Using Digital Technologies to Improve the Efficiency of Discussion Environments for Economics Students During COVID-19

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ABSTRACT

The article is devoted to studying the impact of digital technologies on providing an efficient educational discussion environment against the background of isolation and social distancing caused by COVID-19 preventive measures. The course structuring allowed fostering a better understanding of educational activities. The use of popular online communication tools positively influenced educational communication effectiveness. The conscious attitude to training facilitated the formation of a corporate culture of engagement in the learning environment. Thematic and consulting support provided by academic assistants allowed forming a sense of confidence. The implementation of the concept of business gamification provoked an increase in students' interest in practical training and entailed greater participation in learning. The relevance of the creative work topic enabled students to express their own view on professional activity and reinforced the desire for using the gained knowledge and experience in practice.

KEYWORDS

Digital Platforms and Tools, Discussion Environment, E-Learning, Effectiveness of Online Practices, Functional and Physical Readiness

1. INTRODUCTION

The sudden outbreak of the COVID-19 has led to the immediate closure of schools, colleges, and universities. Educational institutions worldwide have shifted from traditional teaching methods to e-learning as the introduction of isolation and social distancing was enforced as a preventive measure against the spread of coronavirus infection. In these conditions, e-learning has proven to be an essential tool for delivering effective education during isolation (Soni, 2020). It is often referred to as a general concept of online teaching and learning with technological tools and platforms providing a wide range of applications and processes for implementing learning practices (Abbas *et al.,* 2005). The widespread use of technology, constantly updated information, the need for open access to educational resources and training individualization have resulted in a profound shift in pedagogical approaches. Wireless technologies and mobile devices acquired a prominent role in popularizing the concepts of distance, online, and mobile learning (Talan, 2020).

Advanced technologies provide innovative and sustainable solutions to tackle disruption during crises and help people communicate and work virtually without the need for face-to-face contact. This leads to many systemic changes in organizations as they adopt new technologies to interact and work (Mark & Semaan, 2008). Educational institutions are introducing e-learning with the aim of improving teacher-student communication, facilitating effective knowledge exchange, and developing interaction in the learning environment to accomplish educational objectives (Basak *et al.,* 2016). Mobile technologies are able to give immediate access to unlimited information from anywhere and anytime through specially developed applications. They allow students to interact with information easily and enable technology for educational purposes (Talan, 2020). The process of training often benefits from various internet-based technological tools distributed via the web (Muhammad *et al.,* 2016*;* Zhigareva *et al.,* 2019). In this day and age, digital educational technologies have become more ubiquitous than ever. They offer flexible opportunities promoting convergence and creativity as well as open up new forms and models of organizing and managing educational processes (Chien *et al.,* 2020; Vorbach *et al.,* 2019).

The social distancing has provoked the urgent need for more widespread use of online platforms and digital tools that create remote education opportunities. E-learning platforms can help education providers manage, plan, deliver and track the learning and teaching process. Factors affecting their effectiveness include those related to technological issues, e-learning system quality, culture, self-efficacy, and trust (Almaiah *et al.,* 2020). In the meantime, the overall success of e-learning depends on internet connection quality, learning software, digital skills, and availability and access to technology.

Given the current situation, e-learning systems remain vital to support inclusive and distance education (Onyema *et al.,* 2020). E-learning encourages students to work together, develop their academic competence, improve self-efficacy and promote social and cognitive skills (Ngai *et al.,* 2019). It is no question that e-learning brings positive results, but its final outcome depends on the context (Adarkwah, 2021). In this connection, the planning of e-learning scenarios is an absolute must for academic institutions (Rieley, 2020). Well-designed personalized technology-aided learning programs can significantly increase hands-on training productivity (Muralidharan *et al.,* 2019). The effective use of digital technologies should be driven by learning and teaching goals rather than a specific technological function that does not in itself lead to increased attainment (Azevedo *et al.,* 2021).

Given the currently limited teacher-student communication capabilities caused by COVID-19 preventive measures, the introduction of adequate technological tools, as well as innovative teaching styles and methodologies, is represented as a key demand to support high-quality training in higher education institutions. In this regard, the purpose of the study is to investigate the impact of digital technologies on the efficiency of educational discussion environment during global isolation and social distancing. To achieve this goal, the following tasks were set:

- develop a Digital Technologies and Management e-learning course on the basis of Within the framework of bachelor's degree programs of the L.N. Gumilyov Eurasian National University (Kazakhstan), Kazan Federal University (the Russian Federation) and the Financial University under the Government of the Russian Federation (the Russian Federation);

- Conduct an educational experiment (September-December, 2020) using a web-based learning management system (Canvas), online communication tools (Viber Messenger, Runkeeper), and a social network (Facebook);
- Develop and test the concept of gamification within the practical part of the course;
- Assess the observance and implementation of the principles of the educational course at all training stages;
- Identify factors influencing the efficiency of the educational discussion environment.

2. MATERIALS AND METHODS

Since practical human activity is formed, realized, and limited by combinations of arrangements that compose practice architectures, this particular theory was taken as a basis in developing the concept and structure of the e-learning course (Sjølie *et al.,* 2020). The theory of practice architectures presents practices as comprised of sayings, doings, and ties related to one project, idea, or goal. These three elements are always combined and happen in three dimensions of intersubjective space: (1) semantic space, where we meet each other as interlocutors (the language context); (2) physical space, where we meet each other as embodied beings (in the context of activity and work); and (3) social space, where we meet each other and the world as social beings (in the context of solidarity and power) (Nicolini, 2012). Apart from this, the practices are enabled and constrained by three different types of agreements: (1) cultural-discursive agreements (e.g., languages, discourses), (2) material-economic agreements (e.g., offices, classrooms, digital technologies) and (3) socio-political agreements (e.g., hierarchies, collegial relations, state-university ties) (Kemmis & Edwards-Groves, 2018).

Modern technological tools and e-learning platforms provide an opportunity to simulate quasi-professional practical activities in the framework of educational processes, thereby contributing to the effective achievement of educational goals. Popular online communication platforms that are rapidly being introduced into education all around the world include Start.me, Neo, Classtime, Classwize, Ted-Ed, Coursera, Google Classroom, Bakpax, Pronto, Skillshare, ClassDojo, Edmodo, Blackboard Learn, Parlay, Docebo, Feedback Fruits, Udemy, WeVideo, WizIQ, Flipgrid, Codeacademy, Gynzy, Adobe Captivate, Seesaw, Edx, GoGuardian, Elucidat, Kami, Pluralsight, G Suite Otus, Articulate 360, Floop, Future Learn, Hapara, Shift, Lectora Inspire, Kialo Edu, Buncee, and LanSchool (Mishra *et al.,* 2020).

When developing the online course, the task was to achieve the synergy of high-quality training content and technological solutions. Consequently, those technological tools were selected, capabilities of which harmonized with the study goals. Canvas is a web-based learning management system (LMS) used by learning institutions, educators, and students to access and manage online course materials and discuss skills development and academic achievements. Canvas includes a variety of customizable instruments for course creation and management, course and user analytics and statistics, and intra-group communication. It provides curriculum designers and educators with an opportunity to create and share course materials using such tools as Assignments, Discussions, Modules, Quizzes, and Pages. Aside from this, Canvas enables fostering collaborative learning by means of Collaborations, Conferences, and Groups. Depending on course settings, students can access these areas in Canvas to find learning materials and interact with other course users. Provided that Canvas is originally web-based, any user can access this LMS on a mobile device from the Canvas Teacher, Canvas Student, or Canvas Parent applications (Canvas, 2020). Viber is a popular free online service for sending individual or group text messages and making audio and video calls (Rakuten Viber, 2020). Runkeeper is a cross-platform application that allows planning, making, and assessing the physical activity in order to ensure the desired level of functional and physical readiness to achieve life goals (ASICS Runkeeper, 2020). Facebook was used as the largest social network in the world, offering many functions for mutual interaction. It allows sharing photos, text messages, videos, statuses, and comments. For many users, visiting Facebook has become a part of daily routine (Facebook, 2020).

2.1. Research Design and Sample

The educational experiment involved 250 students of the L.N. Gumilyov Eurasian National University (Kazakhstan), Kazan Federal University (the Russian Federation), and the Financial University under the Government of the Russian Federation (the Russian Federation). Relevant data on the research participants are presented in Table 1 and Figure 1. The main selection criteria were the course and specialty of students. The main selection criteria were the course and specialty of the students, age or gender characteristics were not taken into account. Probable respondents were e-mailed invitations
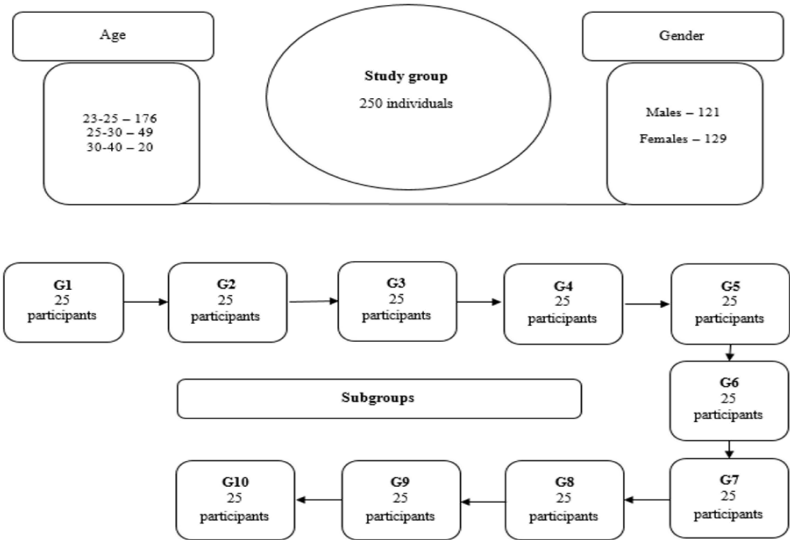
to participate in the experiment. After the answer was received, we analyzed the questionnaires of all students and selected those that meet the sampling criteria.

The study process implied holding a joint e-learning course named Digital Technologies and Management as part of a bachelor's degree program. The course was supposed to use the capabilities of a learning management system (Canvas), mobile applications (Viber Messenger and Runkeeper), a social network (Facebook) and last for four months (from September to December 2020).

Table 1. Research participants

Number of students	Study programs and directions	Educational institution
140	38.04.02 Management: - *Business Analytics;* - *Financial Marketing;* - *Financial Management and Capital Market;* - *Management of Sports Industry;* - *Project Management of Public-Private Partnerships;* - *Innovation Management and Entrepreneurship;* - *Project Management;* - *Management and International Business;* - *Corporate Governance;* - *Crisis Management and Consulting* - *Management Consulting*	Kazan Federal University (the Russian Federation) Financial University under the Government of the Russian Federation (the Russian Federation)
17	38.04.03 Personnel Management - *Human Resources Management*	
13	43.04.02 Tourism: - *Sustainable development of the hospitality and tourism industry*	
50	*6B04105 – Economics of Entrepreneurship and Business*	L.N. Gumilyov Eurasian National University (Kazakhstan)
30	*6B04110 – Public administration*	
	Total: 250 students	

Figure 1. Study group characteristics

*developed by the authors

The Digital Technologies and Management course was attended by students aged 23 to 40 (121 men and 129 women). The study group of 250 individuals was divided into ten subgroups, 25 people each. The role of training supervisors and advisers was performed by postgraduate students and graduate associates of the considered educational establishments. Each subgroup was assigned one academic adviser, whose functional responsibilities included consultative support in performing practical tasks and providing thematic communication and interaction on digital platforms. At the same time, they were supposed to analyze students' dynamics and activity by subgroups and draw reports on work results.

2.2. Research Limitations

Since the study aimed to determine the critical factors for increasing the efficiency of educational discussion environments, it fails to provide a comprehensive assessment of the effectiveness of the training course in general and the impact of the communication component in particular. From the students 'point of view, the course influenced the effectiveness of the considered educational discussion environment, as evidenced by indicators such as students' involvement, activity, efficiency, functional and physical readiness, and group communication quality at the forefront.

2.3. Ethical Issues

The experiment was carried out in compliance with all ethical standards and anonymity; there were no requirements to provide confidential information (name, surname, age or place of residence, etc.). Also written agreements from the respondents for the conduct and processing of data were received.

3. RESULTS

The results are based on the purpose and objectives of the study. Initially, an educational course was developed, the structure of which is presented according to three directions: theory, practice, and creativity (Figure 2). During the course, the following principles were actualized among students: personal and group responsibility, dedication, high-quality interaction, and self-management. Each part of the course had its own concept and was conducted utilizing different platforms. The theoretical part (offered on the basis of the Canvas LMS) was filled with online lectures, videos, and educational information resources. The practical part used the capabilities of Viber and Runkeeper applications and consisted of business cases, role-playing games, and group assignments, where research participants jointly developed solutions to practical problems relevant to modern business. The creative part of the course provided students with the opportunity to show creativity and innovation in solving management problems and share their professional views and ideas via Facebook. At the end of the course, acquired knowledge was tested by means of the Canvas LMS, and the proposed approach to organizing the educational process was evaluated by the students enrolled.

**Figure 2. E-learning course: concept and structure**
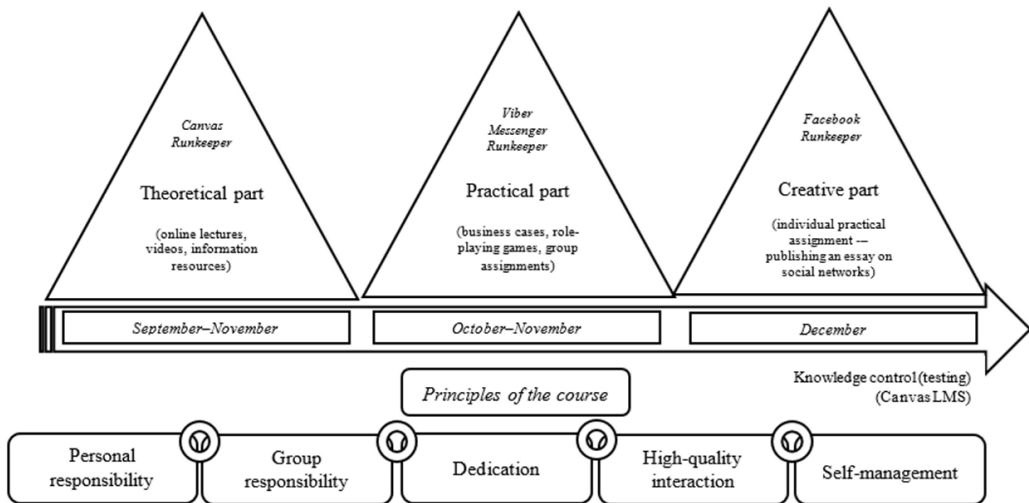
*developed by the authors

The practical part of the course was based on the concept of gamification to increase the efficiency of discussion environments. Its tasks were divided across ten departments of a company with three business cases each to imitate the real organizational structure of a modern firm. For instance, the Strategic Planning Department included business cases demanding management decisions in the strategic business planning segment. For their development, the structure of tasks required collective creativity and mutual cooperation. Hence, the capabilities of the Viber mobile application were used. The task of academic advisers was to lead the discussion to the right topic, monitor each participant's involvement, activity, and effectiveness, as well as record case solutions in a report. At the end of work in one department, a subgroups' transition to the next was carried out. Thus, all students involved had the opportunity to try on the role of managers of Strategic Planning Department, Production Control Department, Procurement Department, Foreign Economic Relations Department, Personnel Management Department, Innovative Development Department, Finance Department, Technology Department, Marketing and Sales Department, Health and Safety Department. Generation of practical management decisions in the structured learning environment provided the possibility to organize effective virtual teamwork and communication (Figure 3).

In order to consolidate theoretical and practical knowledge and skills, students were offered to individually develop comprehensive solutions for businesses of a certain segment with account taken of the modern realities influenced by COVID-19. For this, a separate group was created on Facebook for students to post their essays and share professional views and comments. The training course ended with a test.

Academic advisers evaluated the level of involvement and efficiency of discussion environments during all experiment stages. The results of a comprehensive assessment of the level of compliance and implementation of the educational course principles are presented in Figure 4. This assessment was based on academic advisers' reports and students' surveying results.

Figure 3. Gamification in the structure of the practical part of the course
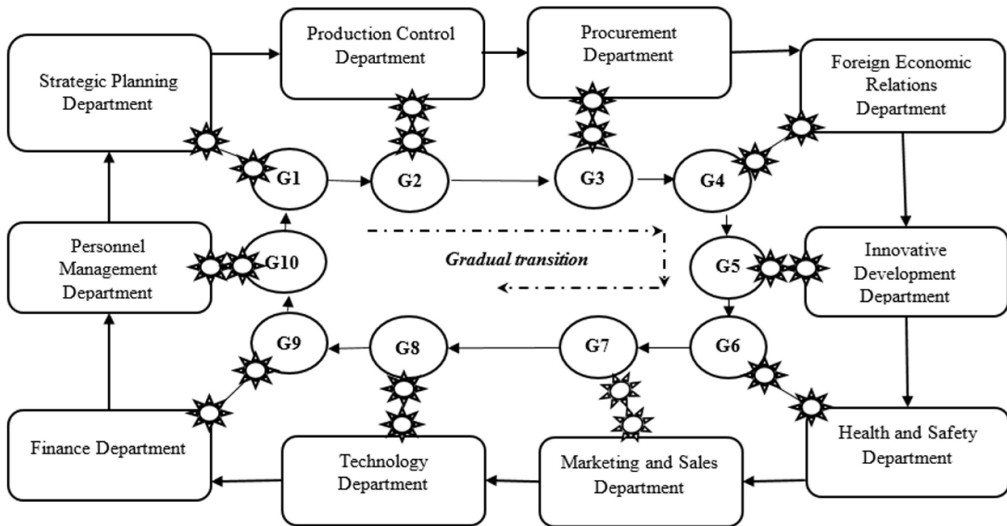
*developed by the authors

Figure 4. Level of compliance and implementation of the educational course principles
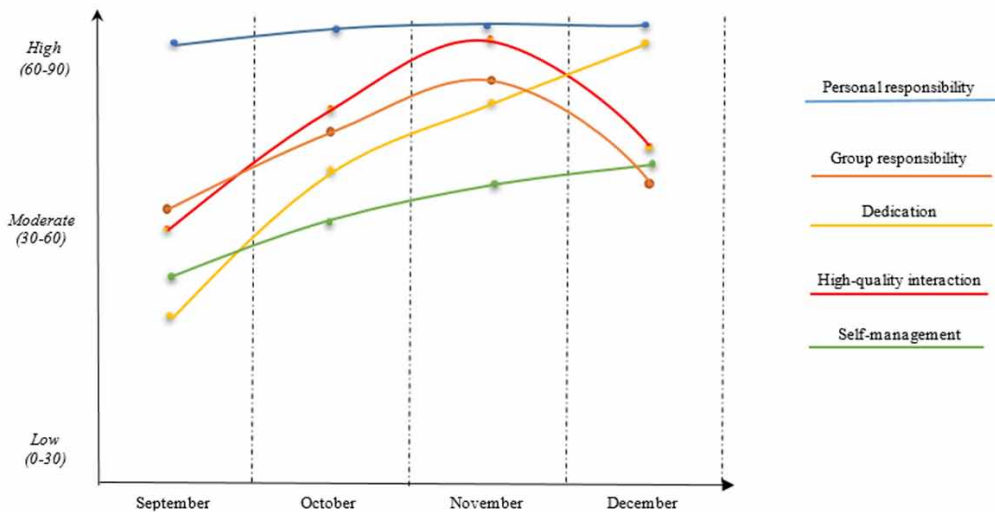
*developed by the authors

The results show that students' personal responsibility was at a relatively high level throughout the course, at the same time such indicator remained during all experiment and practically did not change. However, the dedication rates were not the same, but changed during the course from medium

to high. Indicators for other parameters also changed during the course. Accordingly, at the beginning of the course the indicators of group responsibility and high-quality interaction were at the average level, then gradually increased and in November reached a high level. However, after November, the figures fell again to the average level. Indicators on the criterion of self-management were at the average level during the course and varied slightly within this level. The study participants confirmed that the COVID-19 episode and consequences made them reconsider their views on education and take a more responsible attitude towards the educational process than before. At the initial research stage, students' group responsibility and functional readiness were moderate and reached a peak in the third month of study. During the survey, respondents drew a parallel between group responsibility and group assignments and confirmed that the structure of educational practices itself provides for maintaining a high level of responsibility for group interaction and personal self-efficacy. The last month of training was especially notable for a decrease in group responsibility and improvement in dedication level. Study participants associated a high level of dedication with personal aspirations to implement obtained knowledge and experience in practice and the desire to become a sought-after specialist in the current crisis conditions. Even though the level of self-management was remarked as moderate throughout the experiment, students declared absolutely no problems with self-organization, self-motivation, and self-control. Most experiment participants confirmed that the completed online course opened for them a qualitatively new educational experience filled with professional interest, relevance, and efficiency.

The results of the study show that the efficiency of the discussion environment was achieved by the effect of the following aspects:

- Training course structuring, which allowed students to form a clear understanding of educational activities and outline a strategy for the gradual acquisition of professional knowledge and experience;
- Group division, which determined the effectiveness of discussion platforms and made it possible to involve all students in intense learning activity;
- Participants' internationality, which aroused additional interest among students in different views on solving business challenges;
- Using familiar communication tools (Zoom, Viber Messenger, Facebook);
- Updating and promoting the principles of personal and group responsibility, dedication, high-quality interaction, and self-management at all stages of educational activity.
- Conscious attitude to training, which contributed to the formation of a corporate culture of engagement, proactivity, and efficiency in the learning environment.
- Thematic and consulting support, which formed the students' sense of confidence, comfort, and ease in the process of collective solution of practical problems;
- Implementation of business gamification, which gave a boost to the growth of students' interest in practical learning and involvement in educational activities;
- Relevant topic of creative work, which encouraged students to open an innovative view on professional activities and actualized the desire to use the acquired knowledge and experience in practice.

4. DISCUSSION

The recent surge in COVID-19 cases has increased panic and anxiety among the student community and raised uncertainty about the normalization of the situation (Kaur *et al.,* 2020). Crises and conflicts not only create chaos in people's lives but pose significant obstacles to education as well. In such moments, many students and teachers face psychological and emotional challenges. The resulting stress, fear, depression, and apathy may lead to an insufficient concentration on one's life and professional activity (Di Pietro, 2018; Kasirer & Shnitzer-Meirovich, 2021). In this respect, one of the major advantages of online education is that it gives a sense of psychological security against the backdrop of emerging

risks (Mishra *et al.,* 2020). Unexpected pandemic-related isolation highlights the benefits of being forward-thinking, reflective, and collaborative (Trombly, 2020). Limited communication opportunities caused by COVID-19 afford ground for finding numerous new motivations to work on a continuous basis. Social lockdown appeared to be a new scenario that we have never encountered. Therefore, many students afraid of missing the academic year tend to work harder, which is positively reflected in their academic performance (Gonzalez *et al.,* 2020).

During social distancing, learners should understand their role, form their own attitude and commitment, and find ways to self-motivate to get good educational outcomes. From this perspective, technology management, support from leadership, enhanced awareness of e-learning systems, and adequate digital skills from faculty and students are the most influential determinants in supporting the effectiveness of e-learning during COVID-19 (Alqahtani & Rajkhan, 2020).

Social networks and mobile applications can considerably improve the system of educational communication, allowing synchronized and non-synchronized interaction in the educational group. Chat rooms, virtual communities, social networks, wikis, blogs, or video-sharing websites have become focal points of the learning environment that bring interaction to another dimension (Denizalp & Ozdamli, 2019). They allow students to become a part of an online academic environment, create and share content, opinions and achievements, as well as be in touch with each other. Students view social media as a useful learning tool precisely due to its interactive and motivating effect. Proper management of social media tools can positively impact three key learning outcomes: knowledge, skills, and attitudes (Orús *et al.,* 2016).

To increase the effectiveness of modern online education, students should pay more attention to various educational applications. In turn, faculty are recommended to provide simple and engaging study materials that drag the attention of learners towards the digital format of interaction (Soni, 2020). Online courses should be more dynamic, interesting, and interactive. Substantial efforts should be made to humanize the learning process to the best extent possible. The power of digital technology and personal attention are the central factors able to facilitate students' easy adaptation to the new learning environment (Dhawan, 2020). At the same time, it should be borne in mind that students' motivation to use technology does not always translate into more effective learning, particularly if the use of technology and the desired learning outcomes are not closely aligned (Azevedo *et al.,* 2021). Educators need to consider individual differences when developing training policies to ensure that every student can reach their maximum potential within the proposed learning model (Yucheng *et al.,* 2020).

Learners and knowledge conveyors should understand that training online has both strengths and weaknesses. On the one hand, it can increase the effectiveness of preparing future professionals dramatically, ensure a variety of educational technologies in teaching economic disciplines and special courses, and form a responsible attitude among students to these courses' studying. On the other, under certain conditions, e-learning can significantly diminish the creative nature of preparation, cause problems with students' socialization outside the discussion environment, and weaken educators' influence on students' personal development.

Technological advances offer numerous opportunities for improving the quality of learning but yet may raise new social problems and enhance the risk of the digital divide between those who do and do not have access to potential internet benefits. The prerequisites for harnessing the potential of technological advances vary greatly between and within countries, suggesting that modern changes can exacerbate rather than bridge this digital gap (Jensen, 2018). On top of this, most countries have serious problems with technological infrastructure in rural areas. Consequently, e-learning standards can become a critical issue requiring increased attention (Shahzad *et al.,* 2021).

5. CONCLUSIONS

The results show that the indicators according to the selected criteria changed during the experiment: the dedication rates were not the same, but changed during the course from medium to high. Indicators for other parameters also changed during the course; at the beginning of the course the indicators of group responsibility and high-quality interaction were at the average level, then gradually increased and in November reached a high level and then fall to medium level again; indicators on the criterion of self-management were at the average level during the course and varied slightly within this level.

The basis for developing the course concept and structure was represented by the theory of practice architectures. The experiment highlighted such compulsory principles of successful education as personal and group responsibility, dedication, high-quality interaction, and self-management. Each part of the course had its own concept and was conducted on different platforms – this fact allowed making more accurate judgments on the experiment results. The study process revealed that throughout the course, students' personal responsibility was labeled as high. Research participants asserted that new phenomena in their social and educational activities caused by COVID-19 made them reconsider their views on education and become more responsible in this context than before. Besides, the examination unveiled a considerable increase in the level of students' group responsibility and functional and physical readiness during the first three months of the experiment. Research participants paralleled group responsibility and group assignments and indicated that the developed educational course contributes to high responsibility for group interaction and personal self-efficacy. The last month of training was notable for a drop in group responsibility indicator and an increase in dedication. A high level of dedication was predominantly linked with personal aspirations to use the acquired knowledge in practice and the ambition to become an in-demand specialist. Notwithstanding the fact that self-management was assessed as moderate throughout the training, study participants remarked no problems with self-organization, self-motivation, or self-control. As a result, most students surveyed claimed that this e-learning course opened up a qualitatively new educational experience for them that was filled with professional interest, relevance, and efficiency.

In total, the study authors and academic assistants came up with a conclusion that the efficiency of the discussion environment in the educational process was achieved through the course structuring; group division; participants' internationality; using familiar communication tools (Canvas, Viber Messenger, Runkeeper, Facebook); updating and promoting the principles of personal and group responsibility, dedication, high-quality interaction, and self-management; conscious attitude to training; thematic and consulting support; the method of business gamification; and relevant creative work topics. The practical significance and prospects of further research are based on the possibility of using the developed course not only for students of the Faculty of Economics, but also others. The problematic issue of the effectiveness of modern technologies in modern education and their impact on the discussion environment remains relevant. Also, the results can be used in a comparative analysis of the features of the use of modern technologies among students of different specialties or different countries.

ACKNOWLEDGMENT

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