

Good practices for sustainable implementation of e-learning

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Abstract

Nowadays universities have to prepare their graduates for the technology-driven digital information era. A transition toward e-learning, ranging from a technologically oriented face-to-face classroom to fully online setting and blended courses becomes necessary.

In this paper, we share our experience in introducing e-learning at New Bulgarian University. Good practices in conducting regular and distance training are presented.

Key words: e-learning, Moodle, practices

INTRODUCTION

The development of ICT makes possible significant modifications in the overall educational process and permits to deliver traditional learning tasks online. The advent of e-learning has bridged the gap between distance and education. Learning management systems (LMS) represent an infrastructure platform intended to facilitate the delivery and management of learning content for both distance and regular education. These systems offer various software tools to perform functions concerning training, administration and performance management. Present-day LMS are web-based to facilitate "anytime, anywhere" access to learning content and administration. By personalizing education content to suit every trainee, educators can fulfill their aim of enhancing student performance. In addition, digital natives enjoy new educational approaches dealing with technological innovations.

The e-learning platform has to offer a variety of functions to meet the requirements of the technology enhanced learning. Today the development of custom-made LMS is not worth as the market provides various solutions. There is a lot of available commercial or open source software. Finally, courses are implemented via the e-learning environments that universities have decided to adopt.

Investigations carried out from LISTedTECH [1] show that Moodle [2], Canvas [3], Google Classroom [4] and Blackboard [5] are the preferred LMS for many universities. At New Bulgarian University both the full-time and distance education are enhanced by the Moodle NBU platform. This infrastructure provides access to e-learning content for each course and supports active communications between instructors and students.

In this paper, the experience gained by the authors concerning administration tasks and delivering courses via Moodle is discussed. Good practices in conducting regular and distance training are presented. These practices conform to the announced educational policy of the university [6] in the context of the implemented e-learning platform. At the same time, they are the result of the specifics of the subject areas and the learning process. The optional presence of students during the regular classes and the fact that most of the courses are elective also influence curricula and the structure of learning content. However good learning environments support and encourage better practices – both for the instructor and the learner.

FEATURES OF MOODLE

Moodle is a free, web based and open source LMS developed in PHP with MySQL as an underlying database. Benefits comprise ease of use, improvements on to suit the users' evolving needs, localization (about 95 language translations), customization to conform individual needs and a high level of data security. The flexible architecture of Moodle permits a high level of integration with different modules and systems. However as Moodle is highly customizable, this requires significant technical proficiency of PHP technology and a dedicated programmers' team to manage the back-end working environment. It is not easy to administrate Moodle only by yourself. The installation includes the creation of a Web site and Web interface to gain access to the system's capabilities. At the same time, the system needs powerful hardware to achieve better efficiency. As it concerns the maintenance, a large international group of users and developers supports Moodle.

In its standard installation, Moodle offers tools concerning:

1. User management – registration, authentication, activity tracking, etc.

2. Course delivery - test types, automatic test support, grading, course menu, course management, assignments, online gradebook, etc.
3. Communications - discussion forum, file exchange, mobile access, blogs, lecture recording, etc.
4. Content development - course templates, customization, instructional design tools, standards compliance, etc.
5. Productivity - calendar, progress review, work offline, module page, etc.
6. Student Involvement - group organizing, wikis, student portfolios, etc.

In Moodle, assortment of “plug-ins” and “add-ons” extend the platform’s basic functionalities. A set of learner-centered tools facilitates collaborative learning and personalization thus making this infrastructure suitable both for face-to-face and distance forms. Meanwhile Moodle is far more intuitive and permits good housekeeping when the course tends to become disordered.

Moodle’s single page unit based structure facilitates a modular design that permits to improve the overall functionality by adding new components (Fig.1). My Courses panel lists courses that you either teach or attend. Moodle presents the whole course on the same page split into units defined by the instructor. The organization of the learning material is by week or topic, like a regular class syllabus. This format permits the instructors to decide what activities to do week by week or unit by unit.

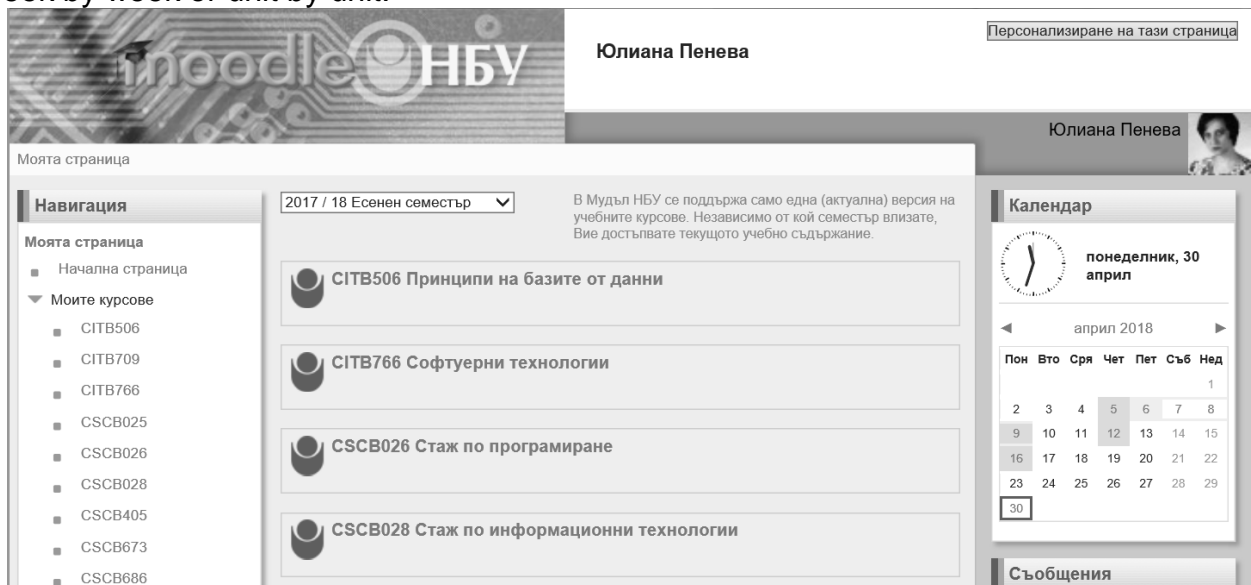


Fig. 1 Moodle My Courses panel

Moodle supports Social Constructionist pedagogy [7] that stimulates collaboration, critical thinking and task-based learning. Students create own profiles and they can track colleagues who are also online. There are wiki’s and other tools that allow the production of collaborative objects.

PROVEN PRACTICES FOR BETTER E-LEARNING

To administer e-learning at New Bulgarian University the open source learning management system Moodle has been implemented. The proprietary university integrated information system delivers the rest of activities concerning the overall learning process. The rationale behind the choice of Moodle conforms to the following system features: modular course design; interface in Bulgarian; applicability for in-class, online and blended course delivery models; use of social constructionist pedagogy that stimulates collaboration, critical thinking, and task-based learning; courses can be easily searched, etc. During the process of implementing the chosen solution, we arrived at some good practices, which ensure good results. We would like to share some of them:

1. Integrate Moodle with the proprietary information system
When deciding to deliver a technology-enhanced learning process, most universities probably possess information system that gives basic information services. A good quantity of the needed information about courses, programs, lecturers, etc. is somewhere stored in and might be placed at Moodle disposal, as it is time consuming to reenter all

these data. Integration between the information and learning management system is preferable. At NBU a close interoperability with the university information system has been established thus ensuring a strict control over the course enrolling.

2. User interface

The user interface is among the most important aspects of an e-learning course. It includes many components: menus, buttons, images, color scheme, and the overall look of the page. User interface design is a complex task. Nevertheless, it might be hard to achieve, the interface has to be simple allowing quick and unambiguous access from one component to another. It is easy to complicate the course design e.g. to give several ways to advance on the learning content. The well-designed interface should provide a clear path forward and consistency across the course. As Jakob Nielsen [8], usability expert states, "Users don't care about design for its own sake; they just want to get things done and get out. Normal people do not love sitting at their computers. They would rather watch football, walk the dog—just about anything else. Using a computer probably rates above taking out the trash, though."

Consider the various social networks – they permit the users to reach items they are interested in straightforward. Learners take care about their courses, assignment deadlines and other events concerning their training. Moodle provides tools to design a simple personalized entry page containing data about current online users, calendar of events, assignments and deadlines, attendance statistics, latest forum topics to name a few.

3. Right course design to fit delivery through LMS

The policy of NBU is to deliver student-centered and diversified education. Courses at NBU are with a standard size of 30 hours that favor their delivery via e-learning environment. Because of the eligibility of the courses, some overlapping in the educational tasks of the individual courses is necessary in order to guarantee the competences stated by the programs. This, however, makes it possible to minimize the interdependence between their curriculum content. The standard size of 30 hours creates a good granulation of the curriculum to achieve limited and balanced educational goals. These goals can be realized through learning activities in which the trainee's own work is the leading role. Analyzing the audience and understanding their needs is very important for instructional design.

4. Suitable student-oriented course content

The final objective of any educational program is to assure learners' proficiency and to develop further interest in the subject. Therefore, instructional designers have to develop course learning content. In fact, the main effort consists of e-learning content preparation and presentation. Probably there exists a set of materials for a specific subject e.g. lecture notes, presentations, images and graphs, case studies, etc. These training materials cannot be used directly by just making them available from a Web site. After the start of e-learning at NBU most of the lecturers offered plain text or scientific papers as course content. However, e-learning differs from face-to-face training and requires specific formats - video lectures, presentations, serious games, interactive simulations of real processes, collaborative work. It is necessary to adapt existing materials to the new learning environment.

Course development traditionally follows the product approach: instructors design the course according to their understanding of the course material. Curricula and courses' syllabi are available at the university site. Before the start of the academic year syllabi are revisited and if necessary updated. Students become aware about the learning objectives, topics to be covered, reference materials, course schedule and learning activities such as assignments, case studies, discussions, tests, etc. Content development conforms to the syllabus. The planning of suitable learning activities for trainee's self-dependent work with the available learning content is also essential. Multimedia and interactivity inherent to e-learning lead to temptation of focusing on the diversification of forms used to present the learning content.

According to the modular approach, we divide the learning content into units of instruction or themes. Each module consists of a unit overview, objectives, student

directions – prerequisites, key words, theoretical concepts, lecture notes and presentations, readings, glossary, discussion questions and activities – tasks, inquires, test elements, problems for self-assessment, etc. Any task is composed of: competences acquired after finishing it, key words, definitions, a possible solution, implementation examples, supplementary resources - links to company's websites with tutorials if any, extra readings, etc. We also observe the principle of encapsulation, i.e. minimum references to other courses and facts outside the content thus reducing the dependency of a casually missing knowledge. Instead, short context related definitions and explanations can be included, if applicable. In this way, we try to achieve a maximal independence among the different courses and to make easy different configuration of curricula. The main didactical issue is to retain the unit volume in admissible size when the complexity grows. In addition, the content should influence trainees on an emotional level and deliver the right amount of complexity.

5. Interactivity

Interactivity in e-learning makes for learners' engagement in the educational process and facilitates active learning. Providing quality content is the key step when designing interactive e-learning. Chris Pappas [9] defined it as the "dialogue between learners and e-learning tools through which learners become engaged and involved in the e-learning process."

Good interactivity makes the learner an active participant in the course as it can range from multiple-choice quizzes, tests, e-learning scenarios, simulations, animation videos etc. Interactivity facilitates the learning of the course content. In addition, it encourages reflection and promotes student motivation. There are four levels of interactivity:

- passive with little or no interaction e.g. simple images, videos, test questions used to introduce concepts;
- limited – offers the trainee some control over the advance of the learning process via navigable menus, animations, multimedia, interactive exercises; it is used for basic skill development;
- moderate – the trainee has much more control over the learning process via customized audio, simulations and branching; it is applied for teaching problem activities;
- full - the trainee has the highest degree of control over the learning process via complex animations, gaming technology etc.; it is applied when the learners are expected to apply their knowledge in real life situations.

Not all types of interactivity are equally effective. It depends on the subject, the audience type and the technical infrastructure.

6. Assessment

Learners are assessed on the subject during the semester (current control) or at the end of the semester. It depends on the type of the audience. The final grade is based on at least two components (individual grades), and for each grade at least two forms of assessment (e.g. a written and practical part of a written test) are applied. Students can skip the final exam if they participate successfully in the current control. Most students benefit assessment during the semester. In this way, we achieve the active participation of the students in the training process. Students who prefer examinations at the end of the semester either work or have failed during the current control.

Moodle facilitates both current and final assessment as the system offers opportunities to test students' knowledge and competence via online testing. Online exams permit more scheduling flexibility for both students and faculty [10]. Although setting up the question bank is a time consuming activity, test elements can be reused and students' exams are automatically graded. Furthermore, the immediate scoring of online exams permits students to receive a rapid feedback regarding their achievements. In addition self-assessment test becomes possible.

We find especially useful the feature of Moodle to track the individual student's activity. Examining the registers, we have a reliable feedback about the students' actions. In addition, the uploaded students' assignments can be easily checked against plagiarism

and other forms of scholastic dishonesty (Fig.2). In addition, for each course topic the possibility for assigning a weekly online activity: discussion, group project, peer feedback, etc. is highly productive. We ask students to make posts and to participate in different forums. The electronic evaluation of assignments permits the instructor to send personal comments to each student for better understanding.

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Предадена за оценка	Оценка	Редактиране ▾	четвъртък, 25 януари 2018, 12:39	INFM305_Proekt2 58.5% Report Type:
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Fig. 2 Originality report

7. Training of the lecturers

Lecturers anyway need training, as they have to create learning content. Clearly, this will require special and extra effort. If this fact is ignored, the introduction of e-learning will fail. Lecturers appear in a new role namely as scriptwriters and filmmakers. They build "story lines" on which learning content can be acquired. Competences have been defined explicitly to facilitate learners' navigation within the coursework and their choice of the learning path.

At NBU lecturers are trained on the features of Moodle that facilitate their work e.g. how easily to set up group or personal tasks and track their performance or how to deliver extra learning content. Common teaching techniques are applied with regard to the specifics of e-learning. For example, "exposition" can be varied with interactive exercises. The "active method", i.e. non-guided learning, can be implemented as performing different tasks working in groups or individually. When "demonstration" is implemented, the learners repeat the demonstrated activity, supported via instructions transmitted by communication devices.

8. All courses simultaneously available via Moodle

We carried out a special investigation on students' readiness for e-learning [11]. We can conclude with confidence that they are ready to take various courses delivered via a LMS. Moreover, students suppose that learning content for every course will be available via Moodle. They expect to find up-to-date information about the course schedule, assignments, learning content, etc. They would be disappointed if only some courses are offered via the LMS. For this reason, we give the possibility all the lecturers to work with the LMS. For all curricula, a frame from blank courses is provided. Lecturers can fill in, modify the learning content, and prescribe convenient learning activities. Certainly, some instructors remain skeptical and prefer traditional lecturing. The University provides various incentives to e-learning contributors. Summarizing, e-learning is to be implemented fully for all programs offered by the university.

CONCLUSION

The new digital information age is technology-driven and requires literate, communicative, and collaborative people capable efficiently to learn by themselves. Universities have to prepare their graduates for this future. Learning should be available "anytime, anywhere", and for any motivation. For this reasons a transition toward e-learning, i.e. a technology oriented training, ranging from a technologically oriented face-to-face classroom to fully online setting becomes necessary. The technology infrastructure of the university learning system is to be dynamic, innovative and sustainable. The use of an e-learning system is a key factor in ensuring the quality of the education offered.

In this paper, we shared our experience in introducing e-learning at New Bulgarian University. We comply with the University's policy for student-centered and diversified education. The optional presence of students during the regular classes and the fact that most of the courses are elective also influence the instruction and assessment. E-learning instruction should be motivational, student-centered, authentic and contextual. E-learning testing should show students' knowledge, creative thinking and analytical skills. We summarize some good practices in conducting regular and distance training. These practices are the result of the specifics of the subject areas and the learning process.

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