

**COMPREHENSIVE ANALYSIS OF EXISTING LEARNING MANAGEMENT SYSTEMS
(LMSs)**

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LMS used:	<i>LearningSpace</i>
URL of LMS:	<i>domino.osu.cz</i>
Language of LMS:	<i>English</i>
Number of years in use:	<i>5</i>
Other LMSs used:	<i>Click2Learn</i>
Number of students in the system:	<i>100</i>
Number of courses available:	<i>30</i>
Typical duration:	<i>one term (14 weeks)</i>
Number of tutors in the system:	<i>20</i>

The Faculty of Science (FS) is one of four faculties within the University of Ostrava (the other three are the Pedagogical Faculty, the Philosophical Faculty, and the Medico-Social Faculty).

Five years ago the Faculty launched a study called "Applied Informatics" (duration of study 3 years, maximum 5 years) in a combined form of education with the possibility to obtain university first degree/bachelor after passing the State exam successfully. The Faculty uses Lotus LearningSpace for courses within the curricula of this study taught in a combined mode with the traditional, direct face-to-face form of education. There are none provided completely as online distance courses.

The Faculty is also included in a project of the "Virtual University" at the University of Ostrava, but there is not a direct link to the above mentioned study. The Virtual University uses different LMS. (*Virtual University: three Colleges: (1) Vysoká škola báňská-Technická univerzita Ostrava, Ekonomická fakulta / VSB - Technical University of Ostrava, the Faculty of Economics (2) Slezská univerzita v Opave, Obchodně podnikatelská fakulta v Karviné / Silesian University in Opava, the School of Business Administration in Karvina (3) Ostravská univerzita v Ostrave / University of Ostrava have started a co-operation in a project of building a virtual university at each of the colleges in order to provide distance education through online courses. Recently they have been introducing Tutor 2000 produced by a Czech firm Kontis as well as product ToolBook II Instructor by the firm Click2learn.*). The interviews with these colleges are also available).

Nowadays the Faculty is facing situation when, as already mentioned, the University is introducing a new system and on the other hand the existing LMS at the Faculty needs to be updated soon. That means either the Faculty will be implemented into the University system or maintain the current one. The disadvantage of the possible implementation is that the system is just starting and cannot fulfil the Faculty's needs neither at the moment nor in the near future. It is therefore more probable that the Faculty will decide for buying upgraded version of the current LMS.

The demand for the distance education within LMS is increasing day by day and the fact, that there are no courses completely provided as online distance courses at the Faculty, will have to be solved in the near future. One of the plans is to offer paid distance online courses by the means of LMS to the public as a kind of lifelong education.

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

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

The tools for structure creation are good. It is worse with the editing provisions of the LearningSpace system, that are even in comparison e.g. with text editors/word processors very weak (e.g. symbols, formulas, etc.) and multimedia is not even worth to mention. As well as the transfer of already written texts is not well solved. [FS]

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?

More or less. The division of the course into modules and the modules into single chapters enables to provide the student with the matter in logical, systematic and didactic way. The general course overview, its structure, course obligations/tasks, time figures, contact among the students and with the teachers, overview of reached results are satisfactory. [FS]

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

The operation of the system is not that easy. The teacher, who has no experience with IT, has problems. It is impossible without a teacher requalification. [FS]

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?

For the single creation there are just few provisions, but it is possible to implement features developed in other mediums into the course materials. In spite of this possibility a number of difficulties usually appear. [FS]

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

The testing within the system is sufficient. It is possible to create a database of questions, which can be chosen for various tests randomly (but always only within one particular course). The answers can be very variable, as well as the way of assessment. It is also possible to set time parameters. [FS]

2 Student support tools

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

So-called virtual classroom provide the possibility of creation of discussions on certain topics and all the student and teachers of the course can join them. [FS]

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?

Only asynchronous communication. [FS]

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?

The communication is asynchronous and is available 24 hours a day. It is available in two forms. In the virtual classroom there is the possibility for discussion on various topics and further the student places assignments into the system. The teacher gives comments to the assignments as well as a discussion can be launched about them. The assignments can be private (just the student with the teacher) or public. The assignments are assessed by the teacher. [FS]

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?

Through MediaCenter, which is an internal part of the system, it is possible to distribute all electronic resources. Of course links to other resources in Internet are used, especially on the websites of the University of Ostrava. [FS]

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

There is a very good feedback system in assignments. It is possible to adjust the solution status of the tasks/assignments for "in development", "sent for comments", "sent for assessment". Furthermore it is possible to vary the sent solutions to be private or public. [FS]

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?

All the student contributions including submitted assignments are easy accessible, they are sorted according to the topics, students, dates. [FS]

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

The group is always defined at the course beginning. The group creates a virtual classroom, where the students profiles and their portfolio are maintained. [FS]

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?

The tasks (distribution) are/is organised by special modules, where the tasks/questions are placed in. The students work out the given work (questions) and send for comments, or for assessment in the form of assignments, resp.. [FS]

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?

The student can display the course structure in the regime of schedule or calendar. In both of them the student duties, which the student must fulfil, are identified by a date. There are activities time-unlimited, activities time-limited or activities that must be fulfilled within a certain time interval. [FS]

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

In fact only in the way of discussion contributions addressed to the tutor. The system does not allow communication with the people outside of the course. [FS]

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 system is used as a support to the university studies and is linked to the IS of the University = the University Information System (IS Student), which ensures the student agenda (enrolments, study check, etc.). The payment system is not available/not being solved there. [FS]

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?

On the basis of the course enrolment the access to the course is created for the student. The system administrator always installs the student accounts in the LearningSpace system for those studying in this way. According to the IS Student the teacher directly place the students into the single courses. This activity is not automated. [FS]

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

For the number of our students and courses it has been satisfactory until now. [FS]

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

There is a result portfolio about each of the student. In fact it concerns the test results and assessments of the assignments. This creates the basis for an oral exam, which is always to be taken in a face-to-face form. [FS]

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

The LearningSpace does not solve this. The administration of courses, classes and teachers is covered by IS Student. (see above). [FS]

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?

It is currently already a lower/older version of the programme, which we have obtained within a support of new education form and in the meantime we do not possess financial recourses to buy an updated version. We would need more efficient/upgraded hardware as well as updated software. [FS]

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

No. [FS]

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?

Badly. It is one of the big weaknesses of the system. On the other hand I must confess, that I do not know the newest upgraded version of the LearningSpace system and therefore it is difficult to judge. [FS]

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

We do not have experience with a large number of students and courses, but I predict big problems by massive application. [FS]

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?

On the side of the LearningSpace is no problem. The students study by means of web browser. The problem is on the student side and it concerns mainly the speed of the Internet connection and the charges for Internet. In the Czech Republic the Internet charges are very high, the students must use discounts during the night and at the weekends. It is not always the best solution/ideal. [FS]

6 *Price*

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

I am not able to answer on this question properly. Fees for running the hardware and for administration of LearningSpace. [FS]

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

It is free of charge. It is a system, which has been obtained within education support and arrangement of new education forms. In the future we will have to solve this situation. [FS]

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, 10000 students? Is online invoicing available?

We receive state grant for each of the student, the student do not pay for the study. [FS]

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

One technician and one administrator take care of the single LearningSpace system. Further personnel is in charge of IS Student, with which the LearningSpace is linked. [FS]

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

Each of the teachers, who is starting the work with the LearningSpace, is trained in two types of training. The one is a training of the tutor of distance education (alternatively the author of the distance courses) and the second is a training how to operate the LearningSpace system. The first one runs as a distance course, the second one as a face-to-face course. [FS]

Conclusion: Overall evaluation:

For the current operation of the system in our education (approx. 100 students, 20 teachers) the system is usable. By higher numbers I do predict some problems. The system has quite satisfactory tools for the management of the education, it is worse with the tools for course creation. There is number of problems. The database administration would be very demanding and ineffective by higher number of students. The system does not solve the problem of relation/connection between a student and an education institution at all. The whole communication is just focused on the course. The communication e.g. with the study department and the whole study agenda is led/solved in the IS Student. The link between IS Student and LearningSpace is not automated. [FS]

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

- **Support for a creation of education multimedia materials**
- **Better import of already completed supports from other resources /environments**
- **synchronous communication**
- **Study agenda to be directly included as a internal part of LMS or automated link with IS Student**
- **More attentive environment as for the student, as well as for the teacher**
- **Czech localisation**
- **The possibility / provision of enrolment and fee payment to be within the system. We would like to use this form (by the means of LMS) to offer paid courses as a kind of lifelong education to the public.**