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The impact of digital technologies on the effectiveness of learning material by students in the educational process

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***Abstract* — The sphere of education in the era of the digital economy is undergoing tremendous changes. The methods and tools for presenting information, the infrastructure of educational institutions, the content of the educational programs and the level of their practical orientation are in need of improvement. In the present paper an attempt is made to assess the level of students' satisfaction with the technological competences of lecturers at the university. The authors put forward a hypothesis about the existence of a close relationship between the level of learning educational materials and the degree to which teachers use digital (information and communication) technologies in the educational process. It is proposed to consider as a digital technology the use of computer equipment and the Internet, the use of online training platforms and online resources as part of the educational process, demonstrations of presentations, videos, personal accounts and other applications to establish and maintain contacts with students. The result of the correlation and regression analysis was the conclusion that the increase in the use of digital technologies in the educational process by 1% leads to an acceleration of the rate of learning material by students by 1.68%.**

Keywords — digital technology, educational process, quality of education, technology competency, university.

I. INTRODUCTION

The development of the educational system occurs simultaneously with the processes of globalization and digitalization of the economy. In the modern world, where knowledge is becoming obsolete in a fraction of a second, attention is being paid to the quality of acquired competencies as a result of training in educational programs. An important role in the learning process is played by the lecturer as a source of information transfer [7]. The level and degree of development of the students' formed knowledge depends on the level of competence of the lecturer, his ability to captivate by teaching discipline, to make the material accessible to understand. However, in the era of digitalization of society, the lecturer is forced to use new tools for teaching students. For example, these include: interactive ways of contacting with students, gamification of the learning process, demonstration of video, audio and presentations in class, the use of Internet technologies to search for information and organize video conferences, the use of specialized software in the educational process [4;5;6].

In this regard, the question of the need to use these technologies in the educational process, determining the likelihood of increasing the level of mastering the material by students and evaluating the positive and negative effects depending on the adaptation of new technologies in the educational process is important.

The aim of the research is the development of theoretical approaches and methodological tools for assessing the impact of using digital technologies on the quality and pace of assimilation of knowledge and skills. To achieve the goal the following research objectives were set: - to develop a questionnaire to assess the level of students' satisfaction with the use of digital technologies by lecturers in the educational process; - to conduct a comparative analysis of the results of studying the course of disciplines with the use and without the use of information and communication technologies; to form conclusions about the expediency of using digital technologies in the educational process.

The object of research in this case is the digital technologies and their impact on the quality of educational activities. The subject of the research is the level of mastery of educational material in the educational process taking into account the active use of digital technologies. The scientific novelty of this study is to identify the degree of influence of the use of digital technologies on the effectiveness of the educational process. The results of this study are aimed at

improving the efficiency of the educational process by implementing new approaches in learning activities using digital tools.

II. METHODS

In order to take into account the views of students as the main participants of the educational system, the university decided to develop methodological tools to assess the level of students' satisfaction with lecturers.

The feature of the adopted guidelines for the survey was based on the principle of comprehensive assessment of the competences of lecturers. The questionnaire was developed consisting of three blocks to assess the professional, technological and personal competencies of the lecturers. Evaluation criteria for lecturers were based on a student survey questionnaire used in determining the ranking of the best universities in the world (QS World University Rankings) [9;10].

As part of this study we will examine in more detail the technological block, which included digital indicators. Indicators of the technological block are responsible for the ability of the lecturers to work with students through the use of electronic devices.

Technological block consists of the following indicators:

1. The lecturer's use of multimedia tools (presentations, computer simulations) or useful handouts and additional materials (papers, cases, etc.);
2. The use of a personal account for the publication of electronic educational resources, software for further use in the learning process by students (working with software);
3. The use of training platforms, online materials in the learning process and during the formative and summative assessment.

Using Google forms an online questionnaire was created and a survey of university students was conducted. Further, the results and data from Google Forms were downloaded and processed in Excel, and a correlation analysis was performed using SPSS Statistics 23.

The calculation of the final score is as follows. Each of the three indicators is rated on a five-point scale - from 1 to 5 points, where 1 is very bad, 2 is rather bad than good, 3 - sometimes good, sometimes bad, 4 - rather good, than bad, 5 - excellent.

For each lecturer all points from all students for each indicator were summed up. After that all the points for each indicator are added up and are divided by the total number of students who made evaluation the teacher on this indicator according to the arithmetic average formula where “a” is the score assigned to the teacher by the student; "n" is the number of students who made evaluation the teacher on this indicator:

$$\bar{a} = \frac{a_1 + a_2 + a_n}{n} \quad (1)$$

Further, the arithmetic average is calculated: the average of 3 indicators are summed up and divided by 3.

Further, to identify the relationship between student performance and the use of digital technologies by lecturers during the learning process, a multifactorial correlation-regression model was built, consisting of the following variables: Y is the level of student achievement; X1 - the use of multimedia in the educational process; X2 - the use of software in the educational process; X3 - the use of gaming learning platforms, online tests for students and etc.

III. RESULTS

The survey was conducted on bachelor and master full-time and part-time programs. 765 students of bachelor and master program took part in the survey. 222 lecturers were evaluated as part of the analysis of the “Technological block”.

In general out of 222 lecturers: 2 teachers (0.9%) received an average grade of 5 points, 142 lecturers (63.9%) received 4 points, 69 lecturers (31.1%) received 3 points, and 9 lecturers (4.1%) - 2 points. Thus, the majority of lecturers successfully use digital technologies in the educational process.

Following the comparison of two similar groups of students, satisfied and dissatisfied with the use of digital technologies, the hypothesis was confirmed that there is a positive relationship between student performance and the use of digital technologies by lecturers during the learning process. The active and thoughtful use of these technologies in the educational process allows to increase students' interest in learning new material. As a result the speed of mastering information increases, long-term consolidation of knowledge is ensured. There is also the fact that the use of modern digital technologies increases the students' attendance of classes [8].

The analysis revealed that the questioning of students is an important part of the mechanism of independent assessment of the quality of education in the university [3].

Assessment of student satisfaction with the work of lecturers should be used as a tool to improve the efficiency of the university [1]. So, this tool can be used in the following areas: rating of university lecturers; the formation of advanced training programs for scientific and pedagogical personnel based on the results of the survey; identification of scientific and pedagogical personnel potential of the organization on the basis of surveys; the formation of clear criteria for competitive selection of teaching staff, etc.

IV. DISCUSSION

The analysis found out that, in general, students are satisfied with the quality of teaching work.

To identify the relationship between student performance and the use of digital technologies by lecturers during the learning process, a correlation and regression analysis was performed using SPSS Statistics 23. The following results were revealed when testing the hypothesis: the correlation coefficient is equal to 0.54, it is significant at the level of 0.01, so with a probability of 99%, that's why we can argue the presence of a significant direct relationship between the use of digital technologies in the educational process and student performance. It should be noted that the greatest degree of correlation, namely, 0.628 was observed among students on the bachelor programs such as "Marketing" and "Advertising". Thus, the hypothesis was fully verified.

Correlation-regression analysis of the relationship of student performance indicators and the activity of using digital technologies in the educational process (demonstration of presentations, video, use of gaming platforms, software) revealed a rather high closeness of the relationship of the

dependent variable Y with three explanatory factors included in the model (X1, X2, X3).

The positive qualitative and quantitative relationship was found between the indicator of the level of learning and the frequency of using digital tools and digital teaching methods as a result of the study based on the obtained regression statistics and variance analysis. So, the most significant influence on the variable Y is exerted by the factor X2, the smallest - by the factor X1.

It can be assumed that the identified relationship is observed as a result of the following actions: the use of software as well as training platforms (for example, Kahoot) contributes to the visibility and practice-oriented character of the discipline. As a result, it simplifies the learning and memorization of material by students. According to the calculations the increase in the use of digital technologies in the educational process by 1% leads to an acceleration of mastering the material by students by 1.68%.

Thus, according to the results of monitoring, individual recommendations to the lecturers on the improvement of teaching methods and tools in the digital economy can be formed.

V. CONCLUSION

To sum up, the questionnaire "Assessment of students' satisfaction with the quality of teaching work" was developed taking into account international requirements for assessing the quality of education (including Quacquarelli Symonds requirements). As part of the survey proposals for improving the quality of education at the university were prepared.

In order to further increase student satisfaction with the quality of educational activities in the digital economy era authors recommend the next:

1. To obligate faculties to make a questionnaire on the assessment of the use of digital technologies by lecturers in each learning module (with the issuance of the relevant order of the University);
2. To indicate the software that is necessary for use in the educational process in the academic course working programs;
3. To conduct professional development of lecturers in the use of digital technologies in order to improve the efficiency of the educational process.

According to this it should be noted that this study is extremely relevant and important from the point of view of quality assurance of educational activities. The student, being the main participant in the educational process and the "customer" of educational programs, is at the same time the object, the one to whom the educational activity of the university is directed [2]. Student satisfaction growth will lead to an gain in the number of applicants, an increase in the popularity of educational programs and a university's competitiveness on the Russian and international educational markets.

References

[1] A. Varlamova, Comparative analysis of approaches to assessing the quality of higher education in Russia and abroad. Bulletin of the North-Eastern Federal University, № 2 (volume 6), 2009, pp. 59-64.

[2] D. Kember, Doris Y. P. Leung, K. P. Kwan. Does the use of student feedback questionnaires improve the overall quality of teaching? Journal Assessment & Evaluation in Higher Education, Volume 27, Issue 5, 2002,https://www.tandfonline.com/doi/abs/10.1080/0260293022000009294?src=recsys.

[3] E. Shubenkova, A. Bobkov, Realization of a new educational model of a bachelor degree: the experience of Plekhanov Russian University of Economics. Herald of Plekhanov Russian University of Economics, № 3 (87), 2016, pp. 27–36.

[4] E. Shubenkova, S. Badmaeva, N. Gagiev, E. Pirozhenko, Adult education and lifelong learning as the basis of social and employment path of the modern man. Espacios, T.38, № 25, 2017, pp. 25-30.

[5] G. Til, Theoretical foundations of the formation of a system of continuous professional education. Bulletin of the Academy, № 2, 2009, pp. 75-76.

[6] M. German, Continuing education: the evolution of development, objective, reality. Tomsk State University Bulletin, № 2 (18), 2012, pp. 147 - 154.

[7] M. Shevlin, P. Banyard, M. Davies, M. Griffiths, The validity of student evaluation of teaching in higher education: love me, love my lectures?, Journal Assessment & Evaluation in Higher Education, Volume 25, Issue 4, 2000, https: //srhe.tandfonline.com/doi/abs/10.1080/713611436#.XAZ3UFQzbcs.

[8] O. Alkhimenko, A. Asaliev, O. Kuksova, Human Capital on the Knowledge Economy: The Role of Continuing Education. Review of European Studies, Vol. 6. (№ 4), 2014, pp. 277-282.

[9] QS World University Rankings. http://www.topuniversities.com/university-rankings.

[10] The World University Rankings. https://www.timeshighereducation.com/world-university-rankings.