

The use of active teaching methods in bachelor training

El uso de métodos de enseñanza activos en la formación de Bachilleres

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ABSTRACT:

An active learning method is a form of interaction between students and the teacher in class which implies both student – teacher and student- student communication. One of the most promising forms of realizing active teaching methods is e-learning. Most often e-learning is used together with the traditional classroom education. This type got a name of blended learning. The use of electronic educational resources (EER) in Russian universities, especially in the system of teacher training, has received more and more practical application while there is scarcity of theoretical research. This essay is aimed at investigating methods to improve educating bachelors of teacher education and vocational training. Research methods used in this essay are pedagogical observation, comparison of electronic learning resources, theoretical analysis, and resource study. The research deals with the attitude of bachelor students and teachers at the pedagogical department of the university, to the use of electronic educational resources, and provides an example of studying special disciplines with the use of blended learning, which gives positive results in the preparation of future bachelors.

Keywords: pedagogy, training, competence, electronic,

RESUMEN:

Un método de aprendizaje activo es una forma de interacción entre los estudiantes y el maestro en clase, lo que implica tanto la comunicación entre estudiantes y maestros como estudiantes y estudiantes. Una de las formas más prometedoras de realizar métodos de enseñanza activos es el e-learning. La mayoría de las veces el e-learning se utiliza junto con la educación tradicional en el aula. Este tipo tiene un nombre de aprendizaje mezclado. El uso de recursos educativos electrónicos (EER) en las universidades rusas, especialmente en el sistema de formación docente, ha recibido una aplicación cada vez más práctica, mientras que hay escasez de investigación teórica. Este ensayo está dirigido a investigar métodos para mejorar la educación de los Bachilleres de la formación docente y vocacional. Los métodos de investigación utilizados en este ensayo son la observación pedagógica, la comparación de los recursos de aprendizaje electrónico, el análisis teórico y el estudio de recursos. La investigación se refiere a la actitud de los estudiantes de licenciatura y profesores del departamento pedagógico de la Universidad, al uso de los recursos educativos electrónicos, y da un ejemplo de estudiar disciplinas especiales con el uso de la mezcla de

1. Introduction

Bachelors of pedagogical education and vocational training are key figures in staffing general education schools and colleges in the country. During their studies at university bachelors must develop necessary competences for their future work, which nowadays involves transition from the traditional system of education to innovation (Informational and analytical review; Privalova 2014).

Under the traditional system of training, the student accepts a passive position of a receiver where he can read, listen and speak about certain areas of knowledge. This kind of one-way communication has historically developed due to a certain lack of information and the impossibility of obtaining it in a different way rather than from the lecturer. Traditional teaching system is becoming obsolete and there is a need for a transition to active teaching methods. Active learning allows to develop hard skills and soft skills simultaneously and helps to establish emotional contact between students, facilitates team working abilities and active listening. The use of active forms in the process of training, as practice shows, helps to relieve students of the stress load, keeps their attention by means of changing class activities and keeping focus of the topic of today's class.

The increasing popularity of personal computers and the Internet in the beginning of the 21st century has led to the emergence of many promising methods in education based on the comprehensive use of computer technology, one of them e-learning. Immense possibilities of the informational environment challenge university teachers with the need of updating methodology and didactics of the higher school. Experts emphasize that fundamental and applied scientific research of this phenomenon is necessary in its various aspects: not only in technical, social, philosophical, but also in pedagogical (UNESCO ICT Competency Framework for Teachers). This study deals with some aspects of e-learning methodology in training bachelors of teacher education in universities.

A number of studies deal with the use of e-learning in universities. In the recent years, attention was attracted to the massive open online courses (MOOCs) (Tatarchevskaya 2013; Gaebel, Kupriyanova, Morais and Colucci 2013; Open learning – new interschool project of distance learning).

The analysis of publications on the use of e-learning in Russian universities shows that the most used is the so-called blended learning, e-learning in combination with the classroom activities. With blended learning, up to 80% of the training course can be done via Internet, and the remaining activities are held in the classroom.

The word "blend" in English means "to mix", "to combine". The student gets knowledge both in the classroom and independently, using computer technology. The most active mixed education is developing in the US. In 2000, blended learning was available only for 45 000 American students; in 2009 the number has reached already three million. By 2019, it is planned to have 50% of all school lessons in the US in the form of blended learning. According to the estimates of the Sloan Consortium, more than 60% of American students believe that blended learning is more effective than traditional. We can get acquainted with models of mixed training in studies (Porter 2014; Pizzi 2014; López-Pérez 2011; Blended learning; 2017 trends in e-learning; Mijares, n. d.).

Russian universities mostly use the so-called inverted class methodology. Inverted class implies independent studying of theoretical material by students out of class hours, such as viewing of

power point presentations, video lectures, on-line webinars, etc. Discussion of key points and practical assignments take place in class with the teacher facilitating these activities (Mijares, n. d.).

2. Methods

In the Elabuga Institute of the Kazan Federal University, the Institute of Engineering and Technology has been experimenting for several years with the introduction of electronic resources in the educational process, especially technical disciplines ("Hydraulics and hydraulic machines", "Thermodynamics and working processes of heat engines", "Principles of hydraulic drive. Hydraulic and pneumatic systems", "Transport energy ", etc.). Development of a course requires creation of necessary electronic resources: lecture scripts, laboratory assignments, presentations, video fragments, apprehension tests for monitoring the level of learning. Students with good computer skills participate in course creation.

The next stage of transition to the e-learning assumes active use of the university website edu.kpfu.ru. First, e-courses are created and registered at do.kpfu.ru, intended for development of the electronic courses; second, a newly developed course must pass expertise of the methodological support. After all the noticed flaws are eliminated, the course is transferred to the main site edu.kpfu.ru for use in training. The first e-course developed by the author was "Hydraulics and hydraulic machines" (id = 1636). Later, other e-courses were created (id = 2076, id = 2077).

To create distance learning systems, Kazan Federal University uses Moodle platform (Modular Object-Oriented Dynamic Learning Environment) (Rice, n. d.). Moodle system is widely represented in the global distance learning market, it combines flexibility, reliability and simplicity. In this system, one can create and store e-learning materials and set the sequence of their study. With the access to Moodle via Internet or other networks, students are not constrained by place and time and can move through material at their own pace.

The electronic course on "Hydraulics and hydraulic machines" includes metadata, zero block, list of lectures, wrap-up block.

The metadata includes the name of the course, education program, course curriculum (lectures, laboratory and practical assignments, independent study, in – process control and final assignments, timetable of the course).

The zero block describes working program of the course, list of acquired competencies, a short summary of the course, recommendations on methodology to students and teachers, booklist and glossary, news and forums, etc.

"Hydraulics and hydraulic machines" course takes a 70/30 percent ratio of classroom hours to independent study. 32 hours from 46 according to the work program of the course were distributed as follows: 8 hours for lectures, 6 hours for practical training and 18 hours for laboratory assignments. The remaining 14 academic hours are for independent research.

44% of the total number of lecture hours is allocated for classroom lectures in which the most complex theoretical questions are highlighted and desired outcomes of laboratory assignments used to verify experimentally the conclusions of the theory, are discussed. For technical sciences, laboratory works play an extremely important role, therefore a total of 18 hours allocated for this activity are held in a specialized laboratory with specialized stands ("Hydrodynamics", "Hydraulic machines and drives", etc.).

During laboratory work, students in micro-groups of 4-5 people have the ability to check theoretical assumptions of hydrodynamics and hydrostatics, operational principles of hydraulic pumps, engines and the hydraulic drive. Importance is attached to the ability to read hydraulic circuit diagrams and find the elements on a real stand. The calculations are carried out individually, but the results obtained are discussed together and conclusions are drawn about the feasibility of certain theoretical propositions. Electronic material is also available in the form

of work content description and templates for reporting which can be downloaded from the site. Templates are easy to fill with the values obtained in the experiment and calculated. Results are sent for verification to the site. Students shall also provide written answers to questions in each laboratory work (4 to 6 questions). The content of the questions is given in the instructions for the work. Students who do not have the opportunity to attend laboratory classes are offered an assignment with virtual experimental data.

60% of the planned hours according to the work program are allocated for practice (solving standard problems based on the studied material). Practice is intended for students to memorize key points of the studied theoretical material, become familiar with measurement of hydraulic (physical) quantities, repeat rules of mathematical calculation, rounding rules in approximate calculus, etc. The final block includes control tests with variants.

The final exam is held in class. Final score comprises immediate results as well as other credits earned by the student both in classroom and remotely.

3. Results

Here are some results of the student survey conducted to reveal student attitude to the use of electronic resources.

1. 97% reported they use Internet daily and only 1.5% once or twice a week.
2. 75% of the respondents use the Internet to get additional knowledge and information, 50% listen to music and watch videos, 87% communicate in social networks (VKontakte).
3. Students noted that teachers of technical disciplines tend to use more electronic resources in class than humanitarian disciplines (52% to 35%).
4. The impact of electronic resources on perception of educational information was estimated as follows: 51% reported positive influence; 23% believe electronic resources have minor impact on the ability of perception. At the same time, 35% of the respondents noted that e-learning increases their interest in the subject.

The following questions were aimed at the use of the electronic courses offered on the site of distance learning of the university, edu.kpfu.ru.

Simultaneously, teachers working in the interviewed groups of students were interviewed (17 people). 41% of teachers responded they already offer e-courses on edu.kpfu.ru (one to three), but only as an option for students volunteering to get additional information related to the course.

5. Only 29% of the surveyed students ever worked on the distance learning site, some of them episodically, 42% did not take any part.
 6. Attitude of the respondents to the electronic resources posted on the edu.kpfu.ru website is as follows: a) 36% noted they are satisfied with the possibility of access to educational materials and like the possibility of obtaining additional credits; b) 20% consider electronic courses to be an additional burden; c) 13% do not understand the need to use e-learning in training; d) 31% were neutral.
 7. The next question is about the possibility of using blended learning in full-time programs of the faculty. 49% of respondents answered positively, 22% - negatively and 29% were neutral. When asked about the ratio of in-class activities to distance learning, 12% said they prefer only in-class activities (100 to 0), 45% prefer 80 to 20, 32% prefer 60 to 40, 10% - 40 to 60 and 1% - 20 to 80 time allocation.
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4. Discussion

Results of this short study are in line with the conclusions of other authors (Pizzi 2014; López-Pérez 2011; Blended learning) saying that no more than a half of students actively use or are ready to use e-learning and blended learning. One third of university professors surveyed

showed readiness to create e-courses, place them on distance learning sites and use them in their work.

As the content of the above mentioned electronic resources shows, creation and their effective use requires significant investment in labor and time, as well as high qualification of teachers. Valuable might be to organize training for the teachers on how to create and use electronic courses, as well as seminars for the exchange of experience.

Blended learning can be attributed to one of the modern methods of active teaching. Majority of students taking part in the survey on the use of "Hydraulics and hydraulic machines" electronic course successfully coped with the assignments. 82% of the students gained over 76 points. For the students who studied only in traditional way these indicators were average.

Summary

1. The use of electronic educational resources in bachelor program of the university pedagogical department provides a positive trend towards perception of educational material and improving efficiency of teaching.
 2. Blended learning should be considered as the most appropriate form of education in Russian universities nowadays.
 3. To date, despite MOOCs (massive open online courses) are practiced in Russian universities, they do not seem to play a significant role.
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5. Conclusions

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