DESIGN OF VIDEO LECTURE IN BIOLOGY TEACHER TRAINING

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Abstract


Today, technological trends in informatics and telecommunications are behind a new change in educational service provision – from e-learning to mobile learning (m-learning). New technology provides users with opportunities to communicate and access information, learning content and services everywhere, at any time. Their use in the process of professional training of students enables universities to offer flexible training and better quality. In this paper main goal is to present several modern technologies and their educational opportunities. This article presents an idea how to organize education process with new technology. Finally, it considers a platform providing opportunities to students to diversify learning according to their own needs using text, audio, and video educational materials.

Key words: video lecture, training approaches, principles of design

Introduction

In recent years, new approaches and strategies for teaching and learning are being applied because of the rapid development of information and communication technologies. Applying modern information and communication technologies (ICT) enables universities to offer flexible training while aiming for high quality learning (Garrison, 2003). This trend is more commonly seen in the preparation of future teachers (including of biology) using a variety of learning opportunities. Moreover, emphasis is placed not so much on the specifics of the technology as a learning tool, but on the specifics of the pedagogical possibilities of one or another technology in the preparation of professionals in diverse educational contexts. (Kafai at al., 1996). For decades in Bulgaria the training of future biology teachers was dominated by a traditional approach to organizing the learning process using traditional methods of teaching and learning. This approach precludes individual training, flexibility in the choice of methods and forms of education according to learning style, ability to regulate their own learning progress and not least the ability to train people with disabilities.

As regards the relationship between technology and the quality of education, two main trends are defined: one is related to the modernization of the educational system, and the other – finding an innovative way to improve the teaching process. In literature modern educational technology is characterized by the following features:

– the technology is being developed in conjunction with a specific pedagogical concept and is based on a methodological, philosophical position of the author;
– the activities, operations, communications are carried out in accordance with the purpose and take the form of an expected results;
– phased planning and consistent application of the elements of the educational technology need – on one hand, easy to reproduce by each teacher, on the other – ensure achievement of the planned results by all students;
– an integral part of educational technology are diagnostic procedures containing criteria, indicators and tools for measuring performance (Pickett, 2001).

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Methods

We use following methods theoretical analysis and synthesis, modeling, surveys, statistical methods. To determine the attitudes and opinions of students regarding the application of modern technologies in their professional training, a survey specifically designed for this purpose was conducted. The survey asked 3rd and 4th year students from the Faculty of Biology (program “Biology and Chemistry” and “Geography and Biology”), about the application of technology in their professional training. In this survey took part 50 students from Faculty of Biology. The following results were obtained (Table 1):

Results and Discussion

Generally the respondents agreed that the use of modern technologies in teaching allows the teacher to realize diverse pedagogical designs of the curricula in accordance with the age of the students and the specifics of the learning environment. In most cases an interactive learning content can be started in different ways and have a different structure. It can be designed in such a way that there are multiple ways of viewing the content and reach certain information. The analysis of the survey results allows to derive the main reasons for integrating modern technology in the process of professional training for future biology teachers. Those are generally associated with the following:

- enriching the educational environment in which learning takes place;
- the effectiveness of interactive methods and strategies of teaching and learning in the context of various technological capabilities of one or another technical mean;
- multisensory presentation of information;
- last but not least, the possibility for immediate feedback.

The content of the core courses for biology school teachers is usually more abstract in nature, accompanied by practical and for successful learning active interaction between teacher and students is important. Therefore, mixed type of training – a combination of attendance and e-learning (blended learning), is suitable for those students. Depending on the curriculum, various activities can be combined: lectures, group work, exercises in an electronic environment with interactive components, workshops and more. Here we present a working model of a pedagogical design of video lectures for the professional training of biology teachers (Figure 1).

Table 1. The attitudes and opinions of students regarding the application of modern technologies in their professional training

<table>
<thead>
<tr>
<th>Statements</th>
<th>BCh, FT, 3 and 4 year</th>
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<th>GB, FT, 3 and 4 year</th>
<th>GB, PT, 3 and 4 year</th>
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<tbody>
<tr>
<td>Choice of individual learning strategy.</td>
<td>4.08</td>
<td>3.53</td>
<td>3.58</td>
<td>4.56</td>
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<td>Increased professional motivation.</td>
<td>4.15</td>
<td>4.94</td>
<td>4.28</td>
<td>4.88</td>
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<tr>
<td>Opportunities for flexible training in terms of time and place.</td>
<td>4.15</td>
<td>4.29</td>
<td>3.94</td>
<td>4.72</td>
</tr>
<tr>
<td>Easy access to course materials and resources.</td>
<td>4.31</td>
<td>4.18</td>
<td>3.57</td>
<td>4.52</td>
</tr>
<tr>
<td>Opportunity for convenient structuring and updating of material.</td>
<td>4.31</td>
<td>4.76</td>
<td>4.04</td>
<td>4.48</td>
</tr>
<tr>
<td>Possibility for efficient search and retrieval, selection and evaluation of the usefulness of information from various sources.</td>
<td>4.38</td>
<td>4.35</td>
<td>4.28</td>
<td>4.68</td>
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</table>
Design of Video Lecture in Biology Teacher Training

- a brief description of the module;
- maintaining high video quality;
- a platform generating different image sizes and video quality for different environments: online, local, in various GSM networks.

When creating video lectures, it is essential to follow some basic principles related to the design of educational information and multimodal learning processes. These are generally related to the following:

- Principle of multimedia – retention is improved by the use of words and images, compared to only words (double encoding).
- Principles of spatial continuity- students learn better, when words and images are placed close to each other.
- Principle of continuous time – students learn better when corresponding words and pictures are presented simultaneously, compared to contiguous presentation.
- Principle of coherence – students learn better, when the superfluous words, images and sounds are removed from the multimedia content.
- Principle of modality – students learn better through animation accompanied by voice, as compared to animation accompanied by text.
- Principle of redundancy – students learn better when information is presented in a single modality, excessive repetition interferes with the learning process.
- Design principle – the influence of multimedia design over entry-level students is greater than over advanced learners.
- Principle of direct manipulation- the influence of changes in the speed of the animation or broadcast on the transfer of knowledge increases collinearly to the complexity of the material.

Design of video lecture with learning activities

Pedagogical design of a video lecture could be done using the following algorithm:

- define learning objectives accordingly formulate a few basic types of activities (e.g. formation of new knowledge and skills, control, self-control and verification of knowledge and skills, assessment of the level of acquisition of knowledge and skills);
- adapt the activities to the used learning styles;
- deconstruction of the individual actions and operations constituting the structure of the activity;
- technologically and functionally provision the activity for the appropriate mobile device.

Conclusions

Applying a video lecture in teacher training for future biology teachers is one of the challenges facing education. Successful implementation requires prior information regarding the technological parameters and characteristics, as well as the educational opportunities offered by specific technologies in realizing educational goals in formal and informal contexts. The technology ensures reaching the projected goal, which is an indicator of quality in education. This is certainly an important factor for enhancing the competitiveness of Bulgarian schools and universities and making them a key driver for reform of the educational system in the direction of contemporary paradigms.

References