LMS used	FirstClass
URL of LMS	www.firstclass.com or www.centernity.com The Danish distributor is Micrograf.
Language of LMS	We use the English language version. There is a Danish version, but the latest updates are later available in Danish.
Number of years in use	FC since 1994
Other LMSs used	Virtual-U, since 1997
Number of students in the system	770 distance education students use FC 110 distance education students use VU These numbers include the tutors. In addition, traditional face-to-face students use FC.
Number of courses available	We offer a number of higher education programs. Each program comprises a number of courses or modules. We offer 10 distance education programs via FC and 1 via VU. The higher education programs have individual needs and the departments are free to decide which of the two LMS systems they want to use. I think this is a wise strategy and it is OK to run two different systems. But we don't have the resources and capacity to run additional LMS systems.
Typical duration	Our courses en programs follow the traditional school year.

Number of tutors in the system	FC 110 VU 10-12
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This analysis is divided into six parts.

1 Course development tools

2 Student support tools

3 Tutor support tools

4 Administration (student database and records)

5 Technology (quality of software)

6 Price

1 Course development tools

Helle Bekkelund could provide more information about course development.

1.1 Course creation. How satisfactory was the LMS for course creation?

Usually, several teachers collaborate on the course development.
[Aalborg]

1.2 Structure and didactic flexibility - openness. In the creation of course materials did the LMS permit didactic flexibility? Was the structure open to differing didactic possibilities?

1.3 Teacher user friendliness. How easy was the LMS to use by teachers and course developers?

1.4 Support for graphics, audio and video, moving image. Did the LMS support the provision of graphical materials, moving images, audio and video in the course content?

1.5 Questioning, assessment, assignments. What provision was made by the LMS for student questioning and assessment and the design of student assignments?

2 Student support tools

2.1 Interactivity possibilities. What provision does the LMS make for student interaction?

FC is more advanced than VU with regard to communication services and features. Neither of them can integrate video. FC can simulate a whiteboard function. FC provides a built in e-mail service. [Aalborg]

FC provides a user history function that is much used. It tracks and presents information on what each individual user have done online. This information is also available to the students. [Aalborg]

2.2 *Online student-to-student communication (synchronous and asynchronous).* What facilities does the LMS provide for student communication to other students and how successful is it? Is both synchronous and asynchronous communication between students supported?

Both FC and VU provide chat, which is gaining popularity. The students use chatting for formal project meetings, which they set up and organize themselves. One nice feature is that the minutes from the meetings are automatically recorded by the system. [Aalborg]

2.3 *Online student to tutor/institution communication (synchronous and asynchronous).* What facilities does the LMS provide for student communication to the tutor ion to the institution's administration and how successful is it? Is both synchronous and asynchronous communication supported? Are these support services available 24 hours a day?

Student-to-tutor communication is primarily conducted via the e-mail function in FC. It is however possible to form conferences for a tutor and a group of students. Both FC and VU allow students to establish such conferences. These conferences are used for communication between a tutor and a group of students. [Aalborg]

2.4 *Resources, library, references.* What facilities does the LMS provide for student acquisition of resources required by the course, especially library resources and references to required readings?

2.5 *Feedback on work and assignments.* What is the quality of provision of feedback to students on their work and assignments?

VU makes it possible to establish a special mailbox for submission of assignments. It also provides a built-in system for evaluation of assignments, but we don't use it. FC does not provide such features. [Aalborg]

3 Tutor Support tools

3.1 *Tracking students - database questions.* How user friendly is the LMS for tutors wishing to track their group(s) of students and retrieve data from the student database?

FC is better than VU with regard to tutor support tools. Everybody, also the students, have access to the user history data. Some students express apprehensiveness against being monitored when they hear that their online movements are tracked. But they become very positive when they see how useful this feature is. For example, they find it very useful to see who have opened a document that should be discussed. [Aalborg]

3.2 *Group management tools.* What facilities are provided by the LMS to the tutors for managing their group(s) of students?

The students may establish private calendars and group calendars in FC. There they can register deadlines for submission and group activities. The private calendars can be synchronized with the group calendar. The calendar functions are much used and perceived as useful. [Aalborg]

3.3 *Preparation of questions and assignments by tutor.* How successful is the LMS in providing tutors with user friendly and didactically successful tools for the design of student questions and assignments?

Neither FC, nor VU provide this, and I have not heard that the tutors express the need for it. [Aalborg]

3.4 *Course planning for students (monitoring pace).* What tools are provided by the LMS to tutors to enable them to monitor and plan student progress?

3.5 *User-friendly administrative systems between tutor and institution.* What provision does the LMS make for successful tutor to institution communication?

We have many external tutors, but we do not provide any special online features or services for them. VU has a built in, online tutorial for tutors. We offer a one-day, face-to-face course and some Danish manuals for the tutors. This is sufficient teacher training. [Aalborg]

4 Administration (student database and records)

4.1 *Enrolment procedures and fee paying.* What facilities does the LMS provide for student enrolments, course allocations and payment of fees?

The open education office handles enrolment centrally. There they register all necessary student information into STADS. Later, we can extract information from STADS and import it into the LMS. I don't know procedures for tuition payment, but STADS provides information about the students' payment status. That means that we don't issue passwords and userIDs to non-paying students. [Aalborg]

4.2 *Passwords and security.* How successfully does the LMS handle student access to the system and the security of all student interactions with the system?

A separate software program generates passwords. Then they are personally handed over to the student at a face-to-face start up session. All courses have such start-up sessions. Usually we also arrange face-to-face seminars one or two times per semester. If the students forget their passwords, they have to contact the systems administrator who manually generates a new password. This doesn't create much work. [Aalborg]

4.3 *Student records database.* How successful is the system's student database, especially for data storage and data retrieval.

There is no integration between our student administrative system (STADS) and the LMS systems. STADS records information about the students names, addresses, the programs they are enrolled in, which courses they have finished, their grades, their payment status etc. We have developed a program that extracts some data from STADS to a computer file, which we then can import to FC. At the moment, this is harder to do with VU, but we can develop this functionality since we have all the VU source code. [Aalborg]

4.4 Examination and certification records. What structures are provided for recording of data and results leading to examination and certification?

4.5 Course, class and tutors database. What facilities are provided for administration of courses, classes and tutors?

Neither FC, nor VU are good with regard to finding information and providing services on the level above individual courses. It would be nice to get a better overview of how many online teachers and courses we have in the system. One needs extensive system knowledge to find such top-level information. FC is however somewhat better than VU with regard to this. [Aalborg]

5 Technology (quality of software)

5.1 Server - hardware and software options. What is the quality of server hardware and software options? How is the system integrated with existing software?

Our ICT centre operates both LMS systems at local servers. This works well. We experience that both systems are very stable and reliable. [Aalborg]

VU is based on an Open Source policy. I really support this strategy. It is useful to be able to share code with other institutions and it is especially useful when we search for errors. [Aalborg]

5.2 Client - hardware and software options. What is the quality of client hardware and software options? Does the system permit metatagging?

FC has separate user client software that we recommend students to install. We don't experience much difficulty with this, neither with logistics nor with student support. The client offers better overview of the FC services and improved response time. [Aalborg]

5.3 Flexibility of didactic structure; updating, adaptability. Is the didactic structure flexible or is it determined by the technology? How adaptable is the technology to updates and to new technology that becomes available to the market?

As far as I know, we haven't got any policy on e-learning standards. I don't perceive that this as an important issue in Danish higher education. I must

say, though, that I have taken part in a project named Enuite. As a part of this project, we discussed standards with the intention of sharing courses. We discussed standards for documents, data structures etc. [Aalborg]

5.4 *Limitation of size (number of students, courses, tutors.)* How satisfactory is the LMS for handling varying numbers of students, courses, and tutors? How does it cope with 100, 1000, or 10000 students and large course databases?

5.5 *Speed of system.* How is the speed of the system and student satisfaction? How does it cope with downloading courses and high bandwidth materials?

We experience a large variation in the students' bandwidth. It ranges from low speed modems (28,8 kbps) to broadband access above 1mbps. Hence, we don't use much compulsory multimedia course content. We do however provide some optional multimedia content, but most of the course content is based on text and graphics. [Aalborg]

6 Price

6.1 *Cost of the LMS (Learning Management System).* What is the cost of the LMS to the institution?

6.2 *Annual fee.* What fees have to be paid annually for the system by the institution?

FC licences last three years. We pay DKK 140.000 for three years usage by our 7-800 users. This is much money, but the price is not decisive for our choice of system. [Aalborg]

VU used to charge a yearly licence fee, but we don't pay anything at the moment. The company has changed their policy so that we only have to pay whenever we want to upgrade to newer versions. [Aalborg]

6.3 *Student Enrolment fee (100 students, 1000 students, 10000 students.)* How do fees to use the LMS vary when the student base is 100 students, 1000 students, and 10000 students? Is online invoicing available?

6.4 *Maintenance costs: staff involved in management, IT specialists, trainers, etc* What is the maintenance cost to the institution of the LMS and what staff resources are needed to maintain it and keep it functioning?

Each department pay our ICT centre a DKK 500 fee per student per semester for system operation and support. This includes student support during weekends and evenings. [Aalborg]

6.5 *Training of teachers and learners and system users.* What costs are involved in staff and student training to use the LMS system?

Conclusion: Overall evaluation:

The LMS systems are our primary tool for communication with our distance students. All courses except a very few completely rely on our

LMS systems. We are very dependant on the systems, so they must be simple and reliable in use. [Aalborg]

What features would you like to see included in this LMS in the future?

First, I would like to have better tools for synchronous communication, which includes video capabilities. Second I hope that we will have better integration with external tools and services such as for example multimedia tools. Third, I want a more open data structure in FC. [Aalborg]