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DIGITAL RESOURCES AS A WAY TO INCREASE THE MOTIVATION OF ECONOMIC SPECIALTIES STUDENTS IN STUDIES OF MATHEMATICS

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ABSTRACT

*The **purpose** of the work is to analyze the technical, methodical and psychological aspects of digitalization in education and, in particular, the methods of ensuring the effectiveness of independent work of students in the conditions of e-learning. The main attention is paid to the problem of the*

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influence of interactive educational technologies on the formation of external and internal motivation of students of economic specialties to study mathematical disciplines.

Methodology. *In the conditions of e-learning continuous monitoring of the success of students in mastering mathematical methods and their application to solve economic problems was carried out. The success of each student in performing each type of work separately, as well as his overall rating among other students in the group, were determined. These results were supplemented by the results of the students' questionnaire regarding their own attitude towards interactive technologies as a tool aimed at forming motivation for learning.*

Results. *The virtual environment for e-learning was built using Moodle LMS and contained learning digital resources of various levels of interactivity, including electronic multimedia publications. This helped to fully meet the needs of the distance educational process. To form the student's external motivation, the authors used an electronic journal in which the types of current tasks, points for their completion, the student's rating for each type of tasks, as well as for all types of tasks in general, are defined. To support internal motivation, interactive learning elements were developed and implemented. The effectiveness of the use of digital resources was confirmed during the monitoring of students' success and by the results of the survey of the participants of the experiment.*

Conclusions. *A significant advantage of the use of interactive components in the educational process should be considered the creation of conditions for a better understanding of theoretical material and using mathematical apparatus for solving real economic problems. The use of multi-level digital resources gives the student the opportunity to build an individual educational environment that increases internal motivation to study.*

KEYWORDS: *Digital Resources, Electronic Multimedia Publication, Remote Learning, Individual Educational Environment, External and Internal Motivation.*

INTRODUCTION

In modern conditions of the formation of the knowledge economy, the country's competitiveness depends on its competitiveness in the field of science and education. In Ukraine, higher education has a mass character. Among the population aged 23 and over, 82.7% have a higher education, and according to the Tertiary Enrollment component of the Global Innovation Index, Ukraine ranked 14th among 131 countries in 2020 (Global Innovation Index 2020, 2020).

At the same time, according to the Knowledge Impact component, it took only 45th place in the rating, and according to the Creative Goods and Services component, it took only 95th place. This means that there is a gap between the quantitative indicator of education and indicators that reflect the impact of education on the development of the economy. And this is related to the quality of education. Thus, according to the 2018 QS Higher Education System Strengths Rating (QS Higher Education System, 2018), Ukraine ranked 44th in

terms of quality of education among 50 countries. All this indicates that the quality of higher education in Ukraine does not meet the expectations of employers, students, or society as a whole.

In order for graduates of higher education institutions to be competitive on the labor market, they need not only to have modern theoretical knowledge and practical skills, but also to be able to solve complex tasks, create innovative intellectual products, and also learn to learn, that is, to be internally motivated to learn. Therefore, one of the basic directions of education reform in Ukraine (Reforma osvity, 2020) is to ensure high-quality higher education and expand opportunities for adult education. In these conditions, the education system must develop and improve in order to be able to fulfill its mission, namely to provide a person with the opportunity to realize himself in the future.

And one of the leading trends in the development of higher education, the implementation of which can solve this problem, is considered digitalization of education. It is thanks to digitalization that it is possible to ensure the access of a wide range of applicants to quality education not only at the national, but also at the world level. Therefore, when building the latest educational programs, the acquisition of universal competencies is considered the most relevant: the ability to learn, process information, quickly master new progressive technologies, the ability to think critically and approach tasks creatively (Strategy for the Development of Higher Education, 2020, p. 30).

And the transition of educational technologies to a digital format is able to ensure the accumulation of such competencies. However, there is a significant gap between the opportunities offered by modern digital technologies

and those information and communication technologies that are used in the educational process, if such use takes place in general. Therefore, there is a need to fully realize the advantages provided by modern digital technologies for the educational process improvement and the use of interactive learning methods to increase its effectiveness.

At the level of higher education, digitalization involves admittance to respective technologies for both students and teachers, as well as for the administration of the educational institution, the availability of digital multimedia content, as well as the ability and skills of students and teachers to use digital learning resources (Project: Digital Agenda of Ukraine, 2020 25). Digital learning resources are any educational information provided in digital format.

At the same time, preference is given to open resources for that any digital devices (from a computer to a mobile phone) are suitable. It should also be emphasized that one of the features of the present time is the rapid change of educational content, therefore, it requires regular updating, and this is easier to do if it is provided in digital format.

Therefore, digitalization is considered as one of the leading factors in building an innovative university. It is the creation of the industry of innovative digital technologies that makes it possible to achieve the strategic goal of education reform in Ukraine, namely, to ensure the availability of high-quality higher education for various segments of the population.

Taking into account the aging of the population, on the one hand, and the accelerated development and implementation of the latest technologies in various fields, on the other hand, the use

of digital technologies creates conditions for any person to renew his professional qualities throughout his life, which is provided for by the UNESCO "Lifelong Learning" program.

Social, theoretical and technical aspects of the application of information technologies in education began to attract the attention of scientists and practitioners at the end of the 20th century. However, these questions became especially acute in connection with the spread of COVID-19, when the educational process in educational institutions of all levels began to be carried out in a distance form (Jackson, 2021).

What urgent measures should be implemented to accelerate the digitization of education in Ukraine? First of all, attention is paid to the software of the educational process at the "student" and "teacher" levels (Bykov, Spirin, & Pinchuk, 2020; Morze, at al., 2021; Modlo, at al., 2020; Shakhina, 2017, etc.).

There are also examples of the implementation of information systems supporting the educational activities of universities simultaneously at three levels: "student", "teacher", "administration" (Kukharenko, & Bondarenko, 2020; Trius, at al., 2021). In fact, we are talking about the creation of a virtual university as a digital reflection of the corresponding institution of higher education.

However, the development of software is only one aspect of the problem. Another, but no less important, is the structure and content of digital learning resources. The teacher must not only ensure the high-quality content of these resources, but also rationally build them to realize their full potential. And not all teachers have the necessary skills for this (Börnert-Ringleb, Casale, & Hillenbrand, 2021).

There are many types of digital learning resources, among which the electronic textbook as a structured multimedia publication occupies the highest level. Such an electronic educational and methodological complex is able to ensure user interactivity thanks to the creation of an educational SMART environment (Nahaev, & Hrynova, 2020).

The main advantage of multimedia electronic textbooks is that they are able to provide an interactive dialogue between the user and the software system, while there is an opportunity to choose options for the level of educational content, mode and place of work, that is, the student has the opportunity to create his own educational space (Gurevich, Kademiya, & Shevchenko, 2012, p.71).

This means that the user has the opportunity to customize and optimize the organization of the learning process itself. These properties of digital resources are important not only for ensuring the quality of education, but also for the formation of students' internal motivation to study. For example, the use of digital resources increases student engagement in face-to-face learning (Ullah, & Anwar, 2020).

When introducing learning digital resources in the conditions of distance learning, there is a need to create effective factors that motivate the user to study, and this puts forward additional requirements for the content of the digital resource and its structure. That is why most studies devoted to the structure of e-learning tools emphasize the importance of having an interactive component and improving the principles of its development. However, these issues are just beginning to be studied.

The purpose of this article is generalizing the experience of introducing digital

resources in the study of mathematical disciplines by students of economic specialties; study of factors that ensure motivation of students in distance learning conditions; determination of the influence of the use of interactive learning digital resources on the effectiveness of the formation of student motivation factors.

THEORETICAL FRAMEWORK

In the general case, motivation is considered as a process of influencing oneself or another person in order to encourage certain actions that are necessary to achieve a predetermined goal. In our study, such a goal is the acquisition of theoretical knowledge in mathematical disciplines and practical skills in their application to solving real economic problems. And it is necessary to direct students' aspirations to achieve this goal. The effectiveness of managing this process largely depends on how successfully the factors of external and internal motivation work, that is, how well the levers of influence are correctly chosen.

When building a motivation system in the educational process, such theories of motivation as the Social Cognitive Theory and the Self-Determination Theory are used (Schunk, Meece, & Pintrich, 2014). According to the Social Cognitive Theory, a person acquires new knowledge as a result of social interaction. Depending on whether the reward or punishment is received by the person whose behavior is considered as a role model, the observer makes a relevant decision about his actions in similar circumstances in the future.

Self-Determination Theory is based on distinguishing motivation into two types: external and internal. Central to this theory is the distinction between autonomous

and controlled motivation. Autonomy implies that a person makes decisions according to his feelings and experiences. Intrinsic motivation is an example of autonomous motivation, when a person learns what is interesting to him, he considers it important, and therefore he applies willpower to it.

On the contrary, external motivation assumes that a person is driven to perform certain actions by external pressure, the feeling of the need to participate in these actions, social factors, etc. It should be noted that in general, external and internal motivation are not considered as two opposite poles. Between them there is a continuum of different forms, which to one degree or another combine these two types of motivation.

In turn, the choice of motivation methods is related to the learning model, which is the leading one when studying one or another discipline. The most common are four models (Vermunt, & Donche, 2017): learning that is focused on reproduction; meaning-oriented learning; learning that is focused on implementation; learning that does not have a specific orientation. In the case of using a model of learning that is focused on reproduction, the student is motivated only to reproduce the educational material during the test.

The meaning-oriented model of learning assumes that a student must understand the relationship between various structural elements of an educational discipline, be critical of the information he receives. He regulates his own learning and strives to achieve the most complete understanding of the material studied within the given academic discipline.

Studying according to the embodiment-oriented model, the student's efforts are aimed at determining the connections between the knowledge he receives and

the possibilities of their application in his future professional activity. It can be expected that the use of interactive learning technologies in combination with the possibilities of digitization will increase the effectiveness of learning in the implementation of any of these models.

The first studies of motivation to study during the period of quarantine restrictions related to the epidemic of COVID-19 revealed that the majority of students were tuned to a model of learning that is oriented to reproduction (Rahiem, 2020). And our experience also proves this. Such students were not ready for autonomy in learning, and for them the most effective was external motivation in the form of grades as a reward for completing tasks, as well as in the form of penalties for ignoring tasks. Some students even lost motivation to study, which can be explained by their lack of psychological stability (Cole, Field, & Harris, 2004).

But among the students there were those who perceived some aspects related to distance learning as advantages (Rahiem, 2021), namely, personal (challenge, curiosity, self-determination, satisfaction), social (well-being, relationships) and external environment (convenience, release of additional time). For such students, electronic learning tools made it possible to find additional motivational resources.

And it can be expected that digital resources are the most capacious in this context. It is they that allow creating conditions for the development of internal motivation among those students who are focused on determining the meaning of acquired knowledge and their further implementation in practical activities.

In our research, the results of which are presented in this article, we see the task of

the teacher in the development of such a structure of digital resources, which would not only support external motivation, but would help to form in students, as future specialists in the field of economics, internal motivation for in-depth study theoretical provisions of mathematical disciplines, as well as mastering mathematical methods and gaining practical experience in their application to solving real economic problems.

METHODOLOGY

During the 2020/2021 and 2021/2022 academic years, the performance of full-time students of the Simon Kuznets Kharkiv National University of Economics in the first and second years of study was monitored in terms of mastering mathematical disciplines in the conditions of remote learning. To ensure a full-fledged educational process, a wide range of digital resources of different levels of interactivity were used.

The virtual learning environment was created on the Moodle LMS platform, which is a fully customizable learning management system. Quantitative analysis of students' success, which was carried out throughout the educational process for each type of tasks, was combined with qualitative analysis, which was based on a questionnaire of students upon completion of the study of the discipline. The list of tasks to be completed by students during the semester was given in the course syllabus.

This syllabus also provides a rating scale for each type of task. Overall success was evaluated according to the cumulative system, for which a 100-point scale was used. All learning resources were posted on the website of the educational discipline of the personal educational systems of S. Kuznets KhNUE and have

been in open access for students since the very beginning of studies.

For a more detailed study, three academic groups of students of the 2nd year of the specialty Entrepreneurship, Trade and Stock Exchange Activity with a total number of 69 people were chosen. Monitoring their performance in the first year showed that the average performance in these three groups can be considered the same. In the second year, when studying the discipline Operations Research and Optimization Methods, great attention of the third group students was paid to interactive elements of learning, and instead of the usual homework, students passed tests and performed training exercises.

For students of the first and second (control) groups, traditional tasks from the textbook were offered. It should be emphasized that training of all these groups follows the same syllabus, and all students had full access to learning resources. In addition to the monitoring of student academic performance, monitoring of what types of resources students chose and for how long they used them was carried out. After the evaluation of the acquired knowledge and skills, which consisted of an ongoing assessment during the semester and a final assessment in the form of an exam, a student questionnaire was conducted in order to determine their own attitude to factors aimed at forming internal motivation to study. To process the results of the questionnaire (which is essentially an expert assessment), the method of vector preference will be used.

RESULTS

The experience of using the Moodle LMS for the organization of student learning is being accumulated at S. Kuznets KhNUE, starting from 2008. For correspondence

students, digital resources using Moodle LMS are already a familiar tool. It is on their using the independent work of students is built when studying by correspondence. But for full-time students, interactive learning has become actively used only in recent years, which was due to the COVID-19 epidemic.

Although some elements of interactivity (for example, tests, exercises for self-checking, business games) were also used in the process of teaching to one extent or another, but this was not mandatory and completely depended on the teacher's preferences. As a rule, for full-time students, digital resources mainly contained reference information.

However, in quarantine conditions, to ensure the effectiveness of training, it was necessary to use such learning digital resources that would contribute to the active involvement of the student in the learning process itself. Moodle LMS provides great opportunities for adapting the educational process to the distance format at all levels - from content creation to assessment of acquired knowledge. Each teacher has the opportunity to create his own website, on which to present a complex of digital resources in a digital format.

The following structure of the complex of the digital resources was proposed for mathematical disciplines. It contained a syllabus, a detailed work program of the academic discipline, a work plan (technological map) with a rating scale for each task, a list of recommended literature, links to useful Internet resources, lecture materials and their presentations, methodological materials for practices and labs, sets of homework, sample tasks of control works, training exercises, test tasks for self-diagnosis, multimedia publications, which are the authors' own development in co-

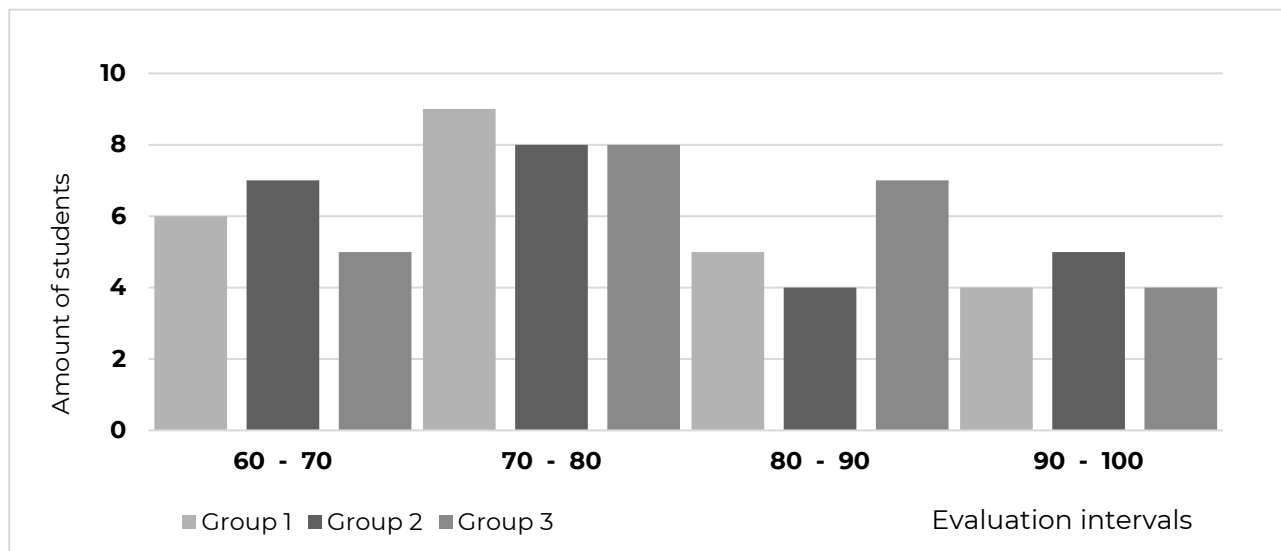
authorship with by other teachers of the department, as well as materials and resources for online final control (exam). It should be emphasized that one of the advantages of such electronic complexes is the ability to quickly update them.

According to the results of monitoring the academic performance of students of the first year of study, three academic groups were selected who study under the same program and whose success in

mathematical disciplines can be considered the same on average. These students participated in a detailed exploration. The average level of academic performance of the students of these three groups based on the results of the evaluation of the disciplines of the mathematical cycle studied in the 1st year (Higher Mathematics, Probability Theory and Mathematical Statistics) is 73-76 points on the ECTS scale (Fig. 1).

Figure 1

Distribution of academic success of students of the explored groups according to the results of studies in the disciplines of Higher Mathematics and Theory of Probabilities and Mathematical Statistics



Therefore, the sample population of students can be considered homogeneous according to the initial level of knowledge, which is the necessary condition for the purity of the experiment regarding the results of the introduction of interactive components into the educational process. The hypothesis to be tested is the positive impact of the implementation of digital resources in the education on the success of students due to the formation of both external and internal motivation to study.

Let's consider the factors affecting the external motivation of students. To ensure it, the system of automated current control was used, which is part of the complex of digital resources. This control system has two levels of adjustment. At the administrator level, the time when the student was on the website and which resource he uses are automatically recorded.

At the teacher level, the system allows monitoring attendance at classes, completion of mandatory tasks and self-

monitoring tasks. At this level, the system has the form of an electronic journal, in which the teacher assigns points for completed tasks according to the technological map. In addition, the rating of each student is automatically

determined among those students assigned to the academic discipline (academic stream). In fig. 2 shows an example of a current control page in an electronic journal.

Figure 2

View of the own student' page of the electronic journal of the current monitoring of the success in the academic discipline Operations Research and Optimization Methods

📁 Homework on topics 1-3	3.0	0-3	1/69
📁 Homework on topics 5-8	3.0	0-3	1/69
📁 Homework on topics 9-10	2.9	0-3	4/69
📁 Laboratory works №1-3	6.0	0-6	1/69
📁 Laboratory works №4-6	6.0	0-6	1/69
📁 Control work №1	7.9	0-8	1/69
📁 Control work №2	3.0	0-4	11/69
📁 Control work №3	3.6	0-4	2/69
📁 Colloquium №1	6.3	0-8	8/69
📁 Colloquium №2	3.3	0-8	42/69
📁 Independent creative work	7.0	0-7	1/69
📁 Exam	-	0-40	-
Σ Course total Include empty grades.	53.7	0-100	3/69

The left column of numbers corresponds to the points the student received for each current assignment, the center one is the range of points that can be obtained for that assignment, and the right one is the student's ranking among the total number of students in the stream (fig. 2).

Every student in the group has access to the electronic journal. The presence of the electronic journal configured in this way gives impetus to the formation of external motivation for the student not only from the teacher's side, but also from the side of other students, as it creates conditions for open competition between students, healthy competition, which strengthens the personal desire to get a better grade. In addition, establishing a rating for each

student personally contributes to the activation of his social desire to fulfill his obligations to his parents, in case the student studies under a contract, or seeks to receive a scholarship, which is assigned depending on the student's position in the rating.

Let us now consider the measures that were taken to develop students' internal motivation. Online (in synchronous mode), the educational process for students of both the experimental and control groups was built as follows. Students receive basic theoretical information during lectures, and practical skills are formed by studying typical examples and discussing situational tasks that took place on practices and labs. Also, students improve

their knowledge during independent work thanks to the completion of a set of specially designed tasks.

These tasks involve independent mastering of mathematical methods for solving economic problems of various levels of complexity. The results of independent work were discussed on practices and labs. Since the ability to make responsible and informed decisions in the future professional activity depends on the desire to study independently, the question of finding effective factors influencing the formation of their internal motivation to study arises precisely at the stage of engaging students in active independent work.

Practical and laboratory classes for the 1st and 2nd (control) groups were conducted online in the usual format using traditional methods and techniques of teaching. Students of these groups were recommended printed publications (textbook, manuals, and methodical recommendations), electronic publications (similar to paper publications in pdf format) and other useful links as

educational material that should be used during tasks for independent work.

They also had free access to the website of the discipline, where the full complex of digital resources was presented, and, accordingly, they could use all resources, but the use of interactive elements of these resources was not mandatory for them.

For students of the 3rd (experimental) group, practical and laboratory classes were conducted in the mode of active use of interactive technologies. For example, although lectures were given for the academic stream in a traditional format, along with this, mini-lectures of a debatable nature were held for students of the 3rd group in practical classes. These lectures were accompanied by specially designed audio presentations. Such mini-lectures were presented by the students themselves, while the teacher played the role of a moderator. Also, during the classes, an express survey was conducted in the format of closed-type or open-type interactive tests (Fig. 3).

Figure 3

An example of an open-type test task on the topic "Simplex method"

By what value will the objective function decrease when switching to a new basic solution?

Basis	Cb	Cj	-6	-2	0	0
		bj	x1	x2	x3	x4
x3	0	8	2	3	1	0
x4	0	12	1	7	0	1
Zj		0	0	0	0	0
$\Delta_j - Z_j - C_j$			6	2	0	0

Answer

Interactive training exercises were developed to master mathematical methods and apply them to solving economic problems. They allowed

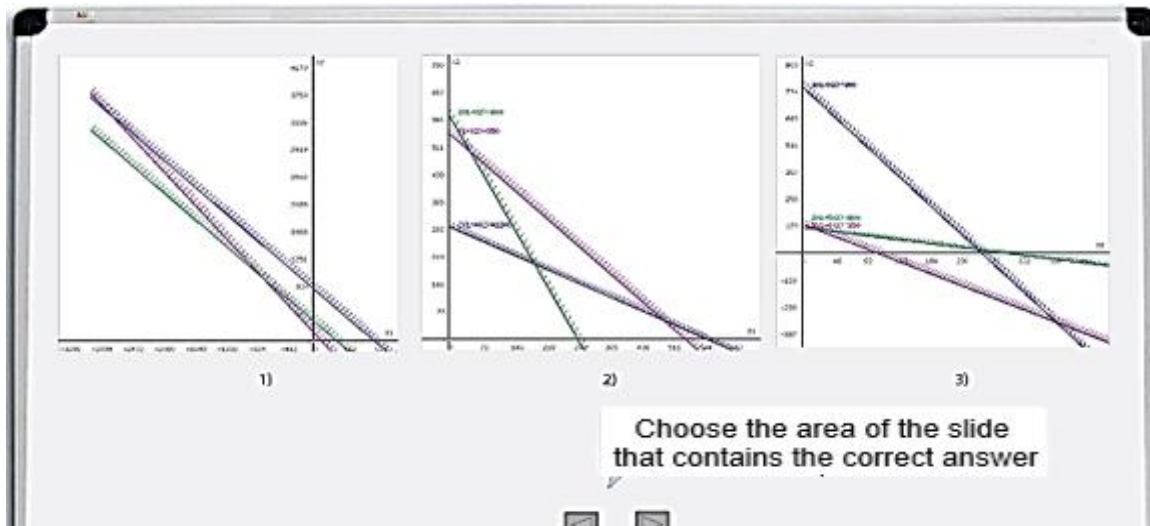
checking all key points during the solution process, and in the case when a mistake was made, hints were automatically turned on that helped to find the right way

(Fig. 4). The development of such exercises was carried out both in practical classes and during independent work based on

the materials of electronic multimedia publications.

Figure 4

A fragment of a training exercise on the topic "Graphic method of solving linear programming problems"



In the laboratory classes, which were held in the same format for all academic groups, applied economic problems were solved with the help of built-in functions and MS Excel add-ons. But homework in the control group additionally included performing interactive test tasks of a combined type, namely closed, open tasks and essays.

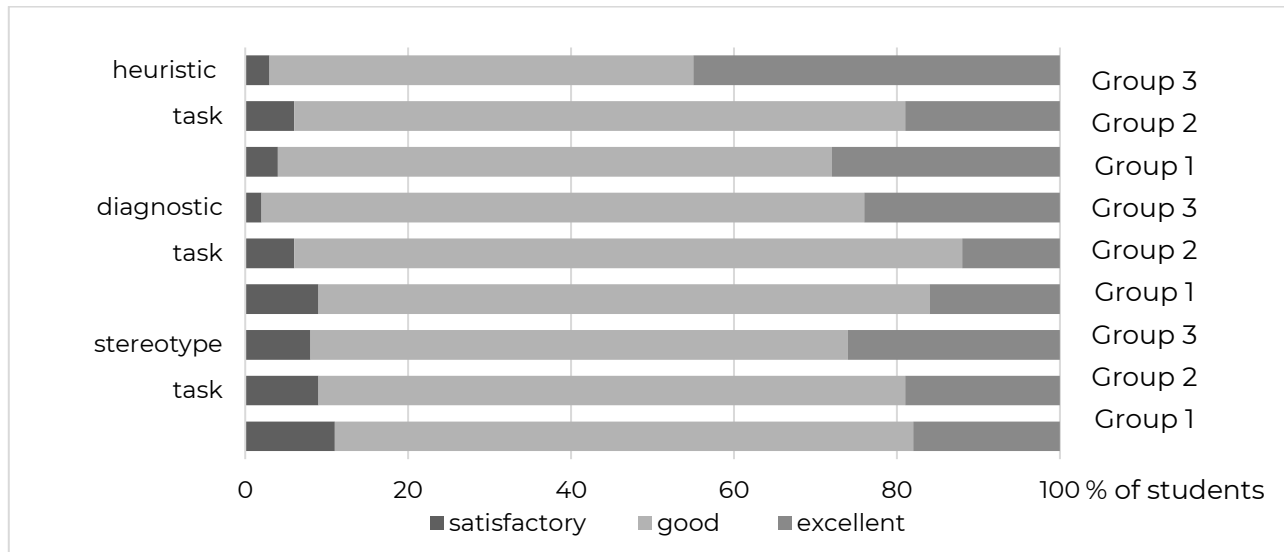
In order to perform the tasks of independent work, the students of the experimental group were recommended to additionally use the material of multimedia publications in the discipline "Operations Research and Optimization Methods" in addition to the general educational literature. All students of the university have access to these digital resources, as they are placed not only on the teacher's website, but also in the repository of electronic publications of S. Kuznets KhNUE. But the realization of tasks according to these resources was mandatory only for the students of the experimental group.

The final control of acquired knowledge was carried out in the form of an exam. Students had to complete five tasks. Among them, there were two stereotypes, which demonstrate only the level of assimilation of basic concepts and the ability to use standard algorithms for solving; two diagnostic, which have a meaningful statement of the economic problem and require the construction of a mathematical model and the determination of the optimal solution; one heuristic task is an economic problem with real data, which involves choosing and justifying a solution method and checking alternative options. Students of all groups coped with the tasks (Fig. 5).

However, the students of the experimental group provided more complete and well-grounded answers to heuristic tasks, demonstrated a clear understanding of the material, creativity, autonomy, and creative abilities, and obtained better results.

Figure 5

Evaluation diagram of each of the exam tasks



In order to determine the attitude of students of the experimental group to study and their level of interest, students were asked to evaluate the digital resources in the context of their influence on the formation of the most important factors of internal motivation to study.

Among the factors proposed by the students, the following were highlighted: x1 – formation of creative cognition methods, x2 – acquisition of scientific and

research skills in future professional activity, x3 – acquisition of new knowledge and practical skills in the academic discipline, x4 – realization of individual abilities, x5 – opportunities to show personal initiative, x6 – optimization of training time. Students, acting as experts, assigned ranks to each factor of internal motivation, based on their personal perception of their importance and implementation thanks to the active use of digital resources (Table 1).

Table 1

Ranks of factors of students' internal motivation to study

Number of the expert	Ranks of factors					
	x1	x2	x3	x4	x5	x6
1	2	1	3	5	4	6
2	1	3	2	4	6	5
...
23	2	1	4	3	6	5
24	1	2	3	4	5	6
Sum of ranks	52	49	45	111	125	122
Average arithmetic rank	2.2	2.0	1.9	4.6	5.2	5.1
Final rank	3	2	1	4	6	5

To form a generalized assessment of a group of experts, their answers were averaged, determining the average arithmetic ranks. So, in the opinion of students, the factors that contribute to the formation of internal motivation, in order of decreasing importance, can be presented in the form of a series:

$$x_3 > x_2 > x_1 > x_4 > x_6 > x_5 \quad (1)$$

So, according to the students who studied using interactive technologies, the most influential factor of internal motivation is the acquisition of new knowledge and practical skills, that is, students are really interested in learning, and not just in evaluating their results from the teacher.

DISCUSSION

Thanks to the ability to determine the student's rating during the current control, the traditional system of success assessment is being modernized, reorientation of this system to increase the motivation in active and responsible learning. The competitive approach promotes the development of self-assessment skills as a means of self-development, creating conditions for students to plan individual educational trajectories. Such evaluation of students' success is a sufficiently effective factor not only of external, but also of internal motivation.

Thus, theoretical provisions (Domenico, & Ryan, 2017) regarding the organization of motivation levels were practically implemented. If for most students of the control groups, motivation was external, then thanks to the implementation of interactive technologies for students of the experimental group, motivation was internal, and its basis was the cognitive component that is consistent with thought (Schunk, Meece, & Pintrich, 2014).

It is internal motivation that is the driving force for increasing the effectiveness of

training, as evidenced by the results of the current and final control. Multimedia technologies contributed to a better development of one's own educational space compared to digital resources discussed in the paper (Gurevich, Kademiya, & Shevchenko, 2012), and this created more comfortable conditions for learning.

Our experiment is an example of the development of separate theoretical propositions regarding the influence of information technologies on the educational process (Cole, Field, & Harris, 2004) and its development, respectively to modern requirements of society. Thus, it is confirmed that the digitalization of the educational process activates the theoretical-cognitive and research activity of students, which affects the formation of their ability to comprehensively analyze different views and to clear arguments in the course of substantiating their conclusions.

CONCLUSIONS

A comparison of the results of the assessment of students' academic performance with the results of their questionnaire regarding the effectiveness of educational technologies, which determine the formation of internal motivation in the conditions of distance learning, shows that the use of digital resources provides an opportunity for future economists and managers to successfully master the disciplines of mathematical direction.

The main factors that increase the effectiveness of education are the formation of a tendency to creative cognitive search, the acquisition of skills for analyzing and solving real problems of the economy, the disclosure of individual abilities, and the creation of a comfortable educational space. It should be noted that

the experiment participants' awareness of their role and the teacher's increased attention to them are also additional factors of motivation.

In further research, it is planned to extend the use of digital resources to other mathematical disciplines, as well as to consider the use of such an element of interactivity as gamification in the analysis of real economic problems.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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АНОТАЦІЯ / ABSTRACT [in Ukrainian]:

МОТИВАЦІЯ СТУДЕНТІВ ЕКОНОМІЧНИХ СПЕЦІАЛЬНОСТЕЙ ДО ВИВЧЕННЯ МАТЕМАТИЧНИХ ДИСЦИПЛІН ПРИ ВПРОВАДЖЕННІ ЦИФРОВИХ РЕСУРСІВ

Метою роботи є аналіз технічних, методичних та психологічних аспектів діджиталізації освіти та, зокрема, методів забезпечення ефективності самостійної роботи студентів в умовах дистанційного навчання. Основна увага приділяється проблемі формування зовнішньої і внутрішньої мотивації студентів економічних спеціальностей до вивчення дисциплін математичного спрямування завдяки використанню інтерактивних освітніх технологій.

Методика: в умовах електронного навчання здійснювався безперервний моніторинг успішності оволодіння студентами математичними методами та їх застосуванням для розв'язування економічних задач. Визначалась як успішність студента при виконанні певної роботи, так і його загальний рейтинг серед інших студентів групи. Ці дані доповнювались результатами анкетування студентів стосовно їх власного ставлення щодо інтерактивних технологій як інструменту, спрямованому на формування мотивації до навчання.

Результати: віртуальне середовище для е-навчання було побудовано на платформі Moodle LMS і містило цифрові освітні ресурси різного рівня інтерактивності, у тому числі й електронні мультимедійні видання, що у повному обсязі забезпечувало потреби освітнього процесу. Для формування зовнішньої мотивації студента автори використовували електронний журнал, в якому визначені види поточних завдань, бали за їх виконання, рейтинг студента за кожним видом завдань, а також за всіма видами завдань у цілому. Для підтримки внутрішньої мотивації були розроблені та впроваджені інтерактивні елементи навчання. Ефективність застосування цифрових освітніх ресурсів була підтверджена в ході моніторингу успішності студентів та за результатами їх анкетування.

Висновки: суттєвою перевагою застосування інтерактивних компонентів у навчальному процесі слід вважати створення засад для кращого розуміння теоретичного матеріалу та застосування використання математичного апарату для розв'язання реальних

економічних завдань. Використання багаторівневих цифрових освітніх ресурсів дає можливість студентів вибудовувати індивідуальне освітнє середовище, що підвищує внутрішню мотивацію до навчання.

KEYWORDS: цифрові освітні ресурси; електронне мультимедійне видання; індивідуальне освітнє середовище; дистанційне навчання; зовнішня і внутрішня мотивація.

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