

Implementing Advanced E-learning Facilities. Case Study for Babes-Bolyai University, Cluj-Napoca, Romania

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Abstract - The paper focuses on efficient strategies and mechanisms for implementing advanced e-learning facilities at a large scale. We systematically address IT implementation principles of the system: aims and requirements, solution assessment, implementation stages, impact. We present the case study of Babes-Bolyai University upgrading its e-learning systems with the view to offer the benefits of combined e-learning mechanisms for a considerable number of students, in a large geographical area, at a high quality. We study the impact of the implemented facilities on the students' learning path

Index Terms - e-learning, project implementation, IT strategy, solution assessment, learning impact

1. E-LEARNING FACILITIES AND SYSTEMS

The Internet and its advanced information & communication facilities became a genuine tool for developing e-learning facilities since early '90. While first implementations consisted in creating efficient web pages, designed on goal oriented approaches and student centered principles [9], more complex facilities were soon added:

- electronic communication tools – discussion lists, forums etc. on specific learning topics;
- remote evaluation applications – automating quiz and fill-in tests;
- adaptation facilities in order to adjust the educational content and path for each student in respect with his / her learning aims, preferences and characteristics. More precise, adaptation facilities [7] may focus on: adapting the educational content to the students' knowledge level based on preliminary evaluations, choosing the most efficient presentation form for each student (graphical, written, multimedia) based on psycho-pedagogical student profiles, adapting presentation forms to disability cases, adaptation to technical resources – connection speed, language adaptation.

The integration of such facilities leads to creating distributed intelligent educational systems [10] – genuine expert systems – distributely accessible and offering a large variety of adaptive & interactive facilities, regarding both knowledge assimilation and evaluation. The implementation of the above described adaptive facilities, including refined

integration of multimedia content, highly contributes to an efficient learning.

E-learning systems offer teachers advanced tools for organizing the educational content in a form that is appropriate for distance learning and various facilities that aim at obtaining efficient learning feed-back – like statistics regarding accessed courses, student tasks and results in their educational path.

Pedagogical researches have proved that e-learning technologies not only influenced student learning capabilities and teaching methods, but globally supported the development of the student centered learning model, by having a strong impact on both teaching and learning [1]. The “new” educational model encourages students to become more responsible of their educational path, by pursuing it according to their preferences and goals. This paradigm modifies the teachers' role: they become tutors who guide the students in the educational universe created by the e-learning system and emphasize cooperative and project learning.

Therefore, e-learning systems may be viewed as advanced tools which assist teachers in creating a cooperative, multidisciplinary and explorative learning environment and students in accessing these learning facilities and developing learning interactions within this environment.

All the above described learning facilities are to be integrated into expert e-learning systems, with distributed characteristics and accessible via Internet, created in order to support advanced student training by overcoming classical geographical and time constraints.

2. E-LEARNING REQUIREMENTS AND STRATEGIES

Efficient implementation of information systems should be strongly based on systematic system requirements [5]

The implementation of e-learning systems should pursue similar rules and stages to the implementation of other information systems, user role being crucial in the specification, verification, system installation and exploiting phases. In this respect, specific requirements should be taken into account for each user category: students, teachers, administrators, secretaries. It should be verified that these roles and their corresponding permissions are appropriately implemented and that specific facilities are available to each of these user categories.

Though e-learning capabilities are quite well defined, it is often useful that adaptive characteristics are also possible to be implemented and stage development is ensured in respect with user needs (see 4). In this respect, system maintenance has to be taken into account both by the user side and by the system provider in order to ensure that adequate system use and current exploiting issues are appropriately managed.

While e-learning systems have significant advantages in eluding time and space boundaries, it is also very important that technical aspects are also taken into account in order to ensure adequate system use. Internet connection speed and band width are crucial for videoconference integration, facility that has to ensure mainly course broadcasting within e-learning systems. We note that adequate software has also to be available in order to support videoconference communication facilities.

3. E-LEARNING IMPACT ON STUDENTS

Internet information & communication services have an increased impact in the whole society, and even a stronger one among youth and students [3], fact that creates good premises for a wide use of electronic facilities and e-learning systems in education.

The implementation of IT mechanisms in teaching, and making electronic courses available, induces an increased student responsibility regarding the educational process and a more active student implication in training. The overall shift towards a more student and goal oriented teaching model is also a very important effect of implementing IT and e-learning facilities in the educational process.

In order to evaluate the effect of implementing IT mechanisms in teaching, we performed a study during 2002-2003 by means of a web questionnaire [4], which was on-line filled in by around 100 students in our faculty. The questionnaire was implemented in php, the results were collected in a mysql database and consequently processed in a dedicated spreadsheet. The results showed an increased interest of students of IT tools as a learning support and a very good perception on integrating such tools in the learning process.

Taking into account the conclusions of this study [4] on IT mechanisms in teaching, including the implementation of a guided path with feed-back mechanisms in studying an IT course (see figure 1) we can state that most students:

- have a good perception about on-line feed-back and evaluation mechanisms (around 80% in our study);
- have a good opinion on the efficiency of e-guidance mechanisms (75% in our study);
- are eager to use web courses and electronic facilities in learning

Regarding gender distribution, we found similar perception regarding the use of electronic facilities in learning. Still, an interesting result regards the stronger orientation of male subjects towards information facilities and of female subjects – towards communication ones [3]

The implementation of guided paths in learning by means of cgi mechanisms and feed-back questionnaires for each topic (figure 1) was strongly appreciated by the students

enrolled in our distance learning programs (to whom it was particularly dedicated): students sustained that such mechanisms are much more efficient in learning than plain course web sites

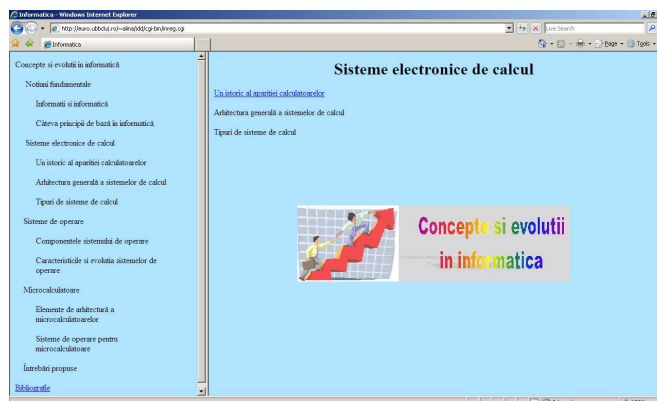


FIGURE 1
CGI IMPLEMENTATION FOR GUIDANCE IN STUDYING A WEB COURSE

In this context, we consider that the power of e-learning systems, which integrate various electronic facilities in learning, has an utmost importance for students and strongly impacts on the learning process, statement that is valid for all the “actors” involved: students, teachers, administrators / managers

4. CASE STUDY ON BABES-BOLYAI UNIVERSITY. SYSTEM REQUIREMENTS AND ASSESSMENT

Though not at its first e-learning implementation, “Babes-Bolyai” University recently decided to upgrade its e-learning system since the existing one did not meet all necessary requirements, mostly regarding de-centralized administration and complete integration of different e-learning facilities. The upgrading necessity became clear as the number of students enrolled in distance learning programs significantly increased in the last years and the university expanded in the region.

In this framework, the goal was to implement a more complex e-learning system, aiming at sustaining the more ambitious distance learning programs launched by the university. The system should be efficiently accessible from a wide geographical area, by around 5000 students, who should have available advanced e-learning facilities, integrated into a user-friendly e-learning system, in order to sustain their educational path in an efficient manner.

Supplemental to usual e-learning requirements, the following specifications were considered very important:

- increased flexibility; adaptability to future requirements;
- adaptive stage development, flexibility in upgrades;
- adaptability in curricula organization based on studied courses;
- increased user accessibility;
- administrator accessibility, development potential;
- de-centralized system administration facilities;
- multi-language support, capable of sustaining the strong multicultural profile of the university;
- natural customization in respect with our university’s organization culture.

Taking into account these requirements, mainly oriented on flexibility specifications, we decided to implement Microsoft Learning Gateway [11], based on dedicated Microsoft Internet servers, which ensure not only the integration of various e-learning facilities in a very user-friendly manner (see figures 2, 3), but also system development in respect with different specifications and adaptability in stage development according to the university's needs. (Examples of such facilities that were already added into the system regard schedules and fees – customized in respect with the user category.)

We note that the public-private aspects of published information are also very well managed by the permission system, customized for different users and user categories.

MS Learning Gateway is to be complemented by dedicated videoconferencing facilities which are still under implementation and aim at upgrading the existing dedicated videoconferencing system, mostly used in order to broadcast lectures in the university's regional branches, at a high technical quality.

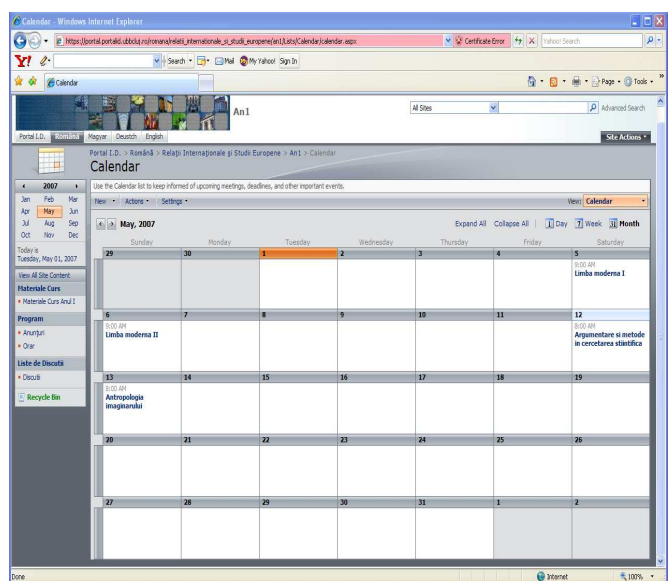
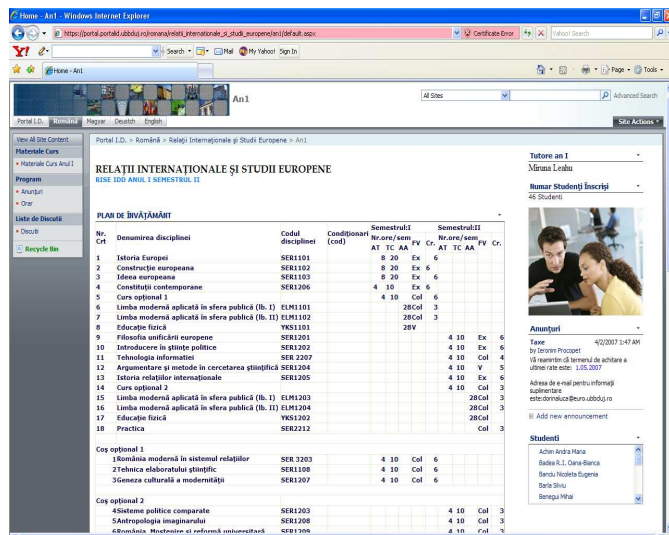


FIGURE 2
SYSTEM INTERFACE : CURRICULA, SCHEDULE

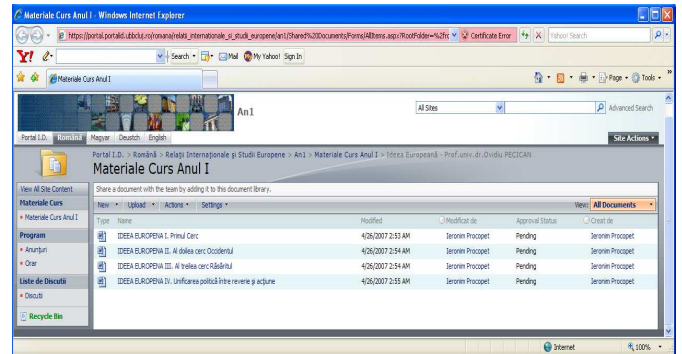


FIGURE 3
SYSTEM INTERFACE : EDUCATIONAL CONTENT

Regarding the *system assessment*, we should state that it is still undergoing, since the system implementation is quite recent (early 2007). In this respect, we also note that guided e-learning facilities are still being developed

The first implementation stages relied on de-centralized system administration by faculties' administrators and continued with 'filling-in' the system with the necessary learning information: curricula, courses and feed-back material, schedules, contact information, additional shared information. Student and teacher categories are in the first stages of using the new e-learning system.

Until now, feed-backs are positive and the flexibility specifications that were pursued in choosing the system have proved their accuracy both for user categories, and administrators, while system adaptability supported the desired "add-ons". Nevertheless, we shall continue in monitoring the system in order to ensure its most appropriate use and development; in this respect, we are confident that our prerequisites regarding adaptability specifications in system upgrades will also prove to be very useful in the future

5. CONCLUSION

E-learning systems may be viewed as advanced tools which assist teachers in creating a cooperative, multidisciplinary and explorative learning environment and students in accessing these learning facilities and developing learning interactions within this environment. The implementation of e-learning facilities strongly contributed to the development of the student and goal centered learning model.

System implementation should pursue the same principles and stages as for other dedicated software systems [5]

The user involvement within the stages of system requirements, verification and implementation are of utmost importance for a successful implementation. Though e-learning facilities are fairly standardized, it is important to take into account future upgrades of the implemented system

We present the IT strategy principles that guided the recent upgrade of the e-learning system within "Babes-Bolyai" University of Cluj-Napoca, Romania. The flexibility system requirements that were pursued are expected to prove their efficiency in the future developments of the system

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