



Development of University's Market of Educational Services in the Age of the Digital Economy

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Abstract

The purpose of the article is to study various factors affecting the market of educational services in Russia, as well as to study the development trends of European education, which our country has joined, having joined the Bologna process. The authors do not ignore the influence of the domestic labor market on the educational services market. The article also explored such a factor as the level of professional training of students, in particular, according to the bachelor's degree profiles. The article discusses the application of modern methodology of the educational process in higher education in the digital economy. First of all, a conclusion is made about the ambiguity of the concept of the digital economy, and the author's understanding of this term is given on the basis of scientific works of various authors and regulatory locales. The specificity of e-education implies the use of online technologies and distance learning in the university, as well as the corresponding software of the educational process. The author's vision of the e-learning methodology in a higher educational institution is proposed, which consists of three main elements—system forming, technical, and control. It should be viewed in inseparable connection with the appropriate methodological support of the learning process in a higher educational institution. Special attention is paid to gaming technologies and external digital platforms such as Moodle and Google. This methodology is considered in the context of the use of a methodological competence-based approach to the study of accounting disciplines.

Keywords

Digital economy • Higher education • Distance learning • E-learning • Competence approach • Financial accounting

JEL Codes

A20 • A22 • M41

1 Introduction

The market of education services provided by higher education institutions has suffered sizeable fluctuation in recent decades in Russia. This is due to a number of reasons.

First, a transition of Russian academic educators to the Bologna process, similar to foreign colleagues in the European Higher Education Area, was announced, which implies extensive use of the exchange of the teaching staff in higher education as part of international academic mobility, as well as the use of a single system of credits (points of credit) and a competence approach to the study of the disciplines of the curriculum in the educational process. This transition has caused significant changes in the approaches of Russian higher education institutions both to the management of applicants and the management of the educational process in higher education institutions through the use of new technologies in education. Due to the fact that there has been a slight decline in the level of vocational training of both applicants and students of higher education institutions for many years now, Russia's transition to a new educational track has proved to be a very difficult task for the whole state.

At the same time, along with the new economic system of the country (the market economy has been replaced by the innovative economy and further by the digital economy), as well as with production needs in the context of the

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unfavorable epidemiological situation in the world, there is a growing need of the state for new management personnel and related breakthrough projects in all spheres of business activity which will be readily supported by the state and major budget revenue generating enterprises. There is a need to change educational technologies in the age of the so-called digital economy, and there is no unambiguous definition for it due to the absence of the definition of the concept of the digital economy as such as the main category of any branch of science disciplines, fully agreeing with the authors of the research (Dneprov & Mikhailuk, 2019).

Thus, apart from the influence of price policy of higher education institutions on the education market and the difficulties in the formation of the national labor market (let alone the weakness of regional labor markets) in conjunction with the indicators of employment of graduates of a higher education institution, it is educational technologies that come to the fore methods and tools of the educational process that is used in a higher education institution. This has a positive impact on the situation in the modern education market in Russia, stepping up competition between higher education institutions that compete for the high quality of professional education of students of bachelor's and master's programs. Particularly noteworthy is the bachelors' program, as it is widely stated among employers being budget revenue generating enterprises that the annual need for renewal of personnel with master's degrees, requiring prospective employees to have unconventional thinking and certain research competences, is significantly lower than the need of enterprises for bachelors capable of performing executive functions.

Hence, we shall pass on to the discussion of modern educational technologies of a higher education institution in the age of the digital economy. Based on the research of Savina, (2018), this term is used in many branches of human knowledge in the context of capabilities of using digital technologies for the processing of BigData to improve economic efficiency of a particular kind of activity. This is also confirmed by the following authors (Galkevich et al., 2018).

According to Government of the Russian Federation, (2014) and (Government of the Russian Federation, 2017), it is expected that Artificial Intelligence will be introduced for the solution of many government tasks in the future.

2 Methodology

The authors explored the changes in the selection of the tools for the implementation of higher education programs in Russia that are necessary for the high-quality implementation

of education services with the dominance in all sectors of the digital economy and digital education platforms.

Based on the research of Vanchukhina et al., (2018), as well as the paper of Vanchukhina et al., 2019a, especially in the context of technical and technological higher education institutions, the following authors' classification of methods and tools for using the e-learning methodology in a higher education institution in the age of the digital economy can be put forward.

1. Systemically important element—online learning methodology—includes the distance learning systems of a particular higher education institution, as well as external systems (Moodle, Google Classes with Google Tables, education platforms that stem from library platforms, online-testing systems, etc.), webinars, online masterclasses, etc.
2. Technical element—technical methods and tools that correspond to appropriate software, disciplines are game technologies, including networking technology (Business course “Corporation,” etc.), computational and analytical software (STATISTICA, 1S-Enterprise, etc.), corporate ERP systems, and automated workstation management systems (SAP, etc.)
3. Control (infrastructural) element—“personal accounts” of learners and teachers to reflect current learning parameters (modules: learner's portfolio, session, electronic timetable, etc.)

In this regard, the term “digital pedagogy” is becoming increasingly relevant. As can be seen from the classification, the selection of appropriate parameters of the e-learning methodology is determined by the higher education institution and has an influence on the education market to a certain extent. Students especially like game educational forms that are based on various cases.

The authors' idea is also confirmed in the research paper of Vanchukhina et al., 2019b, as well as in the research of Leybert and Vanchukhina, (2013).

According to the authors, the application of this classification will be very efficient in conjunction with the use of the methodological competence approach to the assessment of the level of development of competences by students during the study of disciplines (through the example of the Financial Accounting discipline) that was also suggested by them. It is presented below.

The competence approach is the methodological basis for the implementation of Federal States Education Standards. The development of a high-level professional competence is due to the need to adapt education to the increasing demands of the labor market.

The level of knowledge, skills, and competences gained in a higher education institution by a student can be reliably determined only in the course of professional life of a graduate. Therefore, in order to implement the competence approach, it is necessary to figure out how to assess the level of development of competences by students during their study in a higher education institution. Therefore, the primary objective of the competence approach is to make competences part of the content of the working programs in the disciplines of the curriculum in advance. In addition, control activities stipulated in the working programs to assess the proficiency in a particular discipline must correspond to the level of development of competences achieved by students. Such approach will make it possible to assess the contribution of each particular discipline provided for in the curriculum in the level of development of certain competences, and will also allow assessing the level of development of competences by students throughout the period of studies, in other words, assessing the quality of education.

Financial accounting discipline is a discipline of the variative part of the bachelors' curriculum "Accounting, Analysis, and Audit" of major 38.03.01 "Economics" of Ufa State Petroleum Technological University. In accordance with the curriculum, the discipline is studied during the fifth and sixth semesters. The following professional competences are formed as a result of the study of this discipline:

Professional competence 1 (PC-1)—the ability to document business transactions for all accounting items and to formalize payment and account documents;

professional competence 2 (PC-2)—the ability to make accounting entries based on the working schedule for accounting of assets, liabilities, operating profit, results of assets and liabilities recognition, and sources of financing;

Professional competence 3 (PC-3)—the ability to generate accounting (financial) and statistical reporting, to prepare income tax returns;

Professional competence 4 (PC-4)—the ability to apply knowledge of Russian and International Accounting Standards and Financial Reporting Standards in professional activity.

Financial accounting discipline is involved in the formation of general cultural (GCC), general professional (GPC), and professional competences (PC). Financial accounting discipline is the first discipline in the curriculum for the development of certain competences (e.g., PC-3), while it is the second discipline for other competences (e.g., PC-1, PC-2, PC-4).

As can be seen from the above, competences are gradually formed in the process of the study of the disciplines of the curriculum. Table 1 shows the process of the formation of professional competences that were assigned to the financial accounting discipline, in the disciplines of the

bachelors' curriculum "Accounting, Analysis, and Audit" of major 38.03.01 "Economics" of Ufa State Petroleum Technological University.

The matrix of assignment of competences to disciplines is made before the formation of the curriculum. Professional competences have provided an example of how the formation of each competence is not restricted to a single discipline, but occurs with the process of study of different disciplines in different semesters.

The education result is generated in the working program of a discipline in the form of indicators of development of general cultural, general professional, and professional competences. Thus, according to the working program of the financial accounting discipline, the result of its acquisition is presented in the form of knowledge, skills, and possession of those professional competences that are provided for a particular discipline, namely:

– **to know, to understand, to possess:**

- the ability to document business transactions for all accounting items and to formalize payment and account documents (PC-1),
- the ability to make accounting entries based on the working schedule for accounting of assets, liabilities, operating profit, results of assets and liabilities recognition, and sources of financing (PC-2);
- the ability to generate accounting (financial) and statistical reporting, to prepare income tax returns (PC-3);
- the ability to apply knowledge of Russian and International Accounting Standards and Financial Reporting Standards in professional activity (PC-4).

The tools for appraising expertise, knowledge, and skills are equally important in assessing the proficiency in a particular discipline by students. The control activities for such appraisal are presented below:

- for the assessment of expertise in a discipline—testing and examination;
- for the assessment of knowledge—test;
- for the assessment of skills gained—course work and laboratory work.

It should be noted that all control activities are aimed at identifying the level of competence that has been formed in the course of learning of this discipline, which makes it possible to eventually assess the level of development of certain competences.

The point-rating system was introduced in Ufa State Petroleum Technological University to assess the proficiency in a particular discipline. All control activities stipulated in the working program throughout the semester are appraised by points, the maximum number of which is 100. Then, total rating points are converted to the current grading system.

Table 1 Matrix of the formation of professional competences by curriculum disciplines

Names of disciplines that are involved in the formation of professional competences by curriculum semesters	Competence index			
	PC-1	PC-2	PC-3	PC-4
<i>4th semester</i>				
Accounting and analysis	+(1)	+(1)		
Main accounting and analysis models in foreign countries				+(1)
<i>5th semester</i>				
Specifics of taxation of enterprises of the oil and gas industry				+(1)
<i>6th semester</i>				
Financial accounting	+(2)	+(2)	+(1)	+(2)
Laboratory practicum on accounting	+(2)	+(2)		+(2)
Accounting & financial reporting				+(2)
<i>7th semester</i>				
Tax accounting management			+(2)	
Management accounting				+(3)
International financial reporting standards				+(3)
Integrated reporting				+(3)
<i>8th semester</i>				
Situational practicum on taxation of enterprises of the oil and gas industry			+(3)	+(4)
Tax audit				+(4)
Accountancy	+(3)			
Audit				+(4)
Complex course work				+(4)
Pre-graduation internship	+(3)	+(3)	+(3)	+(4)

Source compiled by the authors

The points are awarded for the completion of the following control activities:

- examination (a maximum of 20 points can be awarded for it);
- test (a maximum of 5 points can be awarded for the correctly completed test);
- test works (for a correctly completed test work consisting of 15–20 tests on the subjects of the discipline, a maximum of 2.5 points can be awarded);
- work at practical classes (a maximum of 2 points can be awarded for the active involvement in the solution of cases offered).

The record of attendance of lectures and practical classes is assessed as well (a maximum of 20 points can be awarded for zero absences without valid excuse).

The number of rating points collected is converted to the current 5-point grading system.

The final semester grade appraising student's knowledge in a particular discipline is calculated using all points that were awarded for the completion of all control activities stipulated in the working program.

The types of works listed above can be awarded by points as follows (Table 2).

In the end of semester, total rating points are converted to the current grading system; in this respect, the following point scale for assessing the proficiency in a particular discipline was set:

- “excellent”—if 80–100 points have been collected;
- “good”—70–79 points;
- “adequate”—50–69 points;
- “poor”—less than 50 points.

Point scoring by the type of control activities is carried out by the teacher in the register.

The examination is appraised in points in the same way:

The final grade can be given without an examination if the corresponding number of points was collected for the completion of control activities throughout the semester and provided that all test works and tests are completed.

Such system allows carrying out continuous monitoring of students' performance and disregarding any accidental occurrences when the examination is passed in a particular discipline.

Table 2 Point scoring by the type of control activities and works

Type of control activities and works	Attendance record	Participation in practical classes	Testing	Test
Maximum number of points for a point of credit	Minus 1 point for every two absences	1–2 points (per class)	2.5 points (for every correctly completed test work)	5 points (for a correctly completed work)
Maximum number of points by the type of work	20	25	15	20

Source complied by the authors

The value of the level of development of each particular competence will cumulatively change in the course of the study of other disciplines during subsequent semesters and acquisition of new expertise, knowledge, and skills. Such methodological approach to the assessment of the level of development of competences does not depend on the content of competences as such, and, in our opinion, is almost universal.

3 Results

The authors have developed their own classification of e-learning methods and tools in the age of the digital economy. Sometimes it justifies involving students in the in-depth study of disciplines within the scope of additional educational program (which is in common practice in technical specializations with qualification awarded for the so-called professional occupations), or involving students in the fulfilment of research agreements of the department.

It is the so-called e-learning system that requires accurate selection of teaching aids for the same specializations of the bachelor's program for which there are occupational standards, for example, in accounting specializations. This should be implemented in conjunction with the methodological approach to the assessment of the level of development of competences in the corresponding disciplines of the curriculum which is relatively new to Russia.

The competence approach to assessment of the level of development of competences in a higher education institution (through the example of an accounting discipline) suggested by the authors consists in the formation of the matrix of assignment of relevant competences to education courses and point scoring within the framework of the system of credits (points of credit), and makes it possible to provide reliable rationalization for the most efficient educational form and select the best software, including applied software packages to be installed later.

Both pilot projects of the authors have been tried and tested, and have been applied in the education programs for bachelors in Ufa State Petroleum Technological University.

4 Conclusions

1. With a view to developing education markets in Russia, the need to combine conventional and new learning tools implementing higher education programs in higher education institutions in the age of the digital economy has been proved.

Thus, new tools of educational program should include the distance learning method that in turn must be implemented through the use of appropriate software. In an environment where the Internet is almost universally accessible to learners, it becomes reasonable to use multi-variate education programs that can use software for Big-Data, etc., as well as external digital platforms, especially those with embedded kits for creation of test material, and (other online technologies, e.g., Google Classes), to such students.

Therefore, the suggested authors' classification of e-learning methods and tools in a higher education institution in the age of the digital economy is based on the reasonable selection of software utilities that allow to ensure high-quality education in higher education institutions.

2. Along with the alteration of the methodology of education in higher education institutions in the age of the digital economy, it is also necessary to implement the competence approach to the formation of curriculums in the main educational program for bachelors in order "not to lose" the ability to use the competences that have already been developed by students (digital-skills) that were only acquired through the use of good software in the educational process in the middle of studies.

Thus, the suggested methodological approach to the assessment of the level of development of competences (through the example of the study of the Financial Accounting discipline in Ufa State Petroleum Technological University) in the age of the digital economy cannot be implemented without such tools as distance learning, and for

a number of specializations of the Bachelor's program—additional educational program. Further, it should be noted that these tools should be preserved from year to year throughout the entire period of studies to maintain permanent quality of education, which will make it possible to monitor the dynamic pattern of development of necessary competences by students studying this discipline.

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