Article

Digital Communication Tools and Knowledge Creation Processes for Enriched Intellectual Outcome—Experience of Short-Term E-Learning Courses during Pandemic

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Abstract: Social isolation during the pandemic contributed to the transition of educational processes to e-learning. A short-term e-marketing education program for a variety of students was introduced in May 2020 and is taught entirely online. A survey was conducted regularly in the last week of training using Google Forms, and three cohorts were surveyed in July, September, and December 2020. A high level of satisfaction indicates an interest in the content and a positive assessment of the level of comfort of an organization adapted to the needs of students; this positive result contrasted with the negative opinion of the remote learning in Russia since March 2020, and this surprising satisfaction of students has motivated the study to try to explain its reasons. This result was compared with the short-term course taught through the educational pedagogical platform of a university. The students of traditional short- and long-term university programs were asked to assess their satisfaction with different digital communication tools used for e-learning. They showed low satisfaction with the pedagogical platform and a positive reaction to the e-communication tools (messengers, social media, short surveys, video conferences, etc.). The qualitative responses helped to better understand the real problems of the cognitive process and the triple structure of intellectual production during e-learning, including interest in the intellectual outcome, the need for emotional and motivational elements of cooperation and competition between students, and smooth behavioral enrichment, which requires special efforts from students and their leading from teachers. The main conclusion concerns a practical decision to continue the implementation of the educational program in the form of an online course with the use of the mixed digital communication tools of social media, messengers, and video conferences, which most likely meets the expectations and capabilities of students.

Keywords: e-learning; digital communication; knowledge transfer; short-term education; value creation; intellectual outcome

1. Introduction

Learning is a social cognitive process that requires both content on the main subject of studies and organization of the exchange and assimilation process. The content reflects a logical representation of reality in the mind and can take verbal, visual, and sound forms; it can be accessed via the Internet or can exist in the form of printed books and materials

available in libraries, universities, schools, etc. Communication with others plays the role of the organization process to assimilate the content and master its implementation to assure that the exchange of experience and transfer of knowledge can be carried out in physical or virtual space in the form of live interaction, joint practical activities, or access to prepared materials.

The University 4.0 approach [1] includes an integrated vision of the educational environment for humanitarian, social, and engineering learning within the global economy of knowledge [2]; social interaction helps the humanitarian understanding of positioning technical knowledge to achieve holistic, successful results as professional competencies [3] and improve students' skills [4–6]. To build e-pedagogy requires special conditions that include physical infrastructure (equipment, access to the Internet) and acquired skills [7], and both are necessary for an effective e-learning process; the organization of digital education requires teachers and students to use digital tools to communicate [8]. These investments take resources, and the actors (administrators, teachers, and students) are sensitive to the approximate return (knowledge gained) on invested time, effort, and finance.

E-learning tools are plentiful; the COVID-19 pandemic and quarantine have demonstrated a wide variety of digital tools and poor proficiency in these tools by teachers and students [9,10]. While digital natives have a lot of experience and have the habit to use mobile devices, teachers are more focused on using stationary equipment, and not all of them were prepared for the needs of the pandemic, which provoked several difficulties such as the lack of traffic and equipment. The increase in Internet traffic was associated with the remote activities of all family members in one household: distance learning for children, remote work of parents and grandparents, and games and leisure activities via the Internet for all apartment residents as an exceptional pastime during social isolation. The insufficient volume and flexible schedule of Internet access require a high level of autonomous work of students and adaptive involvement of teachers.

The COVID-19 pandemic has disrupted the normal educational process for long-term programs such as bachelor's and master's degrees and has opened up new opportunities for short-term studies offered by flexible private institutions as well as educational giants such as universities, and for their co-operation. The experience of implementing such a program in three periods (May–July, July–September, and October–December 2020) led to a conclusion about the effectiveness of the introduction of mixed tools for reconfiguring the educational process.

This reconfiguration touched upon humanitarian, social, and technical aspects that are discussed by scholars:

- The humanitarian dimension is based on the involvement of unbiased teachers and the formation of homogeneous groups of students with various backgrounds (different pasts) but similar interests and levels of motivation to learn (cognate perception of future) [11];
- Social integration is ensured through messengers, social networks, and platforms for video conferencing, meetings, and communication—these three components encompass social integration through a special community of learners and their specific semantics [12], the construction of cultural codes [13,14] and social hierarchy between them in the virtual space [15], as well as options to see and be seen on video conferences as a way of self-presentation and social control as well as social recognition of the ontological existence of others [16,17];
- Pedagogical platforms, as well as social media, play the role of libraries in which materials and textbooks are presented, providing storage of external and formalized knowledge; neuron communications represent the potential for further development of technologies for access to open knowledge [18–20].

This network of pedagogy with digital tools of communication and intellectual exchange [21–23] covers the main areas of the cognitive, affective, and conative communication structure [24–26] for the production of knowledge. The combination of pedagogical elements with a triple knowledge-creation structure and blended digital tools allows re-

searchers to form a structured digital learning grid for the observed case of a short-term practice-oriented course as a concrete example of an educational value chain in the field of e-learning during a particular pandemic [27].

The combination of these approaches and tools with the openness and availability of teachers, their willingness to find answers to specific questions of students, and the ability to exchange intellectual results between students and receive immediate feedback from teachers using digital communication tools [28] allowed us to obtain the positive final impression of the students. Students' satisfaction is evidence of the quality of the educational product [29], and 100% in three cohorts (in July, September, and December 2020) responded in the survey that they strongly recommend the course to their friends; to compare, the students of the traditional university short-term course answered slightly differently, i.e., 76.1% answered "yes, I strongly recommend", but 23.9% answer no (November 2020). This unexpectedly high, positive result, in fact, raises the question of its reasons.

The discrepancy between the negative perception of the transition of traditional education towards the online mode—and the stable positive reaction of the students of the analyzed program (contradiction between the expected mediocre assessment and the actual positive result obtained)—forced researchers to try to find an explanation. This attempt is implemented in the exploratory study presented in this paper.

The hypothesis of the research is that the satisfaction of students depends on the balanced division of efforts of learning. This balanced approach included (i) the harmonized distribution of roles between the people involved in teaching (to teach theory, to motivate and integrate students, and to demonstrate and explain practical skills and procedures); (ii) the amount of cognitive/affective/conative knowledge acquired, and (iii) the balance between resources (time and intellectual effort) spent to learn the core material and to master the additional tools of e-learning. The first two elements of the hypothesis represent the process of knowledge creation, because the roles of teachers reflect the rational, emotional, and behavioral elements of the knowledge assimilating process, and the intellectual outcome includes cognitive, affective, and conative content of the knowledge acquired. The presented research investigates the e-learning process with the quantitative method and includes a qualitative analysis (answering open-ended questions) of the content as the intellectual outcome.

These three elements of the hypothesis include:

- H1—The flexible organization of the short-term educational program allowed the course's authors to construct the schedule based on the distinction of three roles that correspond to the responsibilities of three persons—the task of teaching relies on a teacher, the task of motivating is assigned to an entrepreneur (and teacher), and the task of practical skills training is fulfilled by the practicing professional. The involvement of all kinds of actors (professors, practical specialists, and trainers) is necessary (and, today, is already typical in traditional universities) but not sufficient, and the clear division of labor according to the functions clearly assigned increases the satisfaction of students who need to be informed, motivated, and trained, within the specific e-learning context;
- H2—The three kinds of personal duties correspond to the three elements of the intellectual outcome which, within the educational process, are fulfilled by people who are more experienced in the field activities: intellectual research and studying of rational aspects of knowledge (cognitive element of learning), emotional involvement and social integration (affective component), and behavioral apprehension (conative component; for some disciplines, it corresponds to psychomotor skills mastering);
- H3—The simpler the assimilating process of additional "extra" knowledge (skill to learn through diverse educational tools), the better the result of the intellectual outcome to assimilate the "essential" core knowledge of the course (the subject of the discipline). Traditional university long-term studying is constructed on the consequence of steps: the initial assimilating of specific educational tools (such as specialized educational platforms; in Russian universities, it is usually Moodle) is required to

access the materials of the disciplines. Short-term programs can be built on the basis of the use of "ordinary" wide-spread digital tools of communication, such as social media, messengers, and video conference (or streaming) services (such as Zoom, Discord, Hangouts, etc.). The comparison between traditional long-term university courses and short-term programs demonstrate that long-term studying is a more complex process, the students are socially integrated at the institution, and knowledge acquired is worthy to assimilate the additional skill of the educational platform use. The short-term program has no extra time nor extra motivation of students in terms of assimilating the specific skills of the use of specialized digital communicative instruments.

The three groups of students provided an assessment of the organization of e-learning and several recommendations for improving the content and presentation to better meet the requirements and expectations of the students. The article presents an analysis of the research results and accumulated reviews, comments, and specific preferences of students, which are compared with the assessments of a short-term learning course provided through a traditional format (pedagogical platform) and with the students' satisfaction with the digital communication tools used for long-term university programs.

The purpose of the article is to discuss the constructed instrumental grid of pedagogical methods, digital tools, and the personal participation of teachers with various competencies. This grid is perceived as a fundamental competitive advantage for organizing knowledge production as an intellectual result of the educational process.

2. Materials and Methods

The purpose of the study was clearly pragmatic: an educational institution must make a decision on the implementation of a program every time a previous course ends and students receive a diploma. The study was carried out to assess the previous course and find solutions and options for improving the course to better tailor it to customer expectations and preferences.

Remote learning for short-term (3 months long) educational programs was emergently constructed with the use of an e-learning approach, whereby institutions were forced to transform face-to-face studying towards remote education based the on the implementation of digital communication tools. The experience allowed researchers to discover that this "crafted" set is efficient due to the triple conjugation of (i) digital communication tools, (ii) processes of learning (combination of cognitive, affective, and conative aspects), and (iii) competencies and involvement of teachers (professor, professional, and entrepreneur).

The first three generations of students of the program highly appreciated the content and the organization of the learning process, and several adjustments between the first and second implementations were made only in the content of the theoretical part, which was previously focused on manufacturing enterprises and was redirected to the service sector. This slight difference concerned the examples and cases used, but the textbook materials were not changed.

All elements of e-learning practice, digital tools, and platforms used remained the same for all cohorts, as well as the division of labor between the three categories of teachers. The course content was planned and prepared jointly by a professor at Peter the Great St. Petersburg Polytechnic University, who also teaches at the Herzen State Pedagogical University of Russia, the St. Petersburg Electrotechnical University "LETI", and at international programs of the St. Petersburg State University of Economics including the Italian program with La Sapienza University (Roma); this wide background explains the level of the course's adaptation to different categories of students with diverse initial education fields (economic, technical, humanitarian, etc.) and various levels of skills (certified and not certified, graduated students and not graduated).

The social integration and organization of students was fulfilled by an entrepreneur who is also involved in university education.

The practical skills were given by an experienced practicing professional who had no previous teaching experience, but she has mastered the newest tools of the core discipline.

The team decided to reject the "traditional" pedagogical platform (Moodle) which is compulsory at Russian universities. The first results demonstrated that this decision was efficient due to this triple grid of roles with clear distinction of functions, three-component activities, and inhabited digital communication tools used for learning.

A private educational institution promoted the program, but students received a standard state format of diploma, which means that the diploma and the learning organization had to be conforming to the state requirements. This partly explains the traditional structure of combined theoretical and practical course elements required by state educational standards and norms for the delivered types of diplomas. The course was free for most students through state financial support, including funding from the federal and regional budgets, but several students paid for this educational course (from 3 to 6 persons). The state format of the issued diploma determines compliance with legal and regulatory requirements and compliance with the ethical standards of teaching at a university.

Three groups of e-learners included people interested in the subject of the course (e-marketing and promotion) and willing to spend 3 months on online learning (3 weeks of theoretical lectures and 2 months of practical work on students' own projects under the teachers' control). About half of the students of the first cohort and more than 2/3 of the participants in the second and third generations of the program came to the program with their own ideas for future online businesses in order to develop them on the educational program.

This practical interest explains the very high level of student commitment and involvement in all types of educational activities, in social activity when communicating using instant messengers and social networks, as well as the motivation to accomplish all learning activities and complete all homework, including a high level of prepared final work, which represent the stages of development of student e-business projects. These characteristics of student groups allow the researchers to rely on the positive grades given by students, to evaluate a high level of reliability in the research results, and to improve the following training courses thanks to the experience gained by the teachers, as well as the grades and recommendations provided by the students.

The survey was carried out anonymously. The sample (N1 = 46, N2 = 31, and N3 = 34) included men and women, but women constituted the majority (97.3%) in the cohorts (only 2 men in the first generation and 1 man in the second; only women in the third group), aged from 22 to 47 years old; average age—37 years (standard deviation, SD = 4825). The gender distribution corresponds to the general population of similar faculties of the St. Petersburg universities calculated on the basis of internal documents on the enrolment in September 2020 and September 2019 (e.g., only girls in the 3rd and 4th years of a similar Bachelor's program at the Herzen University; 2 boys in 2nd year, 3 boys in 1st year; the total represents 5 men from 131 students, women represent 96.2%).

The survey methodic tools and questionnaires were used to evaluate the satisfaction of the participants of a short-term program (one month long) organized according to the whole official University program on the pedagogical platform of the LETI University, in a similar subject (innovation project management), organized in the remote regime of an online course in November 2020. The sample (N4 = 67) had a similar structure: people aged from 32 to 51 years old; average age—41 years (standard deviation, SD = 3907). Of them, 53.7% were women, and 46.3% men; the structure of this group was influenced by the municipality financing the program: they required the gender of the sample to be more balanced. To eliminate the influence of gender, the calculations of the results given only by women were taken into account, and the cross-analysis demonstrated that men assess the factors with similar levels but some factors with lower frequency. The influence of gender was not statistically significant for the grades given, and the correlation was calculated of the assessments' level of all elements and gender (−0.027), which reflects an absence of statistical significance of the influence of the gender factor.

The results obtained were compared with a short survey of satisfaction of the use of digital education tools carried out in September 2020 (at the beginning of the academic

year) among the "ordinary" universities' students of Bachelor's (4 years) and Master's (2 years) degrees; the survey was initiated at all 4 above-mentioned universities.

The sample of traditional university learners (Nt = 203) was not representative for the whole university cohorts because all respondents were studying at faculties of social and economic courses related to the topics of the programs investigated (marketing and management); even at the technical universities (Polytechnic and Electrotechnical ones), the choice was determined by the personal contact of the professor with the groups of students and the survey concerned only the students attending courses given by the researchers (see Table 1).

Table 1. Points awarded by students on the elements of the organization of the educational process, September 2020.

Element of Learning Process	Bachelor	Master	Total
Peter the Great St. Petersburg Polytechnic University	91	17	108
Herzen State Pedagogical University of Russia	57	5	62
St. Petersburg Electrotechnical University "LETI"	11	3	14
St. Petersburg State University of Economics [1]	17	2	19
Total	176	27	203

[1] Only students at English- and French-speaking international programs.

The sample included 176 Bachelors students and 27 Masters students. All respondents attended a course similar to the "e-marketing and promotion" topics (e-communication, e-media, innovation management, digital economy, online reputation and brand management, etc.), and we suppose that they are involved in the field of digital economy and are aware of e-communication issues and instruments of e-marketing. They probably have a higher level of awareness of digital tools of communication than students of traditional faculties (such chemists, physicians, and art and humanities specialists, even if they had chosen these faculties at the technical universities), but a lower level than students have at technical or IT programs of university education.

This sample was much more homogenous by age due to the "normal" path of Bachelors students who enroll at universities at the age of 18–19 years (students in the 3rd and 4th years of Bachelor's degrees were surveyed) and continue to the Master studies at the age of 22–24 years (the average age of the sample was 22 years, SD = 1.323).

3. Results

The results obtained include a quantitative and qualitative assessment of the social and pedagogical elements of the short-education program; the quantitave evaluation is compared with a quantitative assessment of the digital education tools given by the students of the long-term traditional university programs.

3.1. Assessment of the Course Training at the Short-Term Program

The organization of the short-term educational process was assessed by student satisfaction scores. The questionnaire for short-term program students included simple questions such as "Please rate the characteristics of the course" or "What is your impression?", "What was valuable to you?", and "What should we improve?" The concise formulation avoided heavy discussions during the assessment and allowed more spontaneous and impulsive assessments and opinions to be obtained. The elements of the organization of the educational process were assessed at a high level; the scores "bad"–"excellent" represent the traditional Russian rating scale from one to five points, and the category "better than excellent (beyond expectations)" is included in the calculations with six points.

This section presents the results obtained on the samples N1, N2, N3 (the analyzed program), and N4 (the short-term program with the use of the traditional university pedagogical platform).

3.1.1. Points for Organizational Elements

The high level of the assessment given by the first cohort (see Table A1 in Appendix A) is reflected with the scores that shifted the "excellence" mark (five points are the habitual maximum for Russian students): practical workshops, project work, communication with teachers, and relevance and the actual character of the material were evaluated at the grade that was higher than five pts. Only the teamwork depending on the students' self-organization was given a lower score, where the level of satisfaction was near three pts (a low mark in Russian schooling tradition). It should be noted that, firstly, the online format of e-learning makes teamwork more difficult due to the specific organizational efforts and skills required; secondly, the low satisfaction can be less "independent" and related to the comparison with the normal situation of face-to-face circumstances of ordinary learning organization in the classroom.

The results obtained from the first generation (N1 = 46) can be compared with the second cohort assessment (N2 = 31) made in September 2020 (see Table A2) and the third group scores (N3 = 34) made in December 2020 (see Table A3).

The results demonstrate the clear predominance of good and excellent scores given by students regarding the organization of the educational process.

Common opinions were expressed by students about the lectures (SD = 0.435), communication with teachers (0.322), control and examination (0.187), and up-to-date material (0.452); the highest deviation was obtained in the assessment of teamwork (SD = 1.834), and a lower difference was demonstrated in opinions of project work (0.899) and practical workshops (0.774).

The department of innovation management organized, in the autumn semester in 2020, a one-month-long program for similar categories of students (with various backgrounds and different levels of previous education) in the form of e-learning, but in the framework of the traditional university basis of pedagogical configuration with the use of the Moodle platform and testing as an intermediate and final exam. The assessment given by students also reflects the whole satisfaction of the students (N4 = 67) (see Table A4).

The students gave the highest scores to the lectures given in this program, but at the same time, it is only one position which was assessed by all 67 students of the sample. All other positions lacked some people: less people evaluated Team work (21 in total), Interaction among learners (18) and Final paper preparing (18 persons). This difference is related, probably, to the fact that in the first examined program, personalized invitations to fill in the survey were sent to the students of all three cohorts by the teacher who worked with them during the entire period of the program (the content and administration were not separated), and in the University program, the administration of the department sent a similar letter which, apparently, was perceived as a mass impersonal mailing by the receivers, who gave their assessments in a formal way.

Exploratory research has limited confidence, but the correlation between the assessments of the investigated course and the University short-term program differs: the evaluation of lectures is very close (ratio of correlation is near 1: 0.999579), and similar evaluations were given to project work and to control and examination (0.979 and 0.974, respectively) but ratings were low for practical workshops (0.157) and teamwork (0.459), which shows the absence of influence of the mode of lecturing (through video conference or pedagogical platforms) on the satisfaction of students with the lectures, and the potential impact on the practical lessons' efficiency and team organization. Statistically significant results were obtained for Practical workshops (χ^2 = 3.754, significant with p = 0.05) and Interaction with teachers (χ^2 = 8.734, significant with p = 0.05), which means that the indicators of the construction of practical apprehension and knowledge transfer through the communication of learners and teachers are influenced by the choice of pedagogical configuration. The clear division of labor helped to provide high efficiency of the organization of practical skills training based on the coordinated flexible interaction with teachers; as such, the hypothesis H1 can be considered as proven.

3.1.2. Evaluations of Used Digital Instruments by Short-Term Program Students

Digital technology helps students and teachers communicate as they learn. The use of digital tools allowed students to ask questions at any point in their work and included interactions in the form of a Zoom chat during video conferencing, a chat in the student and faculty community on VKontakte social networks, and conversations on WhatsApp messenger, and several students preferred to submit their work or documents and ask for help by email, which was more typical of the first group and was less used by the second cohort (15 out of 46 people sent emails to teachers in June–July; only four students started email correspondence in August–September 2020, and only one person asked to be contacted by email in September 2020 before the learning and during the administration of the third group).

The scores for using digital remote communication tools implemented for e-learning in the program (see Tables A5–A7 in Appendix B) showed overall student satisfaction, but the score for consistency between the instruments was lower than that for the specific instruments themselves (excluding the score for email as a communication tool). Coordination includes differentiated aspects that should be the subject of further research, because the second generation showed a low rise in this element of assessment, despite the concrete efforts that were made by teachers to ensure better (second time) coordination of all online activities and their own availability and participation in all types of interactions.

These results allow us to develop the existing triple system of using social networks, messengers, and video conferencing platforms as a technical grid and theoretical (rational–logical) knowledge combined with emotional involvement and motivational activity (affective aspect) and professional knowledge for behavioral practice as components of an intellectual result—as a structure for knowledge transfer and exchange of experience to improve the e-learning process.

This conclusion is confirmed with the results of the similar assessment given by the students of the university framework (see Table A8). Social media were not used for communication during the course, and messengers were implemented to communicate about administrative issues, e.g., documents were sent through email but several short data and scanned papers were also sent by messengers, partly for the reasons of cyber-security of private, personal data.

Gender was mentioned above as a potential factor influencing the results. In fact, it has an impact on the frequency of the evaluation of two elements: interaction among learners and the use of messengers. Women assessed their satisfaction more frequently than men—15 women and 3 men gave their evaluations of the parameter of inter-student communication, and 29 women and 6 men assessed the use of messengers.

The whole assessment demonstrates higher scores of email as a tool to communicate which was used systematically and similar results for evaluating Zoom, implemented to deliver the lectures. The deep difference in the scores of the coordination of tools can be explained by the lack of a holistic vision and strategy of organization of learning; the content was supplied by the professors of the department, and the administration was partly provided by the department and by the responsible persons at the University for distance learning, for the pedagogical platform Moodle, for the document services, etc. The head of the program was spending time and effort on the internal communication inside the University and delegated the emotional support of students to other people with no responsible persons.

The small samples and exploratory nature of the research do not permit to assure a high level of representativeness of the results of the study. Nevertheless, a clear negative correlation was revealed for the parameter of the Coordination of tools (-0.473); this parameter represents the whole organization of the holistic production of the intellectual outcome through the learning process and demonstrates statistical significance ($\chi^2 = 3.119$, significant with $p = 0.05$). The importance of the digital tools used under the conditions of the pandemic increased, but the lack of coordination reflects the fragmented character of

the traditional organization of education that supports the second hypothesis H2 about the necessity of convergence of the elements of knowledge creation.

3.1.3. Comparison with the Universities' Students' Satisfaction with Digital Education Tools during Pandemic

The traditional university students were asked to assess their satisfaction with the experience of e-learning in March–July 2020 during the pandemic by the list of e-communication and pedagogical tools used during the remote regime of education.

Russian universities implement Moodle as the essential basic pedagogical platform for all kinds of work (materials presentation, control of attendance, testing, etc.).

Professors, by their own initiative, use other tools such as the following:

- Social media (to stock their materials at their personal profile or at a community created especially for each course taught);
- Messengers to quickly contact people and reply to requests and answer questions;
- E-mailing to contact student group leaders and to send them the initial information and web links;
- Video conferencing tools (Zoom, Discord, MS Teams, TrueConf, and Hangouts for small groups of less than 10 persons);
- Testing possibilities existing within MS Teams and Moodle, but also specific tools such as Google Forms or Typeform and Menti for instant answering (which helps to collect current opinions simultaneously with the lecture, its implementation usually aims to involve students more than to control or test their knowledge).

The digital communication tools enumerated in the assessment form were assessed with marks from "bad" (one point) to "excellent" (five points) and "better than excellent (beyond expectations)" (six points) (see Table 2):

Table 2. Points awarded by students for digital tools applied during spring semester, September 2020 (N3 = 203).

Digital Tools Used	Average Points
Social media (VKontakte, Facebook, Instagram, etc.)	3.547
Messengers (Viber, WhatsApp, Telegram, WeChat, etc.)	4.034
Video conferences (Zoom, Discord, TrueConf, Teams, etc.)	3.690
Emails	3.123
Moodle pedagogical platform	1.217
Testing (Google forms, Typeform, etc.)	3.650
MentiMeter (Learning apps, etc., short opinion surveying)	4.389
Coordination between tools	1.995
University's solution for pedagogical configuration	1.315
Occurred combination of tools used by professors	3.532

The obtained results demonstrate the clear preference for the "normal" communication tools used by people in their everyday life (social media and messengers); the habitual tool of sending information and files (email) was assessed only by 36.0% of the sample (73 of 203 people). The specialized platform Moodle imposed by university administrations obtained the lowest score (1.217 pts), and students evaluated the whole coordination of tools at a low level (1.995 pts).

This assessment is illustrated with the next two evaluations of the university model of coping with pandemic requirements related to introducing remote learning, with neither technical infrastructure and equipment nor teachers' competency and students' skills of online education being previously prepared, and to the professors' attempts to manage the situation with the tools they could apply. The university readiness and the capacity to adapt to the new context was evaluated at 1.315 pts (from the interval minimum 1 to maximum 5); the flexibility and adaptability of teaching staff was evaluated at 3.532 pts. The correlation between the involvement of students in a long- or short-term educational

program and the average level of assessment was 0.748, which refers to the high level of statistical significance, even if the samples cannot be recognized as representative.

This analysis supports the supposed (H3) impact of the choice of digital communication tools implemented, of the pedagogical platform, and/or use the messengers and social media as introduced means to transfer information among learners.

3.1.4. Analysis of the Dynamics of the Implemented Technical and Content Elements of E-Learning

Assessment of the dynamics of students' assessments is of interest for improving the content of learning and organization. The survey, in particular, highlighted weaknesses that need to be corrected, such as teachers' supervision of project work. The second generation has shown the best results in teamwork, in part because of the special attention teachers give to help them organize their own self-government and self-regulate the relationships built between students. The third group organized a perfect chat in WhatsApp; they induced themselves powerful mutual emotional support and reciprocal help in carrying out the tasks and practical works of the course.

The diagram illustrates the dynamic of the results related to students' satisfaction with the various elements of the organization of the educational process (see Figure 1); the data from Tables A1–A4 are presented in a form that visualizes the change.

The dynamics of the indicators of the organization of the educational process reflect the growth of student satisfaction, but the sample size and low level of changes do not allow researchers to classify these improvements as statistically significant. Nevertheless, the clear increase in the assessment of the parameter "teamwork" is explained by the rethinking of the role of the teacher in guiding the joint work of students and the clarification of the guidance from teachers in this area: simple registration of autonomous groups of students to carry out project work is not enough—a more flexible and spontaneous regulation of formation and transformation of teams is pertinent, where teachers are involved throughout the decision-making process at the initial stage of team composition and help with advice (not testimony) and recommendations. This management concern was unexpected for teachers because the average age of the students allowed supervisors to rely on their sense of responsibility and their ability to organize themselves, but the actual results demonstrated the need for teachers to enter the field of team building.

The slight decrease in satisfaction with practical exercises and project work can be explained precisely by the period in May–July 2020, when the students themselves were employed to a higher degree due to quarantine measures and social isolation; a period of slowing growth rates of the COVID-19 threat in July–September allowed people to leave home, spend time outdoors, and become more involved in activities other than e-learning. In September–December, people are more involved in the education of their children than their own learning. This observation is partially confirmed by an increase in the assessment of the actual up-to-date nature of the material proposed by teachers at the training (which indicates the high quality of the pedagogical part of the educational process with permanently renewed content) and a clear decrease in satisfaction with the preparation of the final document. In fact, all three of the listed components, which have demonstrated a negative evolution relate to student activities performed by the students themselves: practice, project work, and final work. This dynamic is likely to require additional effort on the part of teachers, as it can occur effectively and increase student satisfaction with collaborative work.

The following diagram shows the slight changes in opinions on the applicability of digital tools implemented to execute e-learning components (see Figure 2); the data from Tables A5–A8 are presented in a form that visualizes the change.
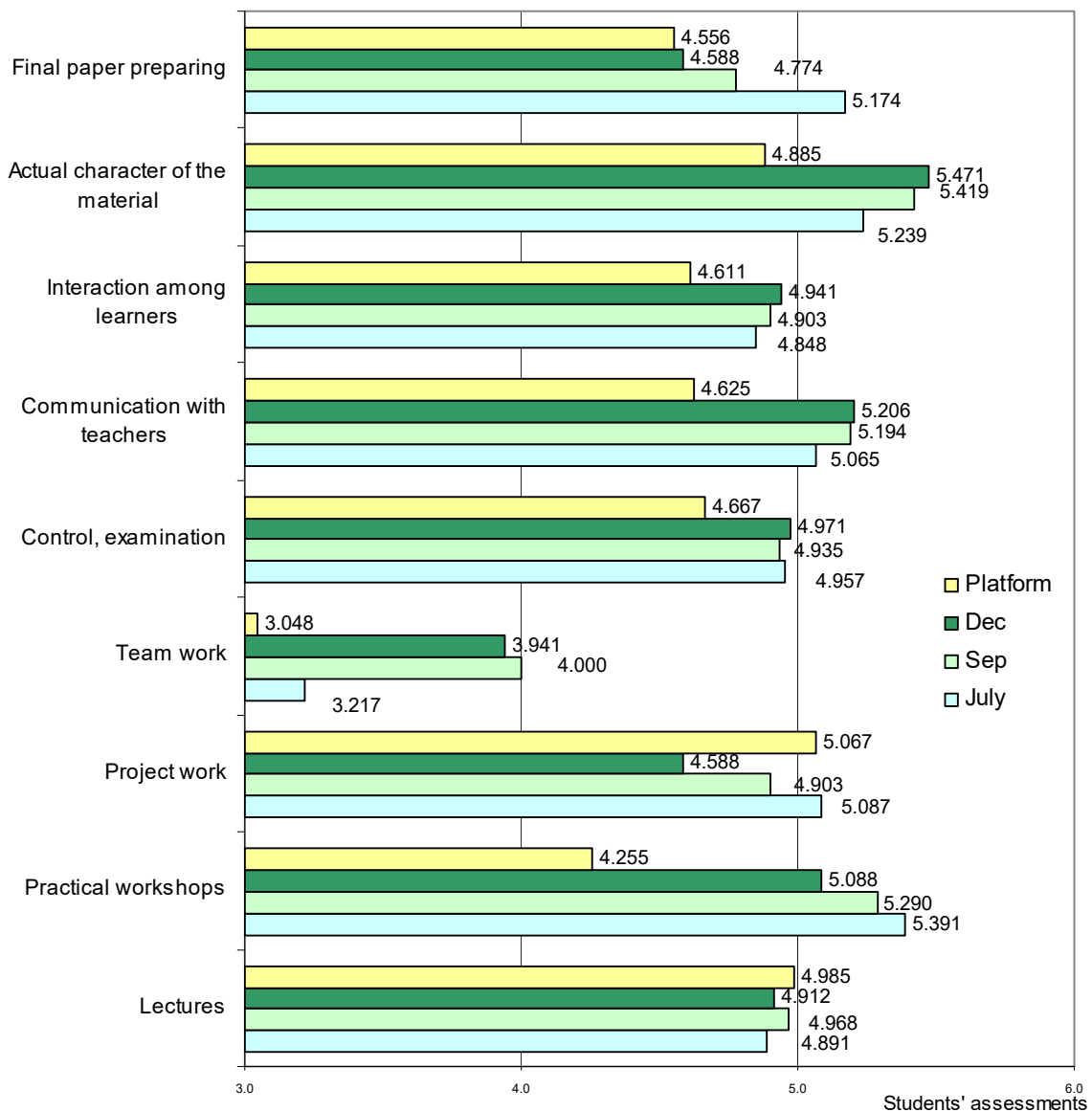
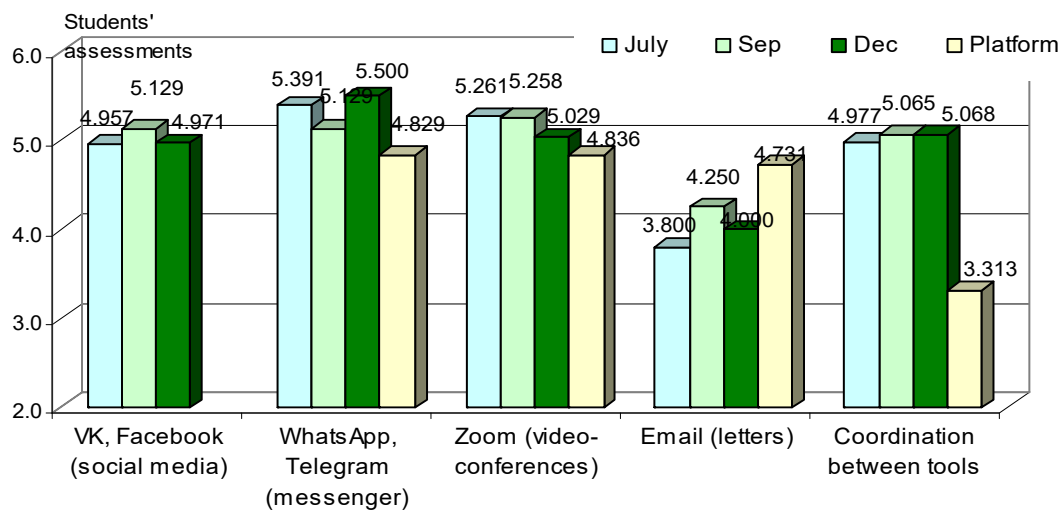**Figure 1.** Summary of learning organization assessment results.

Figure 2. Summary of digital tools assessment results.

Minor positive changes are found in the use of VKontakte social media (VK) and general satisfaction with consistency between the digital tools used. A slight decrease in grades was recorded when using Zoom, which is unexpected, since during the first period of training, two significant faults related to the connection of Zoom and the equipment used happened (the teacher had to change the headset and microphone in the middle of a lecture), but the second generation had no problems with connection or technical kits. The chat was also very positive and grateful, and the chat and voice conversations through the scaling platform were active and very positive, the comments were helpful, and the responses were helpful.

The drop-in ratings for the messenger are also surprising, because the number of students' communications on WhatsApp has increased significantly; the first cohort communicated via WhatsApp less than the second (taking into account the decrease in the sample size: N1 = 46 and N2 = 31), and the third cohort (N = 34) created a very intensive chat. Apparently, it depended on the personal psychological characteristics of the persons in the groups.

The organization of the learning process with a traditional Russian university pedagogical configuration based on platform of Moodle, with the use of Zoom for lectures and email as a tool for communication, nevertheless, showed students' mediocre assessment of video conferences (lectures and part of seminars), but led to the highest evaluation of emailing as a tool for the exchange of messages (this score is, nevertheless, lower than the satisfaction of students with the messengers used for communication and exchange).

The results related to the organization of the educational process and the introduction of digital tools can be commented on by students' answers to open-ended questions.

3.2. Recommendations Received from Short-Term Program Students

The qualitative open-ended questions included two main research interests—about results and about possible improvements that need to be made. The first question, "What is the most valuable knowledge you gained during the course?", was followed with a question on whether the students would apply the acquired knowledge in practice (100% of both cohorts said "yes, I will put it into practice"). The second question, "What can be improved?", was followed by a question on whether the students would recommend the educational program to their friends (100% of both cohorts answered "yes, I strongly recommend").

3.2.1. The Assessment of the Most Valuable Elements of the Training

About half of the students in the groups responded to open-ended questions about the most valuable outcome they received from the educational program, which included:

- Practice-oriented learning and structured knowledge of theoretical lessons implemented directly in practical exercises (theory was immediately worked out in practice; valuable knowledge that was immediately put into practice; the stages of work; the basics to build general understanding and vision and to start the work; practical guidance; workshops; the work on own projects; practice-oriented training; practice and communication; practical experience);
- Efficient communication with teachers (the group and teachers were very helpful, always helping in solving emerging questions; teaching staff as personalities to exchange ideas and visions; motivation from teachers; experience of teachers);
- New environment and the opportunities and communication mode (new acquaintances; communication with interesting people; immersion in the material when preparing the final paper).

This permits researchers to conclude that the course was built correctly and corresponds to the substantial interests of students:

1. The knowledge and practice are balanced, the experience is of interest for students.
2. The clear dominant interest in practical activities is satisfied.
3. The online format is correct for this training.

4. The lack of physical, personal face-to-face communication and social integration was covered with the efforts of the personalities involved.

The conclusions demonstrate the effectiveness of the construction of the course with the implemented digital tools of communication between students and teachers.

3.2.2. The Proposed Improvements

Students gave several pieces of advice and proposals about the elements to develop:

- More practical cases and possibly intermediate testing by module; more examples about the service sector;
- Maybe to increase the duration of the course, not everything was in time for some students;
- Presentation of material by younger teachers;
- Nothing to change. Everything is fine; I have not found any disadvantages in this course yet; Always deliver this course online; Thank you for such a comprehensive course!

The answer of respondents about the increase in the service sector analysis was implemented into the second generation of the program. Other comments concerned the total satisfaction and recommendations to improve the teaching competencies of the professional specialist who gives the practical elements of the course. However, this recommendation is not very feasible, because the professors are good in teaching and professionals are good in mastering up-to-date tools and techniques of practical work; nevertheless, the increase in teaching experience will improve this impression of the next cohorts.

4. Discussion

Interpretation of feedback on coursework allows us to conclude about the effectiveness of the proposed learning process. The analysis of the assessments and reviews on the course qualities permits to present the three-dimensional grid of tools and educational components that have their spaces of intersection.

4.1. Technical and Educational Intersection

- Social media represents the place to stock materials available for the members of a closed community [30] and to assure constant access to the informational resources [31,32]. The first cohort of students met a problem—they used an open type of community, and difficulties were created with outside members who were not enrolled as students as the external persons created noise that interfered with the educational processes; the second-generation community was created in the closed form, only for the enrolled students as authorized participants;
- A messenger tool was implemented as a tool of social integration of students, enabling communication among themselves and with teachers and interaction of students to invite each other to enrich and enlarge their learning activities of different natures [33] and, first of all, to the project work [34,35];
- Zoom, as a platform to carry out video conferences, is a tool of humans' self-presentation [36] with their video stream, and the teachers passed all the time in a streaming "video presence" or just at the start point of the video conferences by introducing themselves to maintain the illusion of the reality and of existence and co-existence—participation as personalities with a quasi-physical presence.

This grid of digital tools assuring the socio-psychological elements of the learning process is crossed with the components of the knowledge creation process that produces the intellectual outcome of the course for students and the value for the educational institution.

4.2. Intersection of the Educational Process and Knowledge Exchange and Enrichment

- The cognitive process of knowledge creation includes the communication of logical paths from the teacher towards students, the correction of mistakes of rational

reasoning and methodology of research or practice, reciprocal help among students, and adjustment of the acquired competencies during the exchange of knowledge between teachers and students as well as among students themselves (which is also enriching for teachers). This process is basically fulfilled by the theoretical part of the learning, as the university professor assures the transfer of the accumulated interpretations and helps students to understand the processes and causal connections in the field of the taught material [28,37];

- The affective component of knowledge concerns the involvement of both teachers and students in efficient communication and exchange of experiences, the formation of a trustful and confidential relationship, the sense of responsibility and commitment to the duties, homework and project development of students' teams, excitation and producing emotional energy to activate the students and facilitate the design and realization of the projects. These motivational and inspiring activities are well realized by the teacher with the entrepreneurial experience;

- Behavioral modeling needs the example of the trajectory of doing by a professional to be followed by students, whereby the experienced specialist demonstrates the patterns of accomplishing tasks [38]. E-marketing is a dynamic innovative field with diverse applications and high speed of evolution of tools [39,40]. That is why knowledge creation needs the constant acquisition of new experiences [41,42]. To master and compete in this industry, the students have to follow both the existing patterns of acting and the habit to learn permanently from all sources of expertise [43].

Obviously, all teachers perform all actions during their work on the course—cognitive (explanation), affective (sensitization and mobilization) and conative, and behavioral (practice); this structure simply emphasizes three types of roles of teacher's in the classroom, including virtual classrooms. The structure of sociocultural learning helps to assimilate the vision, values, and norms [44] of building a value chain based on creativity and mobility in a knowledge society and economy of accelerating innovative growth [45–47]. The development of a play-based approach to learning [48–50] and neuroscience [19,51,52] will improve e-learning practice.

The combined analysis of the three components of intellectual process within the short-term educational programs with the implementation of the tools of e-communication and e-pedagogy demonstrates the redundancy of several elements that fulfill double and triple functions (such as emailing, pedagogical platform, and testing portals).

The analysis of the implemented tools through the three educational elements of teaching activity shows similar results (see Tables 3 and 4).

Table 3. Simplified grid of knowledge creation through three components of intellectual process.

Digital Tools Used	Cognitive	Affective	Conative
VKontakte, Facebook (social media)	+ [1]		
WhatsApp, Telegram (messenger)		+	
Zoom, Discord (video conferences)			+
Email (letters)	+		
Moodle (Pedagogical platform)	+		
Google forms (testing)	+		
Menti (testing, involving)	+	+	

[1] "+" means the essential use of the tool for assuring the intellectual process' component.

Table 4. Simplified grid of knowledge creation process through functional roles of teacher.

Digital Tools Used	Stock Available to Duplicate (Rational)	Motivation, Social Integration (Emotional)	Demonstration, Responsibility (Behavioral)
VKontakte, Facebook (social media)	+ [1]		+
WhatsApp, Telegram (messenger)		+	
Zoom, Discord (video conferences)		+	+
Email (letters)	+		
Moodle (Pedagogical platform)	+		
Google forms (testing)			+
Menti (testing, involving)		+	+

[1] "+" means the essential use of the tool for the functional role of knowledge creation for teachers.

From these two simplified schemes, we conclude about the superfluity of tools used for the cognitive process, for presentation and explanation and stock of materials—five elements are particularly conceived to duplicate external (explicit) knowledge. Only one instrument is intended to translate the behavioral component of knowledge (Zoom) and two tools help to "switch on" the emotional energy, curiosity, and hazard of students (messengers and specific portal Mentimeter).

The application of a triple grid to the teaching permitted to help with the emergency of the transfer of the course from the traditional regime into the e-learning mode. The universities' teaching staff are usually reproached for the predominance of giving theoretical knowledge and lack of practice; consequently, the practice-oriented approach was developed, and the training and case studies methods of teaching are wide-spread [53–55]. Meanwhile, the attempt to implement the triple approach to the content taught was realized: the concept borrowed from social psychology was applied to the transformation of a traditional course to the e-learning mode, imposed by the COVID-19 pandemic.

This concept defines the three-component nature of social attitude formation (cognitive, affective, and conative components); this structure is used for the composition of the complex system of intellectual outcome (logical understanding, feeling of competence and readiness to act and solve tasks, and psychomotor skills) through the knowledge creation process (rational, emotional, and behavioral) [56,57].

The connectionist approach states that the process of personal knowledge producing is carried out by the individuals involved at a moment and place of contact [58,59], even through digital tools of communications, and different personalities with their backgrounds are more efficient in helping students in the corresponding processes of intellectual activity—the teacher is efficient in teaching, in presenting logical connections, and in explaining theoretical material; the entrepreneur is capable of and suitable for motivating students and helping them to build their teams to realize their projects; the practicing professional is the appropriate person to give the specimen, the model of making things by demonstrating the example of doing and by correcting the students' mistakes and errors in practical skills.

This structured grid of a triple process and the triple outcome is superposed on the customary digital communicative tools of social media, messengers, and video conferences. The research discovered that students are more satisfied if they spend less time acquiring the auxiliary skills of using pedagogical platforms (they save their time and resources) and if they use their habitual communication tools, and the three used tools of digital communication correspond to the essential components of the knowledge creation process (explaining and duplicating knowledge, motivation, and involvement in group dynamics with competition and collaborative outcome; behavioral patterns within the professional field).

The introduction of the proposed structured grid helps the participants of the educational program to clearly distinguish the persons who should be asked questions and also contributes to the improvement of the content and organization of training. If messengers

and online conferencing platforms are a space for online communication, the use of email has been shown low interest; teachers and students did not use pedagogical platforms for organizing content such as MOOC solutions [60–62], the massive open online courses, because the materials are presented in an accessible and comfortable social network space. The idea of creating a MOOC based on the experience of two generations of trainings came from the administrative staff of an educational institution but was not supported by teachers, nor by students. This means that the ease of implementation of specific platforms for MOOCs is lower than using social media as a common place to meet and search for content.

The results showed that learning can be effectively built using conventional digital communication and interaction tools (social network, messenger, and scaling); special pedagogical platforms and particular digital education tools are needed to include an educational institution in the higher ranks of indexes and pointers [54,63–65], but sometimes, they not required by e-learning participants—e.g., when the investment in assimilating the skills to use the platform is higher than the anticipated surplus of expected knowledge to be acquired.

The conducted exploratory research can form the basis for further study of potential implementation of a similar approach for the next courses in e-learning or blended learning modes. Taking into account that during the presented experiment, we could not control other variables, it is impossible to directly transfer these results to other short-term programs or traditional university courses.

5. Conclusions

Remote working [66] and distance learning [67–69] due to the pandemic and social isolation have increased the translation of a variety of activities online. Intellectual activity, knowledge creation, and exchange of experience are digitized and transformed into a virtual space more easily than manufacturing, agriculture, or several physical services (for example, cosmetology or babysitting), but to be effective, the learning process must be socially integrated and conceived with psychological features of human cognition. The public discussion on online education, suddenly introduced on 17 March 2020 in Russia, is sharply negative. At the same time, some examples were surprisingly positive; in order to explain this difference, several hypotheses were raised.

The results obtained allow the researchers to conclude that it is advisable to build training as a combination of the traditional structure of material and training (theoretical and practical parts), three-component involvement of teachers (with a professor, an experienced entrepreneur, and a professional who gives specific and relevant knowledge in practice), and digital tools implemented to assure the social processes of knowledge creation as well as the intellectual elements of cognition and to improve the management of educational institutions [70].

The novelty of the study consists in answering the question of the factors behind a surprisingly positive impression of students of one e-learning program with the overall highest assessments, contrasted with the negative public discussion in Russia about remote learning and the lower level of participation in the survey by the students of the short-term online program given with the pedagogical platform. The paper demonstrates that the high level of the overall assessment given by the three cohorts is based on the separation of the nature of involvement between teachers, where intellectual exchange as a rational process is provided by a high-skilled professor, doctor of sciences; the motivational activities to support the educational process and the emotional atmosphere maintenance are carried out by an entrepreneur, and behavioral training through practical projects is carried out by an invited specialist with an actualized professional background.

Several remarks are to be mentioned that determine the limitations of the results obtained. The study was carried out for the purposes of exploratory research of the factors explaining the unexpected satisfaction of students. The samples for the research were composed as they were due to the involvement of the researchers in teaching at universities. The research can be the basis for following methodical recommendations

for the short-term programs developed for limited fields (communication, management, marketing, digital technologies, etc.) and for limited categories of populations (highly motivated for learning).

The potential implementation of the triple approach to construct short-term programs in the form of e-learning through "ordinary" digital communication tools can be the subject of future research. The enrichment of educational techniques with learning games (where "learning through an entertaining way fosters student motivation to increase engagement in the educational process" [71]) already showed the necessity to go from a classical university academic style of teaching towards students' motivation and involvement [72,73]. The economy of innovative growth and constantly changing labor market [74–76] induced the life-long learning approach that requires further movement from institutional education to the everyday lives of students.

Appendix A. Students' Assessment of the Organization of the Educational Process

Table A1. Points awarded by students on the elements of the organization of the educational process, July 2020 (N1 = 46).

Element of Learning Process	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
Lectures			3	5	32	6	4.891
Practical workshops			2	5	12	27	5.391
Project work		1		7	22	16	5.087
Teamwork [1]	6	6	4	14	16		3.217
Control, examination			1	2	41	2	4.957
Communication with teachers			1		40	5	5.065
Interaction among learners		1	3	5	28	9	4.848
Actual character of the material		1			29	16	5.239
Final paper preparing		1	1	4	21	19	5.174

[1] The unsatisfied students, perhaps, have chosen to work individually; both options of team or individual projects were proposed, and the choice was made by students themselves.

Table A2. Points awarded by students on the elements of the organization of the educational process, September 2020 (N2 = 31).

Element of Learning Process	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
Lectures			1	3	23	4	4.968
Practical workshops			1	5	9	16	5.290
Project work		1	1	3	19	7	4.903
Teamwork	1	2	4	9	14	1	4.000
Control, examination			1	1	28	1	4.935
Communication with teachers			1	1	20	9	5.194
Interaction among learners			2	4	20	5	4.903
Actual character of the material			1		15	15	5.419
Final paper preparing			1	7	21	2	4.774

Table A3. Points awarded by students on the elements of the organization of the educational process, December 2020 (N3 = 34).

Element of Learning Process	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
Lectures			1	6	22	5	4.912
Practical workshops			2	7	11	14	5.088
Project work		3	1	5	17	8	4.588
Teamwork	3	2	2	8	18	1	3.941
Control, examination			1	1	30	2	4.971
Communication with teachers			1	1	22	10	5.206
Interaction among learners			2	4	22	6	4.941
Actual character of the material			1		15	18	5.471
Final paper preparing		1	2	9	18	4	4.588

Table A4. Points awarded by students on the elements of the organization of the educational process in the framework of the traditional university pedagogy configuration, November 2020 (N4 = 67).

Element of Learning Process	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
Lectures			1	6	53	7	4.985
Practical workshops		2	5	23	9	8	4.255
Project work			1	3	19	7	5.067
Teamwork	3	2	4	8	4		3.048
Control, examination			5	11	39	2	4.667
Communication with teachers			8	11	20	9	4.625
Interaction among learners			2	4	11	1	4.611
Actual character of the material			1	2	22	1	4.885
Final paper preparing			1	7	9	1	4.556

Appendix B. Evaluations of Used Digital Instruments Given by Short-Term Program Students

Table A5. Points awarded by students for digital tools applied, July 2020 (N1 = 46).

Digital Tools Used	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
VKontakte (social media)			1	6	33	6	4.957
WhatsApp (messenger)			1	3	19	23	5.391
Zoom (video conferences)		1		5	18	22	5.261
Email (letters)			5	8	2		3.800
Coordination between tools			1	1	40	2	4.977

Table A6. Points awarded by students for digital tools applied, September 2020 (N2 = 31).

Digital Tools Used	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
VKontakte (social media)				3	21	7	5.129
WhatsApp (messenger)			2	2	17	10	5.129
Zoom (video conferences)				4	15	12	5.258
Email (letters)				3	1		4.250
Coordination between tools			1	2	22	6	5.065

Table A7. Points awarded by students for digital tools applied, December 2020 (N3 = 34).

Digital Tools Used	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
VKontakte (social media)			1	8	16	9	4.971
WhatsApp (messenger)				1	15	18	5.500
Zoom (video conferences) [1]		1	2	2	17	12	5.029
Email (letters)				1			4.000
Coordination between tools				1	39	4	5.068

[1] During the theoretical part of learning, one of the lectures was delayed due to a Zoom error, in October 2020. This technical inconvenience provoked the lower assessment of Zoom use.

Table A8. Points awarded by students for digital tools applied in the framework of the traditional University pedagogy configuration, November 2020 (N4 = 67).

Digital Tools Used	Bad	Poor	Satisfied	Good	Excellent	Brilliant	Average Point
VKontakte, Facebook (social media) [1]							- [1]
WhatsApp, Telegram (messenger)			1	5	28	1	4.829
Zoom (video conferences)			2	12	48	5	4.836
Email (letters)			2	14	51		4.731
Coordination between tools		5	36	20	2	4	3.313

[1] No social media were used during the course. Several respondents were initially contacted through Facebook or VKontakte.

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