

**User Group: Kaleidoscope**  
**Case Study: Introduction of E-learning at the University of Sofia, users as validators**

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# **1. Introduction and relevance of the case study: user as validators**

According to the Users' group work plan, several case studies have to be described, each one dedicated to different sectors (non-TEL researchers, Higher education, Initial school education, Home education market, etc.), as well as analyzing different roles the users play (user as validator, user as participant in the research, user as stakeholder). The goal of these case studies is to highlight different dimensions of users' needs linked to different typologies of users in the form of short descriptions and examples of real experiences on what learning in a specific learning context is, and related concerns about the use of ICT in order to exemplify how input for research agenda can be collected from different learning contexts.

This report aims to present a case study linked with the Higher education sector, which reflects the point of view of users as validators. The users in this case are University professors, which are trained on how to apply e-Learning in their regular teaching activities. During each phase of their training they have to fill a questionnaire, in order to give their opinion about the appropriateness, quality and effectiveness of the training. After the training each professor is asked to develop an e-learning solution for the subject that this professor is teaching in the University. At the end all professors demonstrate their solution, and participate in the final discussion. After this discussion each professor prepares a critical overview about the usefulness of the e-learning in the normal teaching process at the University. These critical overviews provide the analytical basis for the elaboration of recommendations useful for the implementation of e-learning in the normal teaching at the University of Sofia.

The outcomes of this case study will contribute to the elaboration of a set of tools, which will be made available to KALEIDOSCOPE researchers (experts in Technology Enhanced Learning, TEL), in order to help them to structure their dialogue and negotiation with Users.

This particular case study represents the experience gained during the World Bank funded project "Introduction of e-learning for the students in natural sciences at the Sofia University "St. Kliment Ohridski", Bulgaria (2002-2004).

## **2. Description of the case study**

Developments in the sphere of information technologies (IT) marked a spectacular progress over the last decade. A major portion of the information is being circulated by using modern information technologies (radio, TV, video, various types of telephones, INTERNET, CD and others). The revolution in data transfer is based mainly on the fact that modern technologies allow storing a huge volume of information on a small surface whereas the information may be transmitted at high speeds to any point on the Earth. These developments are influencing also the methods of tuition.

Electronic learning (E-learning) has been developing independently and in parallel with traditional methods of learning, thus introducing a number of attractive features.

As a result, E-learning is capable of meeting the requirements of a large group of students who prefer more individual and flexible way of learning. Recognizing these circumstances, the World Bank has allocated funds for a project on the introduction of E-learning for students in natural sciences at the leading high school in Bulgaria - Sofia University "St. Kliment Ohridski".

There were various developments so far being implemented and financed within the framework of the PHARE Multi-country Program for Distance Education, or within other projects financed by various EU programs. As a whole, however, there were very few successful implementations, and they did not cover the curricula of complete university programmes. There were no curricula or teaching programs for the existing specialties in natural sciences and mathematics courses in Bulgaria that cover all levels of higher education and that match the needs of E-learning.

The project was implemented at five of the departments of the Sofia University "St. Kliment Ohridski": Geology and Geography, Chemistry, Mathematics and Informatics, Physics, Biology. The natural sciences and mathematics courses provide numerous options for the application of E-learning as these courses employ a different illustrative material that is comprehensively accessible exclusively through IT methods and assets. These are charts and drawings, information arrays obtained from the global network, solutions to tasks and tests, self-test options, the development of various real-time models and solution scenarios, etc. A task of such a complexity could be successfully resolved by means of complex electronics-based regular and remote learning that includes:

- Distance (remote) E-learning;
- Discussions with tutors in face-to-face mode;
- On-site or laboratory studies of natural objects;
- Appraisal of the accrued knowledge by direct or indirect methods.

The major objective of the project was to develop the conditions necessary for the introduction of E-learning at the Bachelor of Sciences and Master of Sciences levels at the natural sciences and mathematics departments at the Sofia University "St. Kliment Ohridski".

To reach this objective, the project aimed to solve two general problems:

- Adjustment of the existing curricula and teaching programs to the E-learning requirements and technology and establishing the necessary equipment and rules for the E-learning implementation;
- Training of professors in the methods and the technologies used to create tuition tools and to conduct E-learning courses.

We will concentrate on the activities linked with the training of the University professors, which were the main users of the project results, and acted as the project validators, in order to improve the effectiveness of the project outcomes.

### **3. Objects of validation and involvement of users**

In the evaluation process we can distinguish the following main stages:

- stating the properties to be measured, or basic requirements to be met;

- designing the evaluation activities (what to measure, who is involved, how it is performed);
- performing the planned evaluation activities and collecting the data;
- analysis of the data: how they support/answer to the basic requirements;
- conclusions, what revisions and improvements are necessary.

The main requirements for the project validation were first formulated:

- All trained professors, at the end of their training, have the needed knowledge and capabilities to apply E-learning in their teaching.
- Sufficient infrastructure for the implementation of planned E-learning activities is in place (new multimedia centres for E-learning established and active).
- All professors and other relevant academic personnel engaged in the E-learning delivery are highly motivated and enthusiastic.
- All the planned curricula changes are implemented and adopted.
- New rules for the E-learning implementation and delivery developed and adopted.

On the base of these requirements a set of checklists was prepared as a main measuring instrument. These checklists were used to measure how the project implementation contribute to the satisfaction of the stated requirements.

The following main evaluation activities were planned:

- structured expert reviewing (heuristic evaluation) - five independent experts (E-learning experts from other Bulgarian Universities, not participating in this project) were involved in structured interviews in order to evaluate the impact of the project results (analysis of curricula developed, E-learning rules implemented, and E-learning courses developed by trained professors);
- regular questionnaires with users (professors being trained) – to determine the levels of satisfaction and motivation, as well as their judgement about the appropriateness and effectiveness of training.

We plan our evaluation as a continuous process, involving different but regular and complementing each other validation and evaluation activities. Our project was divided in several stages, each one ending with specific milestone to be achieved. During each stage we involve our users to evaluate the activities performed using regular questionnaires connected with the processes performed. At the end of each stage we performed expert reviewing in order to measure how well the activities planned were actually implemented and were the milestones achieved.

For the evaluation and validation by users (trained professors) a special Web forms were used with two types of questionnaires in order to collect their opinion for wide group of questions related to the fulfilment of the project outcomes.

The evaluation focuses on predicting:

- conformance of the training to the users' needs;
- usability of the training (acceptability and applicability);
- efficiency (cost-effectiveness);
- effectiveness (users' satisfaction)

The rationale for choosing the questions in the questionnaires developed was based on the measuring of achievement of each one of the stated requirements.

At the end, using different statistical methods, we received a score for each of the stated requirements, which helped us to measure the success of each one of the planned project activities. In such a way we used the users' validation of the project implementation for the further improvement of the all project activities, which resulted in successful implementation of E-learning at the University of Sofia.

## **4. Main facts and figures**

The working team includes two groups of professors. The first group incorporates the persons in charge of the project who have all attained an academic rank and who have demonstrated their abilities in the sphere of E-learning and their experience in administration and governance and who shall be active participants throughout the project implementation. The second group incorporates professors at partner departments whose task is to adapt the specific curricula after they have participated in a seminar dedicated to E-learning technologies. The duration of the project was 18 months.

The successful implementation of the project brings the following results:

- Adjustment of the curricula and teaching programs to the methods and the options of E-learning in all participating departments
- Improving the quality of education
- Involving substantial target group of students who for various reasons are not able to attend regular university courses.
- Raising the level of expertise of the academic personnel.
- Establishment of rules for E-learning at the Sofia University "St. Kliment Ohridski".

As a result of the project, thirty five professors were trained, eight curricula programmes were adapted for use in E-learning, twenty three new E-learning courses were created, rules for E-learning development and implementation at the University were adopted.

One big consequence of the project was demonstrated in 2005, during the first national competition between Bulgarian Universities for development of E-learning courses. The University of Sofia was the most widely represented in this competition, and was awarded with prizes in 70% of all competition categories.

One of the main reasons for the big success of this project is the fact, that users were involved in the project evaluation and validation since the very beginning of the project. The proper interpretation and implementation of the users' recommendations is the main factor for the success.

## 5. Conclusion

The successful completion of the project resulted in the creation of the first comprehensive natural sciences and mathematics E-learning system in Bulgaria. The effects were further multiplied by applying the acquired experience at other departments of the institution called the Sofia University as well as at a regional and at national level at all higher schools in Bulgaria. This process will create the conditions necessary to raise the level of education in Bulgaria to the levels traditional within the European Union.

**The key lessons of the project experience in dealing with users are presented below:**

- Plan the evaluation and validation activities with the users as soon as possible.
- Design your training as flexible as possible, in order to adapt to the users' needs and expectations, as well as to provide individual support and tailor-made training
- Involve recognised experts from other educational and training institutions as external validators
- Involve important decision makers from the University in your project in order to have full institutional support for all of your activities
- Plan well the technology support your project will need (hardware, software, communications, infrastructure, etc.)
- Try to involve users with different roles in your institution (students, professors, technicians, managers, etc.)
- Plan well your marketing activities, and try to keep users motivated and positive to your project
- Involve your users to planning and evaluation of the learning and training