

Feedback influence to development of pedagogical competencies of doctoral students

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Grant: ITMS 26110230019

Název grantu: Rozvoj znalostných a pedagogických kompetencií pracovníkov vedy a výskumu a doktorandov na UMB v Banskej Bystrici

Oborové zaměření: AM - Pedagogika a školstvo

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Abstract This paper presents main acquisition of the project which enhance knowledge and skills of university teachers, scientific researchers and PhD students. The project implements several training courses for distance learning and e-learning in various fields. In this paper we focus on how to prepare the younger generation of teachers for the best usage of modern technologies in the teaching process. We show that it is very important include to the teachers work feedback. In this paper are designed and implemented four models of feedback and all these models help us build up life cycle of the course.

Key words Distance learning, e-learning, LMS Moodle, feedback, life cycle of course

1. INTRODUCTION

The rapid development of new technologies and a huge amount of information and information resources requires people who are ready for such information environment - are competent, literate and have knowledge and skills needed for the 21 century. Therefore, in our project, big emphasis and attention is paid to the actual work with new information and communication technologies in the course. Matej Bel University wanted to enhance the knowledge of the challenges involved in OPV-2009/1.2/01- IBMA and succeeded with the project "Developing the knowledge and skills of teaching staff and scientific researchers and PhD students at MBU in Banská Bystrica". The project implements progressively several training courses for university teachers and researchers in various fields, such as: statistical methods, courses in English and Latin language, effective communication skills, planning and management of scientific research activities, electronic presentation of research results and intellectual property protection. In most courses dominates the effort to use the last scientific knowledge and the most modern digital technologies. The participants learn to edit large documents at the professional level. They can analyse complex databases and analytical results presented in the form of tables and graphs. In their work, they can use built-in tools into MS Excel: Pivot Tables, Solver, Scenarios, Goal Seek, etc. Very useful for teachers is to work with LMS Moodle, where they learn to prepare their own courses, publish teaching materials in various formats and prepare tests and questionnaires to obtain feedback from the students. A special category of courses is for graduates, which is

designed to develop their teaching skills and modern technology in education. The last mentioned course is described in our contribution.

2. THE COURSE OF MODERN TECHNOLOGY IN EDUCATION

In this part of paper we describe the target group, base information about the course, goals and structure of the course.

2.1 Base information about the course

The target group is doctoral students of MBU. The most of them have no teaching qualification and they are required to lead seminars in the range of 4 hours per week. It is expected that after successful completion of doctoral studies they will participate in the educational process.

There was a plan to have educated maximum 100 participants after finishing all runs of courses. The courses are realized during the 5 terms between the years 2011 and 2013. In one term each course will take 65 teaching hours, parallel in two groups. And there will be 10 participants in each group. The adequate material and technical equipment needed for the realization of the training course is: data projector, notebook, videosoftware, software for e-learning, etc. To support the course, also textbooks were printed, which are complemented by other supplementary materials stored in e-learning environment Moodle.

2.2 Goals and structure of the course

The course aims to understand the basic concepts of modern education, psychological aspects of a group and also individualized learning, which allows developing a model course, the scenario and the actual online course. The aim is also to show the students how to properly specify the objectives of the course, to incorporate motivating and activating elements into the course, evaluate the level of fulfilment of goals and also make self-evaluation and follow-up course in the meaning of the life cycle of this course. All these goals should present innovative forms of education, new educational methods, the use of e-learning, management of training and creation of new possibilities for education. [7]

The MTE course is divided into three parts. First one, *The methodology of distance education and e-learning*, mostly theoretical, is enriched by practical examples. Second, *Creation of multimedia educational materials for e-learning*, and the third one, *Management of distance and e-learning*, are aimed at practical skills. Course is led by experienced teachers from the Department of Informatics and Mathematics at Faculty of natural sciences MBU and Department of Quantitative Methods and Information Technology at Faculty of Economy MBU in Banská Bystrica.

The part *The methodology of distance education and e-learning*, is organized as three meetings each for 5 hours and presents to the participants the concepts of modern education and introduces some modern forms of education, communication methods and tools of modern education. Our effort is focused on the issue of training, organization and management of distance education courses and methodology of teaching materials and tools in distance education and e-learning [11]. Attention is paid to the methodology of distance learning and e-learning [13, 9, 10]. Participants learn to design (see figure 1) and create models of education and their own courses [6]. We start from ADDIE model (Analysis, Design, Develop, Implementation, and Evaluation) and we deal with tools for creating teaching content, the scenarios, activities, and evaluation. We help them to understand the functions of e-learning, learning objects and the importance of standards [1]. We focus also on issues of copyright in e-learning. To create the scenario we use the software FreeMind and editor eXe for creating learning content. There is a great attention given to this software. Reliable operation of these instruments is an essential starting point for creating high-quality teaching content. We focus also on the colours and image composition. Participants learn to create web pages accessible through web portals [12, 5]. The outcome of the course is to create their own site content or parts of it.

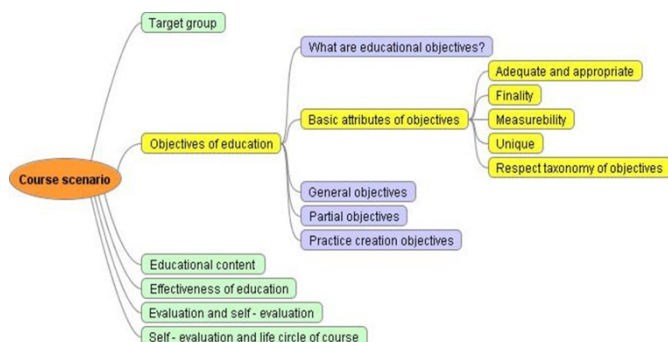


Fig 1. Design of basic educational scenario

In the next section, *Creation of multimedia educational materials for distance education and e-learning* is organized the same way as the first part. We place there the biggest emphasis on performance study materials and aids for distance learning [3, 4]. We use available multimedia tools, which are programs for acquisition and processing of individual media elements (text, images, sounds, animations, but here mostly video) and programs for the creation of the final study material [14]. We use especially the software CamStudio, or Camtasia Studio for creating videotutorials, Windows Movie Maker for video processing and PowerPoint or Adobe Captivate as authoring tool for creating educational interactive presentations or applications.

The third part, *Management of distance and e-learning*, is organized as seven meetings each for 5 hours. It presents to the participants the management of distance learning and e-learning and the practical guidance of the Moodle courses. Our goal is to provide teaching advice in creating a variety of activities in Moodle system. In the early chapters we show a fairly detailed description of activities to create a new course. These activities are presented with several

specific examples. We gradually reduce exhaustive description, and we leave more area for independent work.

At the end of the course, the trainees are doing tests from individual programs. Teachers of individual courses are evaluated through anonymous questionnaires at the last meeting. At the end participants obtain certificates of the course. So far, the course has been completed and appreciated by the trainees.

3. LEARNING MATERIALS

Three textbooks were created in framework of the project *The development of pedagogical competencies of doctoral students* and they were published with the support of the European Social Fund and the Matej Bel University in Banská Bystrica under the terms of the mentioned project.

The first textbook in the series, titled *The methodology of distance education and e-learning*, introduces basic concepts, forms, communication approaches and tools of modern education theory and practice [13]. It is focused on psychological aspects of education that are associated with distance and electronic learning. The attention is fixed on educational objectives, their formulation, assessment and consequences. Effective education can be characterised by student's motivation, self-action and creativeness. We apply these elements in the manner of targeting the student. Although the modern education is aimed at the student, teacher still plays a crucial role in it. The evolving roles of the teacher are explained here. Special attention is devoted to how to design and create models of distance learning education and electronic courses. Students can practice with tools for creating educational contents from scenario through activities to evaluation. There are described functions of e-learning systems, educational objects, as well as the meaning of standards. Questions of author's law in e-learning are also addressed.

The second textbook is titled *Creation of multimedia teaching materials for distance education and e-learning*. In this textbook, we introduce the most important tools of modern forms of education, among which we can include the Internet and multimedia in particular [8]. Here we specify properties of media; we introduce the functions of the media elements in multimedia applications. We are familiar with multimedia hardware and software, and we also approach the process of multimedia applications. We talk about real video editing software through Windows Live Movie Maker. We also present a method of continuous media, necessary hardware and software tools to implement it and show the steps through the creation videotutorials by help of CamStudio software. In the last part of this textbook, we explain the concept of authorization and authoring systems, and we look into the PowerPoint environment in terms of working with multimedia. We show how to insert individual media elements, provide interactivity and animation of objects on a slide and create non-linear presentation.

The aim of the third publication *Management of distance and e-learning* is to develop methodological tools for teachers who are planning on using new information and communication technologies in their teaching practice. Our methodological tool has not been written as a guide to work with Moodle. Instead, our aim is to provide teaching advice in creating a variety of activities in this system. In this work we suppose that the reader has the rights of the creator of the course in the Moodle system. In the early chapters, relatively detailed description of activities how to create a new course is served. We devote considerable attention to the activity: Lecture and also to the activity Formation of questions. These activities are presented by several specific examples. As we mentioned before in this part we leave more space for independent work. From our own experience we came to a clear conclusion: To establish a well-functioning educational activity in e-learning

courses we must click many times through the assistance provided by Moodle.

4. EXAMPLES OF THE COURSE ACTIVITIES

According to the division of the course we consequently describe activities of each part.

4.1 First part of the course

After passing the theoretical part students practice with software tools FreeMind (for creating course scenario based on mind map) and software editor eXe (for creating educational contents and design educational activities.) and start to do following discussions and activities:

Create mind maps to chosen topic and talk about the structure of electronic course.

Discuss the composition of the scenario in order a model of scenario.

Activity 1: Create a scenario of course you teach. Focus on one small unit of the tutorial.

Activity 2: Specify the proper educational objectives of the proposed course and bring them into the script.

Follow the joint assessment of scenarios, the proposed targets and their analysis.

Familiarize with the basics of software eXe.

Activity 3: Create a course according to scenario and prepared teaching materials.

Talk about effective teaching with the aim adequately divided on educational content, and properly design and include activity and tasks for independent work.

Activity 4: Divide the course, design activity and place them correctly. When designing activities, emphasis on independence and creativity is important.

Activity 5: Add evaluation activities to the created course.

Activity 6: Divide the course into individual learning objects and according to the SCORM create learning packages.

Activity 7: Make a self-evaluation and according to it adjust the course scenario.

Summarize the first part of the course.

4.2 Second part of the course

After first introduction with media elements, multimedia hardware and software and the development of multimedia application, we focus on creation of video. At first it is real video processed in Windows Movie Maker and then it is virtual video processed by CamStudio.

Activity 1: Create a short movie in Windows Movie Maker showing the assembly and disassembly of the old keyboard. At the beginning of movie insert a picture of Pat and Mat, and during the whole movie release music of this famous tale. Between each image insert transition effects. Adjust the length of the movie to the length of the song (it takes 1min17sec). To the end insert the subtitles with the names of the team of authors. Save the file in the WMV format to a predetermined directory. The topic of the movie can be changed according to the activity related to your research area. [7]

Activity 2: With the help of software CamStudio or Camtasia Studio create a short videotutorial illustrating a simple course of action in any software. Add the video to your voice comment. Save the file in AVI format to a predetermined directory. Choice of software environment can be adapted to the needs of your research work. Dub your videotutorial into English or another foreign language.

Activity 3: In MS PowerPoint create a presentation on a topic from the subject that you teach. The presentation will be nonlinear with a

complex structure, containing the main menu and hyperlinks to various slides. This presentation is designed for self-study and will include not only text and images but also real or virtual video, sound and animation.

4.3 Third part of the course

Our common goal in this part of the course is to create an electronic course in system Moodle. We assume that the user has at least rights of the course creator in Moodle. For this purpose we use a work server located at <https://lms2.umb.sk/course/view.php> on which Moodle is used for improving work-course creators. Administrator allows students to request temporary assign role makers of the course. Introductory block of course must include background information about the course structure and method of study. First, it must contain: 1. Thematic course plan, evaluation method and conditions for obtaining credits for successful management of the course. 2. Space for communication with students and teachers of the course - discussion forums, latest news, calendar of events. 3. Separate study unit for support – presentations, e-lectures and so on. 4. Assignments - tasks, written work, seminar work and the results of their continuous assessment. 5. Block for additional subsidiary study texts and teaching materials. After creating a new course, students learn to administrate this course and add to the course resources and learning activities in the form of electronic lectures, tests and assignments. To create the test, the database with plenty of prepared questions is required. In the end the students learn about the possibilities of communication in the course. They can try two ways to communicate with each other during the course.

5. LIFE CYCLE AND MODELS OF COURSE FEEDBACK

In accordance with the plan, we have gradually realized 5 courses. The whole process started during the year 2011 and takes 4 semesters. In the first term we did two runs of courses and other times only one course per term. There are the fifth and final run of the courses before us. Experiences, self - evaluation of teachers and feedback information from students are always incorporated with the next run of the course. This course continues to evolve and so we can talk about the life cycle of the course. We have proposed four models of feedback from course participants.

Feedback model 1 – it is a model of the immediate feedback and we have received it directly in the running of the course activities. During the activities of the course there are many possibilities to gain feedbacks from students. The teacher puts the questions that lead to responses how the activity is appropriate for using in doctoral students practice or from point of his/her background. The goal of this feedback is to set up appropriate number of activities and to review if they are focused to the aims that teachers have planned. Some examples of questions and responses: *Question 1: How do you use the activity of creating mind maps in your teaching subjects? Answer 1: It is very helpful. I will use it in my preparation of structure of subject and inside of the structure in themes. Answer 2: I can use it in my doctoral work. There is very complicated structure. I can visualize it and package some parts of it.*

Feedback model 2 – it is a model of feedback that we receive during the period of the course. This means that the proposals and comments can be incorporated still running during the current course. The students use modern tools for communication. They use synchronous and asynchronous communication. Synchronous communication runs in real time, participants can chat with each other and with the teacher too. We have prepared for this reason chat room in the Moodle. Asynchronous communication does not realize in the same time. We have prepared the forum in the

electronic course. It is open for every participant of the particular course. Teacher sees and moderates discussion. The students often use university mail service for communication and send their projects. Some examples of questions and answers: *Question 1: What do you generally like on courses in LMS Moodle? Answer 1: Availability of information, easy access to learning materials, discussion forum, easy to use, user friendly environment, movies with solution of tasks.*

Question 2: What do you find most useful in courses for each subject? Answer 2: Electronic presentation of lectures, electronic teaching materials, general information about the subject, notices, instructions for students, movies with solution of tasks, hyperlinks to other sources, easy transfer of seminar papers.

Question 3: How can I put the web content to Moodle without using of external links? Answer 3: You can use SCORM package.

Question 4: Why did you bring just this presentation to the consultation? What was your motivation? Answer 4: Especially the effort to improve the presentation normally used for teaching purposes.

Feedback model 3 – it is model of the feedback that we get at the end of the course. This model of feedback is realized as a questionnaire that participants fulfill after the course. There are three groups of questions and two general assessments. The first part of questions is related to the content of the course and second one to the evaluation of teachers. Third part of questions is about progress feelings. The questionnaire is shown and evaluated in next part of this paper.

Feedback model 4 – it is model of the feedback that is built on opened questions about experiences from using knowledge, incorporating skills in doctoral students teaching or other activities. Some examples of questions and answers:

Question 1: How do you use the experience in creating video tutorials in your practice? Answer 1: I made a preparation of activities in various software and recorded them step-by-step.

Question 2: What advantages do you see in usage of real video in your teaching, or scientific work? Answer 2: For example, when analyzing student errors made during their teaching practice, which was recorded by camera.

Question 3: What is the biggest help of this course for you as a teacher? Answer 3: Teachers' advice and information about how to apply and improving the activities to subject of my teaching. My students are more motivated, more activated and usage of technologies speeds up my work.

Question 4: What has been the most beneficial during the Course - Creating of multimedia teaching materials? Answer 4: Another point of view into the usage of multimedia technology in education and practical skills in video processing.

Question 5: What are the main advantages of learning through Moodle from teacher's point of view? Answer 5: Availability of required course materials, individual pace of learning, independence of time and place, greater involvement of students in the educational process, elimination the cost of travel and attendance at presence consultations (external study), ability to communicate with other students and teachers, feedback.

Question 6: What are the main disadvantages of learning through Moodle from teacher's point of view? Answer 6: Dependence on computer technology and possible technical problems, the existence of difficulties associated with control technology, elimination of human contact and communication, lack of confidence all the material on the Internet, large amount of information resources for the study and the associated time-consuming.

Question 7: What are your comments, suggestions and observations towards teaching with using of Moodle? Answer 7: Teachers should use Moodle more, improve design and graphics of Moodle, early publication of educational materials - before teaching.

6. THE DEVELOPMENT OF PEDAGOGICAL COMPETENCIES OF DOCTORAL STUDENTS

This part of the paper is about evaluation of feedbacks. In accordance with our goals we have incorporated our experiences, self – evaluation and answers from feedbacks in particular times. Answers from feedbacks 1 have inspired us to make changes in activities of course and till next run of course we have modified them (courses). Communication and notes from feedback 2 we included into next hours of course. The third model of feedbacks - the questionnaire was evaluated after finishing of every course. Every participant is responsible to fulfill evaluation form. There were 48 participants and all 100% have evaluated the course content, teachers and feel of progress. Participants are doctoral students. They are between 25 and 30 years old. They are clever and in works with ICT and are interested in to gain new knowledge. We have reached all the educational goals we have set. There are questions from questionnaire (left side) and average evaluation after last course (right side) of table 1. Degrees of the evaluation are: 1 - I'm very satisfied, course were excellent, 2 - I'm satisfied, course were good, 3 - I have minor complaints, course were medial, 4 - I have more complaints course wasn't good, 5 - I am completely dissatisfied.

Table 1 Question from questionnaire (left) and average evaluation after 5th course (right).

1. COURSE CONTENT	Average rank				
	1	2	3	4	5
<i>The subject matter was actual with hierarchy ordering:</i>		■			
					1,2
<i>Information were presented by manageable parts:</i>		■			
					1,1
<i>The subject matter was divided into meaningful units of learning:</i>			■		
					1,3
<i>The subject matter will be useful for me in practical life:</i>		■			
					1,1
<i>The course helped me to clarify the topic:</i>		■			
					1,2
2. TEACHERS EVALUATION	Average rank				
	1	2	3	4	5
<i>Teachers' interpretations were understandable and clear:</i>			■		
					1,4
<i>Teachers created sufficient space for questions and discussion:</i>				■	
					1,5
<i>Teachers adequately used teaching aids and equipment:</i>				■	
					1,5
<i>Teachers connected theory with examples from practice:</i>			■		
					1,4
<i>Teachers made space for practicing new knowledge:</i>			■		
					1,4
3. FEELS OF PROGRESS	Average rank				
	1	2	3	4	5
<i>I gained important new findings:</i>		■			
					1,2
<i>I have developed new skills in this area:</i>			■		
					1,3
<i>I understand how to solve</i>		■			
					1,2

problems:	
<i>I believe that my power will be improved in the workplace:</i>	■ 1,4
<i>I will use in practice what I have learned on the course:</i>	■ 1,2

Continuous assessment after finishing run of the course show figures 2, 3 and 4. There are evaluations of course content on the figure 2. The worse evaluation was improved of 33.3% and average of every evaluation was improved of 21.4%.

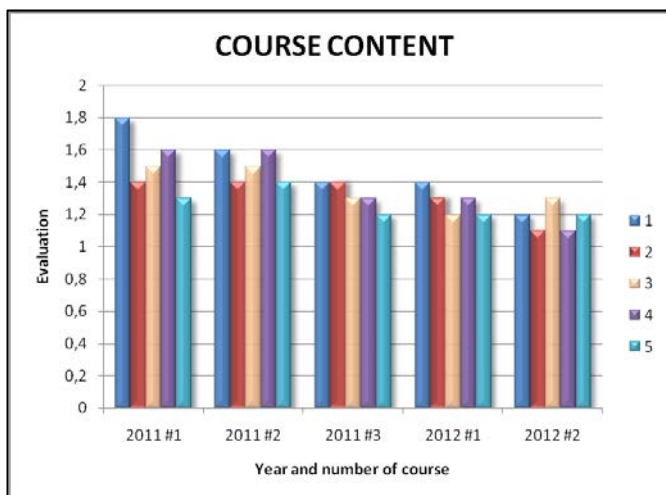


Fig 2. Evaluation of Course content after every run of the course

There are teacher’s evaluations on the figure 3. The worse evaluation was improved of 36.4% and average of every evaluation was improved of 26.6%.

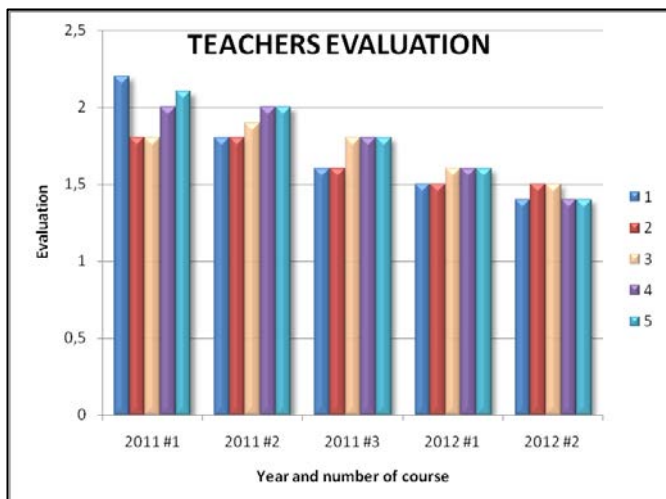


Fig 3. Evaluation of teachers after every run of the course

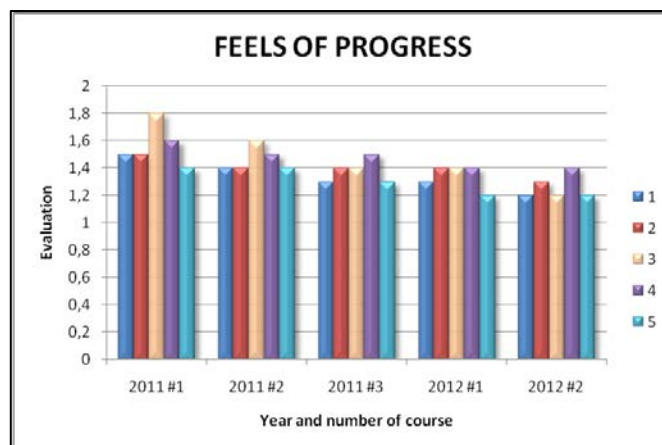


Fig 4. Evaluation of feels of progress after every run of the course

There are feels of progress evaluations on the figure 4. The worse evaluation was improved of 20% and average of every evaluation was improved of 18.7%. Very important is that there is trend of improvement in every of evaluated part.

Other part of evaluation consists of general assessment. There are responses from all 48 participants.

Question 1: *If you take into account all aspects of the course as will you evaluate it? (Choose the best.).* Answers on the question 1 are evaluated and 91 % of responses consider the course as extraordinary good and only 9 % very good.

Question 2: *Would you recommend this course to yours colleagues? (Select as appropriate.).* Answers on the question 2 are evaluated and 100 % of responses would recommend the course to colleagues.

Although numerical evaluation can very quickly show us improvements, it is more important feedback 4 (part 5 of this paper) for us. It tells us how we meet the global objectives of the project. This feedback is dependent of experiences from using knowledge, incorporating participants’ skills in their teaching process and scientific activities. The feedback 4 we find out minimally one term after finishing the course. We have observed that every of key activities and objectives of course are used by participants in their practice. All realized models of feedbacks give us experiences that help us build up life cycle of the course.

7. CONCLUSION

Modern education depends on how to utilize various possibilities of modern technology to improve learning and teaching and therefore it is very important to prepare the younger generation of teachers to best use of modern technologies in the teaching process. Our contribution can serve as a sample of successful launch of prepared educational models into practice. We have shown that it is very important include to the teachers work feedback. We have design and implemented four models of feedback and all these models help us build up life cycle of the course.

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