ONLINE VERSUS OFFLINE EDUCATION USING E-LEARNING FACILITIES

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Development strategies

Dennis Gabor College is dealing with distance learning since its foundation in 1992. Since that time an enormous technical development has been take place in the field of information technology. Our college is concerned by this technology development in two aspects: once as it is the medium of information dissemination, second it is the subject of our education work. Hence E-learning technology, which is one of the latest achievements in this field, is an inevitable tool to develop our educational activity, which may have an outstanding effect on the exploitation of our structure. That's why we decided to introduce this system into our practice with extreme care. The first step of this introduction was the identification of our development strategy.

In general term there are two possible strategies of implementation of an E-learning system: first is characterised by intensive use of own resources, while second is based mainly on outsourcing. As we are specialised in education of information technology, our personnel is highly skilled in this field and we have almost all the necessary hardware facilities required for this implementation, it is evident to choose the first way. When this decision was taken we had to decide if we want use the new technology exclusively or mixed with traditional distance learning technology. Just for security reasons we decided this latter, that is to say maintain the traditional distance learning technology and use more and more the new E-learning facilities.

In the first phase of development we had to decide which type of frame system we want to use. It seems to be a pure technical question, however it is a strategic one, as using free download frame system requires more own resources than use of any highly specialised software, available on the market. In this first step we decided to rent a ready frame system supplied by IBCNET. However in aiming to maintain the liberty to ulterior change of this decision, we decided the strict respect of related international standards such as SCORM and LRN. This way we assured the relatively easy change from one to another frame system, as it was our case.

Today we are convinced that it is necessary to determine in the early stage of development the ratio between online and offline components, as it influences considerably the exploitation costs. In aiming to determine this ratio it is recommended to use a methodology guideline.

Online and offline components of an E-learning frame system

When evaluating the quality of an E-learning system, the real-time operation has an outstanding importance [1] [2]. It is often said about E-learning technology, that it is an online one. However the word "online" shall be subject of precision when planning the exploitation of an E-learning system, as to assure real on-line operation needs more human or technical capacities. We suggest using the expression "online" only for those components of E-learning technology, which assure a real-time answering to the student's questions. Applying this limitation the online and offline components are as follows:

Online components

Chat corner

Each known frame system contains a chat corner. In the chat corner an online chatting takes place in a formerly fixed time, published in the agenda. In general case the chat corner is moderated by the tutor. It should be noted that the online chat means a considerable charge for the tutor if only text typing is applied, and if really all questions should be answered online.

Self test

The general idea of self test, which is often called online examination, is to choose the correct answer from a retain number of possible answers, or eliminate the false one. These self tests can be easily entered in XML format into any type of frame systems. However we can not consider the self test as the right way of examination as it requires dedicated classroom with accredited supervision personnel. In this moment we consider that the only way of examination is the personal contact between examining teacher and the candidate, both in case of oral or written exams. Due to the required personal contact, the overheads of the human resources can not be reduced below a certain level.

Face to face training

Even with E-learning technologies face to face training is required in some cases. Mainly with first generation, not too much user friend frame systems there was a need from student's part to assure initiation training in use of the frame system. However with technical development the user interface and the operation with the frame system become more and more easy, accordingly this requirement disappears more and more. However we always considered that the purpose is to learn the selected topic, not the use of the frame system, that's why the frame system should be the easiest possible.

Offline components

We consider as off line components those, which do not provide a real-time answer to student's questions, however all the communication between the student and tutor takes place via network facilities.

HTML documents

It is the most usual component of documents. It shall be well distinguished from a paper-support book, as the hierarchic structure of the document is much more important in this case, as it is required by the SCORM normalization. Internal and external links are organic parts of this type of documents. It is suggested to link, and not to incorporate, any other files (image, video, sound, animation) to the original document.

Video records and computer animation

Usually video records are saved in AVI format, and they are compressed according to various standards. Due to the relatively big file size, this type of documents shall be distributed on CD, and linked to the hot points of the HTML document. This way the video file does not run as a single entity, but requires the HTML document to which it is linked, and so the HTML document organises the use of video files. Flash generated computer animations are widely used also. These animations are linked to the original HTML document too.

Forums

Each frame system might contain various forums adapted to the hierarchy system. The most common use one is the forum of students. Perhaps it is the most efficient element of the self-learning procedure. A well moderated forum can reduce considerably the charge of the teaching personnel. Specialized forums can be opened for the tutors and for the administrators as well. The structure of the forum, shall be very clear and an easy to overview one.

Emailing

All frame systems allow an internal communication via Email facility. The tutor and the manager shall be very careful not to confuse E-learning related and other mailing. All E-learning related mail communication shall be carried out within the frame system, as these mails are registered, while external mails aren't. The registration is very important, as due to the contractual relation between the students and the school, the mail communication may have legal consequences.

Agenda

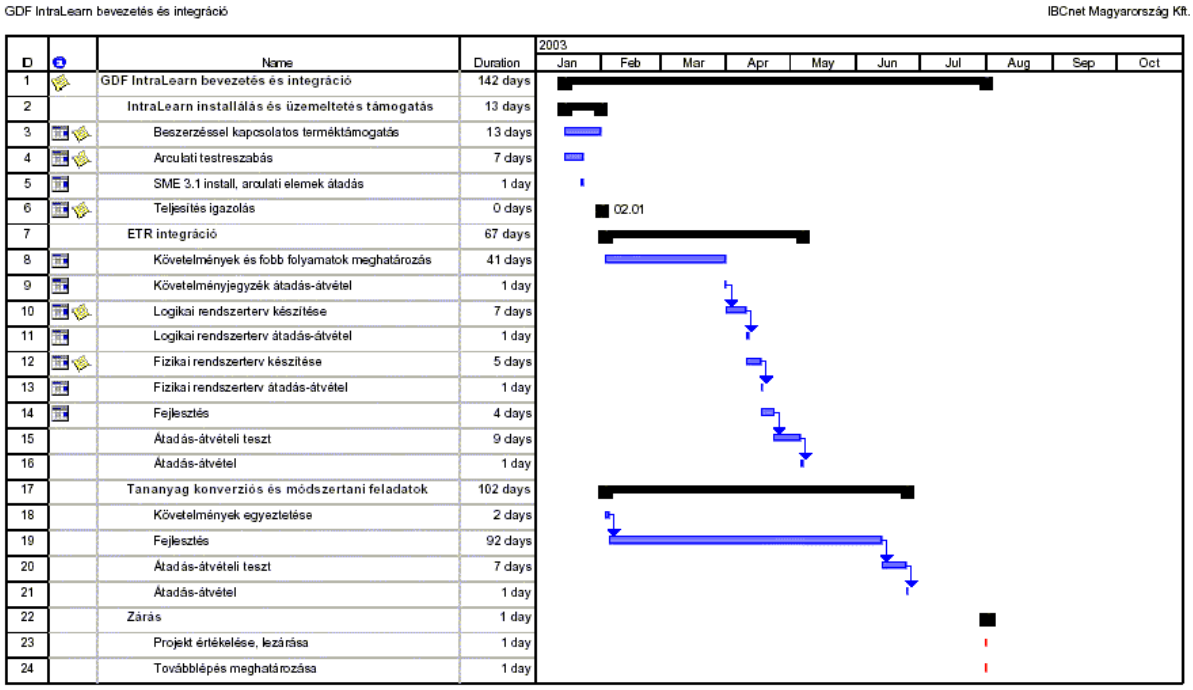
The tutor communicates the date and hour of important events via the agenda. It is a sort of bulletin which can be personalized by the students also.

Implementation of the IBCNET IntraLearn system

After evaluating the technical and pedagogical parameters of various frame systems, we decided to rent the IntraLearn system supplied by IBCNET. In respect of technical parameters it can be concluded, that all the evaluated frame systems are characterised by the same technical features, however there is a difference between the levels of realization of them. The basis of the decision was the proposed services and the price of the system. As we didn't want to make a definitive selection in this early stage of development, we strongly decided to respect fully the SCORM normalization, in aiming to maintain the possibility of an eventual change in the frame system, which was the case finally.

Creation of the implementation project

To implement such a software system is a very heavy responsibility and it can not be compared with buying any other high value material, as the safe operation of the system regards several ten-thousand students. En eventual administration error might cause financial and legal bankruptcy of the school. As there are several participants from the supplier's part and from the school's part also, it was necessary to create a project for the implementation procedure. The overview of the project is given on figure 1.



ID	Name	Duration
1	GDF IntraLearn bevezetés és integráció	142 days
2	IntraLearn installálás és üzemeltetés támogatás	13 days
3	Beszerzéssel kapcsolatos terméktámogatás	13 days
4	Arculati testreszabás	7 days
5	SME 3.1 install, arculati elemek átadás	1 day
6	Teljesítés igazolás	0 days
7	ETR integráció	67 days
8	Követelmények és fobb folyamatok meghatározás	41 days
9	Követelményjegyzék átadás-átvétel	1 day
10	Logikai rendszerterv készítése	7 days
11	Logikai rendszerterv átadás-átvétel	1 day
12	Fizikai rendszerterv készítése	5 days
13	Fizikai rendszerterv átadás-átvétel	1 day
14	Fejlesztés	4 days
15	Átadás-átvételi teszt	9 days
16	Átadás-átvétel	1 day
17	Tananyag konverziós és módszertani feladatok	102 days
18	Követelmények egyeztetése	2 days
19	Fejlesztés	92 days
20	Átadás-átvételi teszt	7 days
21	Átadás-átvétel	1 day
22	Zárás	1 day
23	Projekt értékelése, lezárása	1 day
24	Továbblépés meghatározása	1 day

Figure 1. The timing chart of the implementation

Methodology and technical support

In aiming to assure a standardized electronic education a unified methodology guide was developed to help the personnel in the development. In this guide the ratio of major learning object components was established. In aiming to help the technical realization of the learning objects, a technical support guide was edited also. In this latter we suggest some methodology aspects also.

Hosting the frame system

According to the agreement with the supplier, the frame system can be hosted on the server of the supplier or on the server of the school also. To decide where to host the frame system, needs a very careful analysis of the SW and HW environment. Do not forget, that hosting the frame system on your own server needs operating personnel as well. Perhaps to host the system on the supplier's server is somewhat more expensive, but the operation is safer.

Training of the personnel

The successful fulfilment of the project needs competent operation and development personnel. As our school is specialized in IT, our personnel already has the basic skills to success in this project, however in some very deeply specialized matters further trainings were required. The operation personnel were fully trained by the supplier, why the development personnel were trained jointly by the supplier and by our chief managers.

Learning object development

When we decided to develop learning objects by our personnel, it was suggested, that the personnel is skilled enough to create a well structured document by means of MS Word or MS FrontPage. In cooperation with IBCNET development staff, we created two style sheets according to the above two softwares, in which the styles of blocks, chapters, subchapters, sub-subchapters and that of the normal text was identified. In these style sheets it was clarified how to link other objects, such as video and audio records, pictures, internal and external links. These style sheets were in absolute conformity with LRN and SCORM standards. We obliged our development personnel to use exclusively these style sheets during the development. Once the content development was ready, it was entered into the frame system by means of a translation engine.

Cold test

When the first course was ready, we carried out a cold test without participation of students. Some 30 staff members were testing simultaneously the use of learning objects and the online components of the system. Some important errors were detected during this test. The errors were reported to the supplier, and the major part of them was cured before the hot test.

Hot test with four pilot courses

We carried out a hot test using four pilot courses as follows: 3D modelling with CADKEY, Spreadsheet methods wit MS EXCEL, Project management with MS Project, Microcomputers. Some 120 volunteer students were enrolled in the test. 33 of them took part in the examination at the end of the lectures. 67% of the participant passed the exam. The 33% of failed is not too much, however as all of the failed cases were detected in the same module, certainly this module has contextual problems.

During the hot test we assured a weekly 2x2 hours online chatting to our students over four weeks. The topics of the chatting were always published previously in the agenda. The average participation was 30% of the enrolled students. At the end of the hot test we organised an examination for the volunteers, with the same conditions as we usually use.

Analysing online and offline experiments

During the weekly 2x2 hours online chatting we found that the participation of the students was very intensive even abusive. That is to say the participating students ignored the other components of the system and they wanted to solve the current problem exclusively with tutor's online assistance. It is a typical case in normal face to face education also, that students want to take part in the seminar without consulting the theoretical course. It is very bad practice to be avoided in case of face to face education and even it is worse and unacceptable with distance learning, especially with E-learning. The tutor is unable to chat with more than ten students simultaneously!

In comparison with chatting, the forums pages were almost empty. The tutor initialised time to time new topics, but there was no interest from the student's part. They always preferred the online solution. Perhaps the hierarchical embedded structure of the forum was too difficult to overview. An ordinary sequential forum might face better the requirements.

Unfortunately the internal E-mailing system was not operating during the hot test, so we can not evaluate this feature. However some mails were exchanged via the external E-mailing system. But it can be concluded that no important need for E-mail communication was manifested.

When the exam was ready, we invited the students to fill up a satisfaction enquiry sheet with 17 various questions, the result of which is analysed in our other paper [3]. However the result of the question dealing with student's preferences of various types of E-learning components is given on figure 2.

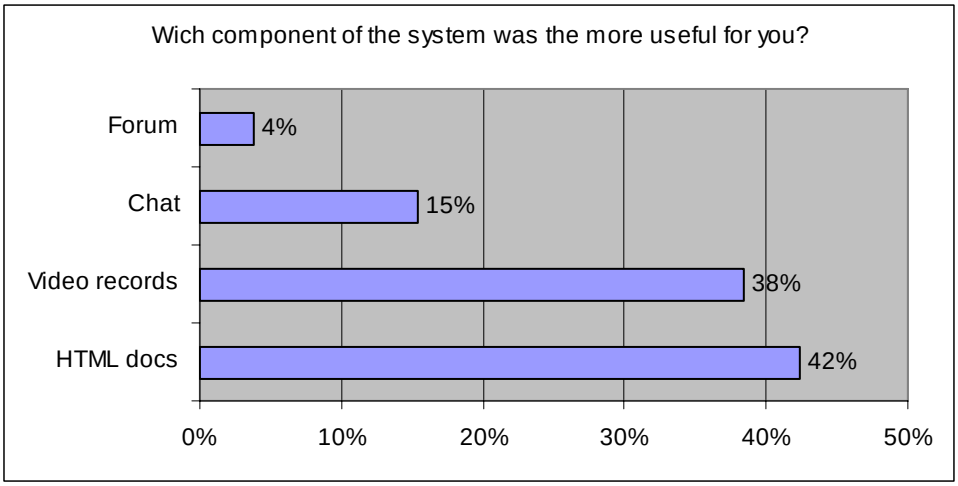


Figure 2. Student's preferences of using E-learning components

It is clearly seen from the diagram, that the overwhelming majority of students, say 80% used the HTML documents and video records. The 15% of those, who utilized the chat, is confirmed by our statistics also. The only problem with this 15% of students is that they wanted to use exclusively chat without using other less expensive components. The very low, say 4% of forum-users may be explained by the bad structure of the used forum.

Any way we have to obtain that all the components would be used by our students. The utilization of online components requiring human resources shall be minimized, and the ratio of forum users shall be increased, if we want to ameliorate the income/expenses ratio of the education.

Conclusions

The twelve month of operation of our E-learning system has yield to important conclusions related to further development and operation as follows:

- Content developers shall be supported with the easiest and cheapest development tools in aiming to concentrate their forces on the topic to be developed. The result of content development shall be displayed according to SCORM and LRN norms. Self tests, similar to the examination problems shall be developed in XML format.
- Online components requiring permanent human resources may increase considerably the educations overheads. That's why it is suggested to reduce the volume of online chatting and increase the volume of forums.
- In aiming to maintain the online character of the education automatic online components, such as self-test shall be applied widely.

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