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Assessing students' learning outcomes under informatization of professional education

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Abstract

The paper covers aspects of assessing learning outcomes of students using information and communication technologies (ICT). Within a competency-based approach, ICT provides such interactive educational and evaluation tools as forums, cases, web-quests, etc. It was identified that application of ICT in the professional education facilitates presentation of the study results, the degree of mastering competences, and readiness for labour activities. In conclusion, ICT enables students to build up an individual and comfortable learning path and teachers – to update the content of education, give lessons of any type and more effectively monitor the results of students' learning activity.

Keywords: Activity, Competency-Based, Competencies, Professional Education.

Evaluación de los Resultados del Aprendizaje Estudiantil bajo la Informatización de Formación Profesional

Resumen

El documento cubre aspectos de la evaluación de los resultados de aprendizaje de los estudiantes que utilizan las tecnologías de la información y la comunicación (TIC). Dentro de un enfoque basado en competencias, las TIC proporcionan herramientas educativas interactivas y de evaluación como foros, casos, búsquedas en Internet, etc. Se identificó que la aplicación de las TIC en la educación profesional facilita la presentación de los resultados del estudio, el grado de dominio de las competencias, y disponibilidad para actividades laborales. En conclusión, las TIC le permite a los estudiantes desarrollar un camino de aprendizaje individual y cómodo, y los maestros:

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actualizar el contenido de la educación, dar lecciones de cualquier tipo y monitorear más efectivamente los resultados de la actividad de aprendizaje de los estudiantes.

Palabras clave: Actividad, Basada en Competencias, Competencias, Educación Profesional.

1. INTRODUCTION

Since new educational standards have been approved for the present-day professional education, the results of mastering higher education program will be interpreted in a different way. Not only the results of mastering a specific discipline but also a process of developing competencies and readiness of students to participate in labour activity that will be the outcomes of control measures taken. The subject under study proves its relevance that creates a need for justifying the use of ICT means in procedures for assessing competencies and labour activities. The efficiency of assessment will be considered as a degree of fulfilling its functions within a system for controlling learning process, and effectiveness will be seen as the ratio of a degree of fulfilling assessment functions and resources used. Employing activity- and practice-oriented approaches in the process of implementing educational programs and standardizing assessment procedures constitute a major condition for launching the evaluation of competencies and labour activities. Formalization of competencies increases the load on a teacher, with further adverse impact on him, however, it can be compensated through using ICT. Here, there is a

risk of assessing only that knowledge, which is taught. To avoid this risk, the concepts of the roles taken by a teacher and an examiner will be differentiated. The paper will be of interest for academic staff examining the problems of pedagogical assessment of organizing and controlling the learning process. Works by such researchers as Arkhangelski and others served as methodological background for the study.

2. METHODOLOGY

Globalization, standardization, informatization and development of information and communication technologies being the major trends of developing professional education had an impact on currently existing requirements for pedagogical assessment. An achieved outcome of learning to date involves formed competencies specified in the Federal State Educational Standard (FSES) and a degree to which a graduate is prepared to participate in the professional activity, set forth by the Professional Standard, and his independence in decision-making. A professional standard is not a regulatory requirement and is not binding, however, it serves as a reference point to design curriculum and makes it possible to show a student a process of preparations for professional activity.

That is why the results of control activities involve not only the results of mastering a specific discipline or module but also a process

of creating competencies as such. It increases the time to prepare for assessment, increases the time input of teachers to carry out an evaluation, design assessment, development of evaluation means and processing statistical data. Use of ICT and development of information and educational system of a higher education institution solve this problem to decrease the time spent. Considering didactic properties and functions of information and communication technologies, the following may be inferred: didactic properties of a particular training resource including information and communication technologies as such will imply natural, technical, and technological qualities of an object, those of its aspects that may be used for didactic purposes in teaching and educational process (Yashkova et al., 2016). As per the classification of information and communication technologies, three groups of didactic properties will be identified:

– Didactic properties of technologies for presenting learning information;

– Didactic properties of technologies for conveying learning information;

– Didactic properties of technologies for organizing the learning process.

– Didactic properties of technologies for presenting learning information:

– Displaying and conveying information in text, graphic, sound, videos, animation format using e-learning resources;

– Searchable information in question;

– Potential reinforcement of knowledge obtained in skills; opportunity for mastering practical skills;

– Potential evaluation of knowledge and skills obtained;

– Organization of communication with a course teacher;

– Didactic properties of technologies for conveying learning information;

– Preparation, editing, and mastering of learning, learning and teaching, and scientific information;

– Storing and reserving of information;

– Systematization of information;

– Distribution of information in different forms using information and communication means;

– Providing access to information. Potential connection to any e-banks and databases for learning purposes to obtain information of interest;

– Downloading information from various multimedia;

– Didactic properties of technologies for organizing the learning process;

– Simultaneous forwarding of messages to many students;

– Asynchronous exchanging of (text, graphics, sound) information between a teacher and students. Potential consultations and forms of control, etc.;

– Storing of information, entering memory of a central computer within an indefinitely long time, and prepared to be conveyed by a student's request;

– Preparation and editing of text information;

– Rewriting of various types of Internet information to hard disc or other data storage media (and back);

– Printout of texts for using in teaching and educational process.

Demonstration of on-screen texts and graphics enables to organize students' participation in groups in discussing and interpreting information. It is didactic properties that enable information and communication technologies to fulfil didactic functions aimed at implementing teaching and educational process and its features (possibilities to explain, clarify, discuss, making check analyses, tests, creative operations, etc.), teacher's communication with students, creation of favourable conditions for effective learning and cognitive activity. It is multimedia-technologies that enabled to pass a part of a teacher's functions, fulfilled in the course of the learning process, to a computer programme, and a computer, respectively. Thus, a computer evolved from the ancillary device to the major didactic tool enabling to work with interactive information. E-learning resources may help to efficiently organize any type of lesson and individual work of students. Use of multimedia technologies ensures that the studied material is most notably illustrative due to presenting information in the form of 3D graphics, photographs, schemes, accompanying audio, video-segments, animation. Such form of giving lessons enables to identify whether the students are adequately trained. It is information and communication technologies that allowed competently assessing the results of learning.

According to the terminology of a quality management system, effectiveness is a ratio of the results obtained and resources used, and efficiency is a degree to which certain results are achieved (Aleshugina, 2007). If the assessment is considered as a process for determining a degree to which the students learning outcomes correspond to the planned results of curriculum, a degree of the student's achieving planned learning outcomes expressed in grade points may be seen as a result of the assessment. The definition does not reveal the effectiveness of the assessment result for controlling the learning process and is not indicative of its functions in the system. Therefore, a degree to which assessment functions are fulfilled in the system of controlling the learning process will constitute an efficiency of assessment. To assess competencies both management, and motivational and formative functions of assessments are important (Vaganova, 2011). Further, we consider ICT potential for performing these functions.

It is impossible to assess competency learning outcomes without using ICT and standardization of procedures, and it is challenging to match the points of forming thereof and control within the structure of the basic professional educational program (BPEP). Competencies will be assessed and developed at the various stages of BPEP within different disciplines and modules. Several competencies are formed and assessed for each specific discipline, and a control measure is actually one; however, its results need to be interpreted in terms of discipline, competence, and labour activity (Vaganova et al., 2016).

After implementing control measures, teachers need to detail the results of the assessment in evaluation sheets. In the existing conditions of assessing students' activity, teachers are prompted to transform results into grade points (Zulkharnaeva et al., 2017). Information technologies enable to simplify the process by decreasing student's and teacher's classroom hours through the creation of a standardized form of documents to process statistical data (Kutepova, 2016). In terms of management functions of assessment, use of ICT facilitates:

- Organizing constant daily management of the learning process according to the assessment results;

- Automatization of assessment procedures, elaboration of assessment means, prompt processing of statistical data according to assessment results;

- Asynchronous and distance carrying out control measures;

- Organizing independent evaluation involving teachers of other overseas higher education institutions;

- Prompt submission of clear and accessible data;

- Reducing subjectivity in assessments;

- Reducing labour efforts to conduct assessment procedures and process their results;

- Delivery of necessary properly detailed information to all the persons concerned about student educational achievements,

- Organization of assessment of the results in terms of discipline, competence, and labour activity (Gushchin, 2015).

Teachers are to motivate their students; something that is of great importance in teaching (Ilaltdinova et al., 2017). However, with ICT introduced, this process is organized almost on its own due to transparent nature of procedures and accessibility of organizational and methodological materials on control measures and assessment results, clear results of student educational achievements, and owing to opportunity for doing homework distant from a higher education institution (Fedorov et al., 2017). Use of ICT has to offer many advantages in the form of individualization of the learning process that is currently of high value in professional education and developing formative assessment and self-esteem (Nemova et al., 2016). A whole new level of student activity is found with ICT utilized within a competency-based approach due to such interactive educational and evaluation tools as forums, cases, web-quests used in the process of teaching (Kaznacheeva et al., 2017). All this ensure creative interaction among students in the process of internalizing information, creating a new product, and its promotion. Use of video (video-cases,

webinars, and segments of movies with typical situations to be analysed by students) and online tests with developing component facilitate new possibilities in assessment procedures (Yashin et al., 2017). Internet-services allow organizing formative assessment using virtual space for students' team-work. This activity enables to develop information and communication competencies of students. In the process of evaluating learning outcomes, ICT are utilized as assessment instruments to:

– Design assessment tools;

– Implement assessment procedures;

– Organize learning process (Yashkova, et al., 2016);

– Serving as the elements of information and educational environment of a higher education institution;

– Efficiency of the above scheme of activities depends on procurement of education institution.

ICT advantages in the process of education are as follows:

- Development of information competence and culture of presenting and using information (capability of acquiring

information individually and sort out the main subjects for itself);

- Enhancement of learning motivation towards disciplines under study;

- Stimulation of cognitive activity;

- Effective use of time and resources for studying;

- The potential use of various teaching methods that increase learning efficiency of students;

- Increased scope and enhanced quality of student individual work since students need to work more on an individual basis in conditions of a competency-based approach;

- Enhancement of overall education quality due to possible more structured and strict control of students' results (Smirnova et al., 2016).

Though the technologies in question have many advantages, the drawbacks of their use are also worth mentioning:

- Less role of emotional communication;

- Lack of connection with the primary sources of information;

- Less motivation towards acquiring skills of communication and team-work in real conditions (Vaganova et al., 2016).

It should also be noted that it is a teacher's responsibility to have knowledge and competencies needed in this area.

3. RESULTS

ICT as a tool for learning and controlling may be wholly applied only when creating higher education institution information and education environment, which fully satisfies information requests of education institution entities, with appropriate models of learning applied. ICT enables students to show better results of their learning activity in a higher education institution.

4. CONCLUSION

ICT opens up plenty of opportunities that make it possible to oversee a process of developing competencies and readiness of students for performing professional activities pursuant to the results of monitoring and fulfill currently existing requirements for assessment procedures. There is free and open access to the data on

developing competencies of students, i.e. information about students' readiness for professional activity is opened to all concerned.

The results of the assessment provide new insights and information content. ICT facilitate:

- Presentation of the results of studying a specific discipline or module, a degree of mastering a particular competence, or readiness for performing professional or labour activity;

- Demonstration of a position of the specific result (discipline or module) in the structure of the basic professional educational program;

- A detailed presentation of assessment results to the level of a module and a discipline, or sometimes, a subject and a lesson.

Furthermore, use of ICT in the system of assessing learning outcomes brings extra advantages when fulfilling motivational, formative, and management functions. This, in turn, enhances efficiency and effectiveness of learning. Information and communication means in educational institutions will be developed with government support and incentives.

5. COMPLIANCE WITH ETHICAL STANDARDS

Conflict of interest: The authors declare that they have no conflict of interest. Ethical approval: This article does not contain any studies with human participants performed by any of the authors.

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