
EXPERIENCES WITH INTRODUCTION AND RUNNING OF AN E-LEARNING SYSTEM

S. Zárda; Dennis Gabor College, G. Bognár; Dennis Gabor College

Summary

The present paper is the closing chapter of a tripartite series of conference-lectures by the authors on the planning [1], testing [2] and final introducing of an e-learning system. In this paper the authors give an overview of their own experiences with introduction of a widely used e-learning system. Check points of this development are identified in this paper in aiming to guide followers to avoid time-consuming and expensive loops in this development process. Especially it is outlined, how the transfer was carried out from simple HTML publication to running of a complex learning content management system. Further development projects are detailed as well.

1 Introduction: state of art

Dennis Gabor College (GDF) founded in 1992 is the biggest higher education institution in Hungary in respect of number of enrolled students, dealing with distance learning. The number of students varies between 20 thousands and 30 thousands heads in a calendar year. For the present date the number of new students seems to be stabilized, approximately annual 2000-2500 heads. Organization of such mass of students, professors, hardware and software facilities requires a centrally managed content and administration system, a perfectly adapted structure and an almost military type discipline.

1.1 History of education technology development at GDF

During the past decade there was a tremendous upwind in the field of education technology. These changes are clearly reflected in the technology used by GDF. See the main stages of this development below:

- 1992: paper support and video cassette
- 1996: more and more documentation in electronic format distributed on diskette
- 1998: full range web support on Internet
- 2000: electronic documentation distributed on CD
- 2001: multimedia CDs
- 2002: early challenges in E-learning
- 2003: experimental E-learning (120 students), professional learning administration system
- 2004: full speed running of E-learning system (2400 students)

Today we consider that all of the above steps were necessary to arrive to our current level, but whoever wants to follow our example, he or she must carefully examine the only last two phases in our development history.

2 Focused on electronic learning technologies

When we say electronic learning technology, the basic and unavoidable technology is the publication on the web in HTML format. Today no higher education institution can roll without a correct homepage. This homepage, even in case when it is highly informative, can not be the source of contents to learn. However in the last decade of the 20th century, home pages of universities were filled with learning content, in aiming to distribute the content between the largest possible student populations. Today we know well that e-learning technologies give much more help to learner than the simple text documentation in passive form. The minimum service is the structured document with intelligent search engine. Universities must decide: whether continue publishing learning content with

minimum requirements or develop all-functional e-learning content and publish it for a reserved community. Those who want to take part in the distance learning business must choose the second option.

In electronic content development one can use much more sophisticated tools than in traditional paper-background document edition. Audio, video and animation files can be inserted also. In the last decade of the 20th century, when the internet penetration was less important than today, and the high speed file transfer was less available, the natural information support was the CD. On a CD, 650 MB directly accessible information can be stored. The content of the CD can be structured; consequently the intelligent research is available. The intellectual part of the development work is very similar to that of an e-learning content. The two important disadvantages are: easy copying, and the limited volume.

3 From the decision to the realization (2002-2003)

Once an institution is entered into content development and distribution on CD, only a very small step remains to enter into a real e-learning system. If a Learning Administration System is joined with a Content Management System, it can result in use of real e-learning system. As use of LAS is a basic requirement in case of running any higher education establishment in our country and we already have had some electronic content, the decision was evident: unify these two elements and introduce a real e-learning technology.

3.1 Development of methodology

First of all it is necessary to identify which topics are intended to be thought. The character of topics determines the technical tools to be used, which influences the applied methodology. As we are an IT school, we decided to use the full range of available technology components so our future LMS should deal with all possible elements such as audio and video files, animation and interactive components. We decided to create forums and chat-corners for our students. On the basis of these technical entities we developed a methodology guide in which we determined how to use these elements. This methodology guide was not only a methodology support but a technical support as well. Today, after a month test period and after four month of full speed running, we are convinced that this early methodology guide shall be subject of upgrading.

3.2 Selection of a Learning Content Management System

When selecting the LMS, our basic requirements which can be suggested to anyone who follows us were as below:

1. Capability to deal with all above detailed technical components.
2. Easy and efficient data exchange with our existing LAS.
3. Conformity with major international standards in field of e-learning (SCORM, LRN).
4. Easy content development tools.
5. High reliability low costs.

Analysing the market of LCMS systems it can be easily concluded that:

Ad 1: All available products can deal with the listed technology components.

Ad 2: No experience in field of data exchange with our existing LAS, consequently a development process is required in aiming to create this data exchange.

Ad 3: All available systems were in conformity with international standards.

Ad 4: How easy is using of a development tool, finally one can decide only by using of it. According to supplier promise all product are easy to use.

Ad 5: All supplier states that the reliability of their product is high, however measured reliability data were never published. The cost are subject of agreement, they may vary between wide ranges.

Consequently there were no significant differences between in respect of 1-4 points, point 5. shall be subject of detailed analysis. The total cost is the sum of investment costs and operation overheads. In respect of investment cost we may chose a free of charge option, which is the case of open source LCMS system such as ILIAS. In this case no technical support is available, excepted specialised forums on the internet, and the responsibility of technical development is the responsibility of the user.

When selecting the product of a well known supplier, one have to invest a considerable capital, but a permanent technical support is provided. In this case the reliability of the system will be certainly higher, than in case of open source software.

Finally we decided to invest in renting of the LCMS of a well known software supplier, which provided guarantees for the technical support, the data exchange between the LAS and the LCMS, and participation in development of a tool adapted to capacities of our staff. The rent agreement was concluded on annual basis.

3.3 *Experimental E-learning education*

We decided to develop four topics in aiming to test our methodology, the LCMS, and the topics themselves also. The content development needed about nine month, than in some three months we loaded our LCMS and we run a test period of about one month with 120 enrolled students. The test period was closed by an examination with the same condition as that of the students participating in normal courses. An overall success rate of 66% was obtained.

3.4 *Evaluation of results*

A detailed statistical analysis of result of this test period was published in our paper [2]. The main conclusion of this test in respect of methodology was that the chat-corner is unnecessary for the students and it is very difficult to realize for our teaching personnel. Instead of chat corner the use of forums shall be straightened.

The second important conclusion was that our personnel are capable to deal with technical problems of the selected LCMS and so probably they could provide a high reliability service with an open source LCMS also.

4 *Running in full regime (2004)*

See the results of the test period; we decided to run a full speed regime starting from October 2004, for all of our first-year students. In this respect about five new topics were necessary to elaborate.

4.1 *Replacement of the LCMS*

Based on financial and operating-security reasons we decided to use an open source LCMS, namely ILIAS 2.6. Now we benefited the fact that all of our previous topics were elaborated according to international standards, as the majority of our source documents were prepared in MS Word. We used a translation engine to load the same topics under the ILIAS system. In respect of introduction of the new ILIAS system we had to solve the problems as follows:

- Creation of an operating team with respect of high reliability.
- Install the new LCMS on our server.
- Solve the data exchange between our LAS and LCMS.
- Adapting the ILIAS system to Hungarian language.
- Load the topics under ILIAS.
- Run the system in 24/24 hours.

In fact we created two servers: one for the test and a second for the real running. Topics were tested first on the test server. If the met all quality requirements, they were uploaded under the real running system.

4.2 *Modifications on the methodology requirements*

Without changing the main goals of our methodology guide, further requirements were taken into consideration, namely how to transform existing paper-support contents to “semi” e-learning contents. It is based on the structuring of documents. A very strict structural transformation was defined for all of our authors with some obligatory components such as self-test, intelligent research in the document. Our concept was that the majority of authors are developing the content in MS Word, using the template which assures the conformity with international standards. Flash animations, video records in AVI format and audio records in WAVE format are welcome. Self-tests shall be elaborated in MS Excel, using XML format. Not all the components are necessary but there are some obligatory elements:

- Structured text in HTML format with internal and external linking.
- Self-test in XML format.

- Meta data characterising the topic (description of the topic, students guidelines)

4.3 *Running the system*

All topics of the first semester of 2004/2005 academic year were uploaded in September 2004. During the inscriptions the students were informed on the availability of our e-learning system. All of our 2400 first-year students were entitled to enter in the LCMS. In this moment this system is a parallel one, that is to say we provide traditional courses as well, the students may use the LCMS optionally. However a very decided part of students are actively participating in the electronic way of learning. About 10% of the unscripted students are regular user of the LCMS. There is a follow up system incorporated in the ILIAS, by means of which all enter in the system can be recorded and statistic can be made on the users' habitudes. So in this stage of the full speed run it can be concluded that:

- All enrolled students had visited the site at least once.
- 10% of the enrolled students are regular user of the site.

The percentage of regular users seems to be low. But one has to take into consideration, that in this stage of development we don't have the courage to use electronic learning technology exclusively. Even our case is not a typical "blended" learning, as students have the choice to decide if they want to follow their studies in a traditional way, in electronic way or in combining of the two methods. It is expected, that when the traditional way of courses will be withdrawn in certain local centres, the number of regular users will increase considerably.

5 Further development projects

We are decided to upload all of our topics (some 200) under the LCMS. The timing of upload process corresponds to timing of traditional courses, that is to say all topics of a semester shall be uploaded before starting the semester. We want to provide all topics for students who started their studies in 2004 October. That is to say, topics of the first semester of the second year will be uploaded before 2005 September and so on. In this phase we accept the simple adopting of paper-support content to e-learning content; however development of original e-learning content is welcomed. Due to the fact that in IT the deprecation time is very short it is expected that in case of half of the topics the content development will be recommenced at the end of the four years period.

We suggest that the content development will be carried out by our own personnel, by means of:

- MS Word template sheet (80% of cases).
- MS FrontPage (10% of cases).
- ILIAS incorporated development tool (10% of cases).

Even in case when MS Word is used as development tool, we prefer to create original e-learning content, in full conformity of methodology requirements, with full palette of available components. We hope that the shortly transformed paper-support contents will disappear more and more.

5.1 *Permanent quality control*

In respect of system operation important data can be drawn from the USER TRACKING facility of the system. By means of user tracking the operators may display all operations carried out in any segment of the system. From pedagogical point of view the number of users in time intervals can be very interesting.. The total number of entering was 4575 between the 26th of October and 10th of December. The table below gives distribution of entered users in one hour time segments. The maximum number of users was detected in the time segment 14-15h and 15-16h some 1500 heads. However it is interesting to state that there is a student activity between 0-1h AM.

It should be noted that during the 9 days of Xmas period, only 900 user entering was recorded. Unfortunately a breakdown of three days happened during the analysed period, due to a hardware failure.

Felhasználói nyomkövetés		
Idő	Számlálás	
0:00:00 ~ 1:00:00	100	■
1:00:00 ~ 2:00:00	43	
2:00:00 ~ 3:00:00	14	
3:00:00 ~ 4:00:00	35	
4:00:00 ~ 5:00:00	2	
5:00:00 ~ 6:00:00	9	
6:00:00 ~ 7:00:00	81	■
7:00:00 ~ 8:00:00	38	
8:00:00 ~ 9:00:00	690	■
9:00:00 ~ 10:00:00	867	■
10:00:00 ~ 11:00:00	738	■
11:00:00 ~ 12:00:00	798	■
12:00:00 ~ 13:00:00	509	■
13:00:00 ~ 14:00:00	562	■
14:00:00 ~ 15:00:00	1462	■
15:00:00 ~ 16:00:00	1471	■
16:00:00 ~ 17:00:00	1177	■
17:00:00 ~ 18:00:00	963	■
18:00:00 ~ 19:00:00	475	■
19:00:00 ~ 20:00:00	595	■
20:00:00 ~ 21:00:00	357	■
21:00:00 ~ 22:00:00	385	■
22:00:00 ~ 23:00:00	199	■
23:00:00 ~ 24:00:00	234	■
(Tétel 1 - 24 of 24)		

Table 1. User tracking: Distribution of user entering in one hour time segments

An online students-feedback sheet is annexed to each topic. The evaluation sheet is elaborated by an independent expert company having good experience in mathematical statistics. The evaluation of student's opinion is permanent. It is carried out when the current semester is closed. On the basis of students feedback conclusions are drawn in respect of quality of content and quality of tutoring to. The necessary modifications are done immediately.

References

1. S. ZÁRDA, G. BOGNÁR (2003) *Implementation Strategy of an E-learning System for a Population of 13000 students in Central Europe*, EDEN Annual Conference, Rhodes
2. S. ZÁRDA, G. BOGNÁR (2004) *Statistical Analysis of Students-satisfaction Inquiry related to E-learning Challenge at Dennis Gabor College*, EDEN annual conference, Budapest, pp 308-312
3. DENNIS GABOR COLLEGE, *LCMS site*, http://ilias3.gdf-ri.hu/login.php?client_id=Etor
4. DENNIS GABOR COLLEGE, *LAS site*, <https://etr.gdf.hu/etr/>

Authors

PhD, Sarolta, Zárda
Dennis Gabor College, vice director
H-1115 Budapest, Etele u. 68.
zarda@szamalk.hu

PhD, Géza, Bognár
Dennis Gabor College, head of faculty, System Organisation
H-1115 Budapest, Etele u. 68.
bognarg@szamalk.hu