Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
X International Scientific Siberian Transport Forum

E-learning for transportation professionals (post graduate program) during the COVID-19 pandemic

Marina Cherkasova*a,*, Vyacheslav Sirotkinb, Alexander Kostyukovb

*Rostov State Transport University, Rostovskogo Strelkovogo Polka Narodnogo Opolchenya sq., 2, Rostov-on-Don, 344038, Russia

Abstract

Transportation industry prosperity is closely connected with training of transportation professionals at all level of their education and in various economic and epidemiological situations. The study aimed to show the reactions of 1st year post graduate research students (transportation professionals) on key issues of e-learning during post-extreme period (October 2020-January 2021). To answer research questions connected with characteristics of post-graduate students’ reactions to remote e-learning, risks for the students and searching novel e-learning models, the questionnaire and a descriptive approach for open-ended and close-ended questions analysis, semantic method for assessing the language content obtained empirically, the quantitative-descriptive method for presenting the research results were used. 33 transportation professionals (Engineering Field, IT, Social Science and Humanities) took part in the survey. Face-to-face format of learning was preferred by 30.30 % students (“T” and “SH” respondents). Remote e-learning only was satisfied for 39.39 % students (“T” and “IT”). At that time desire to keep such e-learning experience was demonstrated by 48.48 % of the students. They were ready for e-learning returning. 39.39 % of all the students, except 3.03 % (“SH”) were ready to remote e-learning activity “when it is necessary”. E-learning risks were mainly associated with social adaptation in the digital learning environment. At the same time e-learning was pointed out as a chance for sustainable scientific activity.

© 2022 The Authors. Published by ELSEVIER B.V.

This is an open access article under the CC BY-NC-ND license (https://creativecommons.org/licenses/by-nc-nd/4.0)

Keywords: E-learning; COVID-19; post-graduate research student; transportation professionals; Post-Graduate Program.

1. Introduction

The cooperation of transportation business with science and education is one of the decisive factors in economic development of any country. Successful activity of such a complex diversified system and knowledge-intensive manufacturing is impossible without the training of highly qualified specialists with professional competencies.
meeting the requirements of a present industrial society. One of the most important parts of the business is linked with the transport industry, since the creation of new machinery and equipment, transportation of various products, analysis of traffic flows and logistics solutions, information processing, legal regulation within this business require highly qualified specialists who are familiar with novel trends and concepts of domestic and foreign industry development. The training of such specialists is carried out according to Post-Graduate Program of the Transport University. Advanced students (post-graduate students) are involved into two main areas: educational and scientific (for research degree).

2021-2022 is the period to evaluate the unique experience of the educational activity during the COVID-19 pandemic, analyze the pros and cons of distance learning and to search for novel educational model. The proposed and discussed educational models require adjustments due to the epidemiological situation instability and constant readiness of higher educational institutions to be involved into any format of learning activity (face-to-face, distance, mixed) using any technologies. IT technologies using is discussed from moral (Cherkasova & Taktarova, 2021), legal and regulatory basis points of view (Kryukova, 2019), the potential of a new cultural and educational trajectory (Cherkasova, 2021, Baeva et al, 2020, Murzina, 2020, Kümmel et al, 2020, Cidral et al, 2020, Isaeva, 2021). There are a lot of studies regarding secondary school education (Baeva et al, 2020, Kirsch et al, 2021) and higher school education (Baeva et al, 2020, Vezirov & Kostina, 2016, Mahyoob 2020) in new digital and epidemiological realities. E-learning potential for post-graduate student (transportation professionals) during the COVID-19 pandemic is not presented in details (Martynov et al, 2020, Sklyarova & Malyshev, 2021). At the same time full remote e-learning activity in the world remains unexplored in the context of organizing and evaluating process of education during 2020-2021, in the period of the COVID-19 pandemic.

2. Russian Post Graduate Program (School)

Russian Post Graduate Program (School) is an educational institution for training scientific and scientific-pedagogical personnel (post-graduate students) in various areas. Admission to Russian Post Graduate School is regulated by local regulations. Russian Post Graduate School is the 4th level of education after Bachelor's Degree (4 years), Diploma of Specialist (5 years), Master's degree (2 years). Applicants to Russian Post Graduate School take (as a rule) 3 exams: Foreign language, Philosophy and Special discipline (according to the specialization). These entrance tests diagnose the applicant's readiness for research, creative and analytical work. The goal of Russian Post Graduate School is to prepare students to defend thesis for a research degree. Postgraduate curriculum contains specialized subjects to pass 3 candidate exams and perform research work. Individual research work takes the most part of the curriculum to form new scientific approaches and to follow novel trends in science and industry. Russian Federation is interested in the successful functioning of Post Graduate School and highly qualified personnel training to require research and professional competencies. Cooperation of the industrial complex with science and education is one of the decisive factors in the country's economic development.

Reforms and integration of Russian Post Graduate School into the system of multilevel Russian higher education according to the law “On Education in the Russian Federation” and its other issues raise a number of questions and discussions. Russian scientists V.S. Senashenko, E.A. Terentev, B.I. Bednyi emphasize the need to revise the structure and content of highly qualified personnel (post graduate students) in-depth professional training, in the framework of so-called “industrial” Post Graduate School.

The analysis of transformations and innovations, reforms of postgraduate education were presented in details in Russian scientific and educational environment. But the transition to full remote e-learning or mixed learning during the period of COVID-19 pandemic has been demonstrating the need to revise the structure and content of the educational and research component in Post Graduate School. The unique experience of extreme and post-extreme e-learning in Post Graduate School has received systematic coverage neither in Russian nor in foreign scientific studies. Practical activities of the authors of this study during the period of extreme and post-extreme e-learning allowed to put forward a hypothesis that during post-extreme e-learning period (October 2020-January 2021) 1st year post-graduate students of all transport specializations acquired stable e-learning competencies and desire to continue training in a distance format for implementation of independent research activity within the framework of novel trends and areas of the industrial complex.

Research Questions:
RQ1: What is the reaction of 1st year post-graduate students (transportation professionals) to remote e-learning during the post-extreme period (October 2020-January 2021)?
RQ2: What are the risks of remote e-learning for transportation professionals?
RQ3: Which model of learning is the most preferable from the point of view of the post graduate students (1st year) and why?

The study aimed to show the students’ reactions (1st year) on key issues of remote e-learning during post-extreme period (October 2020-January 2021) on the base of empirical data and to show a potential model of transportation professionals’ learning in Post Graduate School.

3. Theoretical Background and Literature review

The history of e-learning is more than 2 decades. E-learning is associated with so-called “correspondent learning” or learning by mail (Khusyainov, 2014), dating back to the beginning of 18th century. At the very beginning e-learning was associated with electronic books and Learning Manager System. It was a smooth transition from traditional education to electronic (E-learning) that was discussed and implemented on the basis of its constant integration into the educational process both in Russia and in other countries (Al-Fraihat et al, 2019). Educational activities with Internet technologies only have not been considered in the scientific literature. The step-by-step integration of e-learning into traditional education was supposed. Russian authors dealing with the problems of e-learning note different perceptions of e-learning before COVID-19 pandemic and during the full lockdown. According to A.V. Solovov, A.A. Menshikova, O.V. Mikhailov, Ya.V. Denisova negative assessments prevail. Violation of authenticity and confidentiality were the main risks before complete self-isolation. But in isolation, the availability of the digital learning environment and violation of the integrity of the whole educational system were pointed by 70 % of teachers (Baeva et al, 2020). L. Baeva et al., based on the opinion of experts from different countries (Russia, Europe, USA, Africa) note an unambiguously positive impact of e-learning on the educational process in higher education but not in secondary school. The reasons for such a differentiated attitude are in the independence and high motivation of higher school students but not high school students. The analysis of the university digital learning environment in Post Graduate School is presented in the study (Sklyarova & Malyshev, 2021). E-learners' characterization for the postgraduate level (4 % Doctoral Degree level of all respondents) was partially considered in the study by Brazilian and Portuguese scientists (Cidral et al, 2020).

Assessment of e-learning perception, level of satisfaction and adaptation in global scale is extremely important. According to the scientists from Luxembourg, Germany and the Netherlands (Kirsch et al, 2021), the organization of e-learning during the isolation differs both between countries and within them. The cultural characteristics of the educational environment clearly demonstrate the difference in perception and assessment of e-learning. According to Iranian researchers Leili Yekefallah et al. only 20.75 % of medical students were satisfied with such a learning activity. The authors point out the influence of demographic parameters (gender, age, marital status) and experience with e-learning.

According to M. Mahyoob, only 18 % of humanities students from Saudi Arabia had no problems during e-learning, but at the same time, only 42.90 % emphasize their positive perception and 43.20 % support remote learning in case of a crisis only. The number of not satisfied is 13.80 %.

Joint Russian-Vietnamese study (Noskova et al, 2021) analyzes the risks of distance education based on the experience of the COVID-19 pandemic in terms of the emotional, cognitive and behavioral attitudes of non-technical universities students in Russia and Vietnam. The authors confirm a significant similarity in the assessments of students from these two countries. This is the preference for face-to-face education. However, discrepancies in the perception of digital university environment from the point of view of education system national specifics and traditions, state policy and the mobilization potential of the country's population were also revealed. 52 % of Vietnamese and 41 % of Russian students have undesirable satisfaction. 20 % of Russian students and 10.7 % of Vietnamese see no positive effects of e-learning. But Russian students say about lack of communication with their groupmates and Professors and Vietnamese are not satisfied the quality of education because they are sure that it will have negative effects in their professional activity. The students from the both countries point out that e-learning is associated with independent work and motivation, the search for the necessary information (70 % of
Russian and 60 % of Vietnamese students). But the students of the both universities note the difficulties with self-organization.

The work by G.Yu. Ikonnikova, N.B. Lisovskaya, E.S. Tuzhikova provides data that 69.4 % of Russian pedagogical university’s students (bachelors and specialists), using the Moodle platform, expressed the opinion that remote learning reduced the quality of education. According to N.I. Dunaeva, P.A. Egorova online lectures are inconvenient for 36.4 % of Russian classical university’s students.

4. Methods

To obtain the data we used the questionnaire and a descriptive approach for open-ended and close-ended questions analysis, semantic method for assessing the language content obtained empirically, the quantitative-descriptive method for presenting the research results.

The processing and systematization of statistical data obtained from the results of the survey was carried out in the widely used Excel application, which is a part of the Microsoft Office package.

In the calculations, infinite fractions were rounded to hundredths, that is, to two decimal places.

5. Empirical base of the research

The results of the study were obtained on the basis of the questionnaire. All post graduate research students (1st year) of Transport University (Russia, Rostov-on-Don) were involved to analyze their reactions to the questions about post-extreme e-learning (remote e-learning) at the University in October 2020 to January 2021. The final time of the measurement was June 2021. It was the end of 2nd term of full-time study. The responses-reactions on post-extreme e-learning were collected from this focus-group. Some students had already had extreme e-learning experience in Master school (March 2020-June 2020) or during the period of study for Diploma of Specialist (the same period) by the date of the measurement. All of the students had post-extreme experience (October 2020-January 2021) in Post-Graduate School and face-to-face experience in the Universities before the COVID-19 pandemic. The authors developed the questionnaire consisting of 3 blocks with open-ended and closed-ended questions with pre-defined responses only (YES/ NO/ PARTIALLY/). The reactions “PARTIALLY” and “ANOTHER” were examined in details.

The structure of the questionnaire consisted of 3 blocks:
1) Reaction of post graduate research students to remote e-learning during post extreme period (Q 1.1 - 1.3);
2) What are the risks of e-learning in digital educational environment? (Q 2.1-2.4);
3) Potential learning model for post graduate students (Q 3.1-3.2).

6. Characteristics of the respondents

All 33 post graduate students (1st year) took part in the survey (mean is 100 %). Among them 26 students (78.79 %) are the students of Engineering Field, 6 IT students (18.18 %) and 1 Social Science and Humanities student (3.03 %). Since the objectives of the study were to evaluate adaptation of post graduate students of various areas to new educational realities, gender and age indicators were not calculated in detail. Data on these parameters were given selectively. The markers were introduced to differ the respondents: “T” respondents are the students on Engineering Field, “IT” respondents are Information Technologies students, “SH” respondent is 1 Social Science and Humanities student. Here is the profile of the respondents with their demographic characteristics (age, gender) in Table 1.

| № | Respondents  | Age range (frequency) | Total | Gender (frequency) |
|---|-------------|----------------------|-------|-------------------|
|   |             | 23-24 | 25-30 | 31-40 | 41-48 |          | Male | Female |
| 1. | “T” respondents | 11    | 4     | 7     | 4     | 26     | 16   | 10   |
| 2. | “IT” respondents | 1     | 4     | 1     | -     | 6      | 5    | 1    |
| 3. | “SH” respondent | -     | 1     | -     | -     | 1      | 0    | 1    |
The age scale of 4 segments was developed, since the students’ cohort was not heterogeneous.

Segment 1 is 23-24-year-old post graduate students who have already been familiar with extreme-e-learning, since they graduated from the Universities during the lockdown period and before entering Post-Graduate School. They have had electronic competencies in a digital learning environment.

Segment 2 is 25-30-year old post graduate students. It is a rather flexible group in terms of mastering e-competencies due to their recent graduation from the University.

Segment 3 is 31-40-year-old post graduate students. They graduated from the university 5-15 years ago, they are associated not with educational technologies, but with the practical application of knowledge and having experience in transport industry.

And at last, 40-48-year-old students. They graduated from the university long time ago, the connection with educational technologies can be maintained indirectly - through the younger generation (own children).

According to the profile of our respondents we can present age range diagram (Fig. 1) according to specializations. Average age of the students is 29.3 years old.

![Fig. 1. Age scale of “T”, “IT” and “SH” respondents](image)

7. Results and Discussions

7.1. Reaction of post graduate research students to remote e-learning during post extreme period.

The reactions on 3 questions from block 1 were analyzed. Response-reactions on the questions about e-learning on the base of the students’ perception are shown on Fig. 2, 3, 4.

Q1.1. Was the transition to remote e-learning advisable in October 2020?

From the total number of the students (33 students) 30 students (90.91 %) expressed positive reaction to advisability of remote e-learning (“T” respondents and “IT” respondents). 100 % “IT” respondents had the same positive reaction. This diagram demonstrates only polar reactions.
The age scale of 4 segments was developed, since the students’ cohort was not heterogeneous. Segment 1 is 23-24-year-old post graduate students who have already been familiar with extreme e-learning, since they graduated from the Universities during the lockdown period and before entering Post-Graduate School. They have had electronic competencies in a digital learning environment.

Segment 2 is 25-30-year old post graduate students. It is a rather flexible group in terms of mastering e-competencies due to their recent graduation from the University.

Segment 3 is 31-40-year-old post graduate students. They graduated from the university 5-15 years ago, they are associated not with educational technologies, but with the practical application of knowledge and having experience in transport industry.

And at last, 40-48-year-old students. They graduated from the university long time ago, the connection with educational technologies can be maintained indirectly—through the younger generation (own children).

According to the profile of our respondents we can present age range diagram (Fig. 1) according to specializations. Average age of the students is 29.3 years old.

**Fig. 1. Age scale of “T”, “IT” and “SH” respondents**

### 7. Results and Discussions

#### 7.1. Reaction of post graduate research students to remote e-learning during post extreme period.

The reactions on 3 questions from block 1 were analyzed. Response-reactions on the questions about e-learning on the base of the students’ perception are shown on Fig. 2, 3, 4.

**Q1.1. Was the transition to remote e-learning advisable in October 2020?**

From the total number of the students (33 students) 30 students (90.91%) expressed positive reaction to advisability of remote e-learning (“T” respondents and “IT” respondents). 100% “IT” respondents had the same positive reaction. This diagram demonstrates only polar reactions.

**Fig. 2. Range Reactions of “T”, “IT” and “SH” respondents to advisability of remote e-learning.**

**Q1.2. Was the organization of remote e-learning in October 2020-January 2021 comfort?**

All 33 respondents (100%) expressed positive reaction to comfortable organization of remote e-learning activity in digital educational environment.

**Fig. 3. Reactions of “T”, “IT” and “SH” respondents to comfortable organization of remote e-learning activity in digital educational environment.**

**Q1.3. Is it possible long-oriented and permanent organization of remote e-learning in digital educational environment?**

33.33% from all the students including “T” (9 persons) and “IT” (2 persons) respondents were satisfied with organization of long-oriented and permanent remote e-learning. 60.61% from all respondents (16 “T” and 4 “IT”) chose variant “another”. Decoding of this response demonstrated the content “in the case of dramatical situation”, “if it is necessary”.

**Fig. 4. Reactions of “T”, “IT” and “SH” respondents to long-oriented and permanent organization of remote e-learning in digital educational environment.**
Fig. 4. Reactions of “T”, “IT” and “SH” respondents to long-oriented and permanent organization of remote e-learning in digital educational environment.

7.2. What are the risks of e-learning in digital educational environment?

The reactions on 4 questions from block 2 were analyzed. Response-reactions on the questions about the risks of e-learning in digital educational environment were shown on Fig. 5, Table 2, Fig. 6.

Q2.1. Did all the Professors have e-learning competences?
100 % of PhD students were satisfied with the Professors’ e-learning competences and expressed positive reaction.

Q2.2. What learning methods were effective?
Assessment of the learning methods (Explanation, Explanation with Discussion, all methods) showed a priority of Explanation with Discussion. It was demonstrated by “T” (33.33 %) and “SH” (3.03 %) respondents. “T” and “IT” respondents (18.18 %) had the similar responses. They were fully satisfied with Explanation. “T” respondents (27.27 %) enjoyed all the methods.

Fig. 5. Assessment of the learning methods by “T”, “IT” and “SH” respondents.
Q2.3 Did you have any technical risks (poor Internet communication, technical support, lack of e-competencies or devices)?
Q2.4 Did you have any social risks (problems with self-organization, home instability, lack of communication with groupmates and Professors)?

Response-reactions to Q2.3 and Q2.4 are in Table 2 and Fig. 6.

| No | Reactions                          | Risks | technical | social |
|----|-----------------------------------|-------|-----------|--------|
| 1. | “Т” respondents (YES)             | 6     |           | 19     |
| 2. | “IT” respondents (YES)            |       | 1         |        |
| 3. | “SH” respondent (YES)             | 1     | 1         |        |
| 4. | “Т” respondents (NO)              | 20    | 7         |        |
| 5. | “IT” respondents (NO)             | 6     | 5         |        |
| 6. | “SH” respondent (NO)              |       |           |        |

Here (Fig. 6) one can see that social risks prevailed over technical risks for “Т” respondents. “IT” respondents didn’t associate e-learning with technical risks. “SH” respondents have both technical and social risks.

7.3. Potential learning model for Transportation Professionals (post graduate students)

The response-reactions to potential learning model (Q 3.1 – 3.2) for the students were analyzed. These reactions are shown on Table 3.

Q3.1. What format of learning is more suitable for you as a post graduate research student?
1 reaction – Face-to-face only; 2 reaction – Remote e-learning only; 3 reaction – Another.
Q3.2. Would you like remote e-learning returning?

Table 3. The reactions of “T”, “IT” and “SH” respondents to the question dealing with the potential learning model.

| №   | Reactions                  | Type of learning         | Would you like remote e-learning returning? |
|-----|----------------------------|--------------------------|---------------------------------------------|
| 1.  | “T” respondents (YES)      | 27.27%                   | 36.36%                                      |
| 2.  | “T” respondents (NO)       | 30.30%                   | 9.09%                                       |
| 3.  | “T” respondents (ANOTHER)  | 21.21%                   | 33.33%                                      |
| 4.  | “IT” respondents (YES)     | -                        | 12.12%                                      |
| 5.  | “IT” respondents (NO)      | 3.03%                    | -                                           |
| 6.  | “IT” respondents (ANOTHER) | 15.15%                   | 6.06%                                       |
| 7.  | “SH” respondent (YES)      | 3.03%                    | -                                           |
| 8.  | “SH” respondent (NO)       | -                        | 3.03%                                       |
| 9.  | “SH” respondent (ANOTHER)  | -                        | -                                           |

Table 3 demonstrates great potential of full remote e-learning for creation new educational model due to ability to study in remote e-learning format. Decoding reaction “Another” does not give negative satisfaction with remote e-learning. Respondents chose that variant to illustrate content “when it is necessary”.

8. Conclusion

Our hypothesis was confirmed partially. Not all the students have stable e-competencies, despite 100 % positive reactions to the digital learning environment (stable e-learning competencies of the Professors and the comfort transition to post-extreme remote e-learning). A stable systemic negative reaction to remote e-learning was noted by “SH” respondent (female, 25 years old). “IT” respondents showed a relatively similar adaptation to new educational realities.

Face-to-face format of learning was preferable for 30.30 % of all the post graduate students (27.27 % “T” and 3.03 % “SH” respondents). Remote e-learning only was satisfied for 39.39 % of the students (33.33 % “T” and 6.06 % “IT” respondents).

At that time desire to keep such e-learning experience was coded in positive reaction to the question “Would you like remote e-learning returning?”. 48.48 % of all 1st year students (transport professionals) (36.36 % “T” and 12.12 % “IT” respondents) were ready for e-learning format of training because it would save time for research activity.

39.39 % of the students (33.33 % “T” and 6.06 % “IT” respondents) except 1 “SH” respondent (3.03 %) were ready to that remote e-learning activity “when it is necessary” or in the case of dangerous epidemiological situation. E-learning risks were mainly associated with social adaptation in the digital learning environment.

Assessment of post-extreme e-learning will help to create a new hybrid model research students training activity. Such a combined activity leaves enough room for the individual development of the students. It may help to professional and research socialization as opposed to post graduate students’ socialization in the university community.

References

Al-Fraihat, D. et al, 2019. Evaluating E-learning Systems Success: An Empirical Study. Computers in Human Behavior 102. 10.1016/j.chb.2019.08.004.

Baeva, L., Khrapov, S., Azhmukhamedov, I., Grigorev, A., 2020. Digital turn in Russian education: from problems to possibilities. Values and meanings 5(69), 28-44. DOI: 10.24411/2071-6427-2020.

Cherkasova, L., 2021. The paradigm shift in intercultural communication in digital space. E3S Web of Conferences 273, 11018. https://doi.org/10.1051/e3sconf/202127311018
References

Cherkasova, M., Taktarov, A., 2021. Negative impact of digital freedoms on Russian youth. E3S Web of Conferences 273, 10015. https://doi.org/10.1051/e3sconf/202127310015.

Cidral, W., Aparicio, M., Oliveira, T., 2020. Students’ long-term orientation role in e-learning success: A Brazilian study. Heliyon 6(12). doi:10.1016/j.heliyon.2020.e05735.

Dunaeva, N.I., Egorova, P.A., 2021. Individual resistance to difficulties during distance learning. Vestnik of Minin University 9(2), 8. DOI: 10.26795/2307-1281-2021-9-2-8.

Ikonnikova, G.Yu., Lisovskaya, N.B., Tuzhikova, E.S., 2020. Digitalization in modern education (case study of Herzen State Pedagogical University of Russia. Psychology in Education 2(2), 150-156. DOI: 10.33910/26869527-2020-2-2-150-156.

Isaeva, T.E., 2021. Higher School Teacher’s Competences and “Electronic” Pedagogical Culture in the Post-Pandemic World. Higher Education in Russia 30(6), 80-96. doi: 10.31992/0869-3617-2021-30-6-80-96.

Khusyainov, T.M., 2014. History of the Development and Expansion of Distance Education. Pedagogy and education. Pedagogy and education 4, 30-41. DOI: 10.7256/2454-0676.2014.4.14288.

Kirsch, C., Pascale, M.J., Engel de Abreu, Neumann, S., Wealer, C., 2021. Practices and experiences of distant education during the COVID-19 pandemic: The perspectives of six- to sixteen-year-olds from three high-income countries. International Journal of Educational Research Open 2(2). https://doi.org/10.1016/j.ijedro.2021.100049.

Kryukova, A., 2019. Providing distance learning in graduate school: legal aspects of the organization of full-text information resources. DOI: 10.24411/2310-1679-2019-10203.

Kümmel, E., Moskaliuk, J., Cress, U., Kinnermele J., 2020. Digital Learning Environments in Higher Education: A Literature Review of the Role of Individual vs. Social Settings for Measuring Learning Outcomes. Educ Sci. 10(3), 78. doi: 10.3390/educsci10030078.

Mahyoob, M., 2020. Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners. Arab World English Journal 11(4), 351-362. DOI: https://dx.doi.org/10.24093/awej/vol11no4.23.

Martynov, V.G., Koshelev, V.N., Dushin, A.V., 2020. Modern Challenges for Oil and Gas Education. Higher Education in Russia 29(12), 9-20. doi: https://doi.org/10.31992/0869-3617-2020-29-12-9-20.

Mikhailov, O.V., Denisova, Ya.V., 2020. Distance Learning at Russian Universities: “Step Forward, Two Steps Back”? Higher Education in Russia 29(10), 65-76. DOI: https://doi.org/10.31992/0869-3617-2020-29-10-65-76.

Murzina, I., 2020. Humanitarian resistance in the context of digitalisation of education. The Education and Science Journal 22(10), 90–115. DOI: 10.17853/1994-5639-2020-10-90-115.

Noskova, A.V., Goloukhova, D.V., Proskurina, A.S., Nguyen, T.H., 2021. Digitalization of the Educational Environment: Risk Assessment of Distance Education by Russian and Vietnamese Students. Higher Education in Russia 30(1), 156-167. doi: 10.31992/0869-3617-2021-30-1-156-167.

Senashenko, V.S., 2020. Features of Postgraduate Programs’ Reforming as an Issue for Scientific and Pedagogical Discussion. Higher Education in Russia 29(3), 58-73. DOI: https://doi.org/10.31992/0869-3617-2020-29-3-58-73.

Sklarova, T.V., Malysh, V.S., 2021. The Specifics of Training Highly Qualified Person-nel in Postgraduate Studies Using Information and Communication Technologies in Russia and Abroad. RUDN Journal of Psychology and Pedagogics 18(1), 153–173. http://dx.doi.org/10.22363/2313-1683-2021-18-1-153-173.

Solovov, A.V., Menshikova, A.A., 2021. Coronavirus Zigzags of Electronic Distance Learning. Higher Education in Russia 30(6), 60-69. doi: 10.31992/0869-3617-2021-30-6-60-69.

Terentev, E.A., Bedny, B.I., 2020. Problems and Prospects for the Development of Doctoral Education in Russia: The View of Regional Universities. Higher Education in Russia 29(10), 9-28. DOI: https://doi.org/10.31992/0869-3617-2020-29-10-9-28.

Vezirov, T.G., Kostina, E.A., 2016. Educational web-technologies in training bachelors and masters of pedagogical education. Novosibirsk State Pedagogical University Bulletin 6(4), 39–49. doi: http://dx.doi.org/10.15293/2226-3365.1604.04.

Yekefallah, L., Namdar, P., Panahi, R., Dehghankar, L., 2021. Factors related to students’ satisfaction with holding e-learning during the Covid-19 pandemic based on the dimensions of e-learning. Heliyon, 7. DOI:https://doi.org/10.1016/j.heliyon.2021.e07628.

Table 3. The reactions of “T”, “IT” and “SH” respondents to the question dealing with the potential learning model.