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International Scientific Conference**THE PANDEMIC'S IMPACT ON THE LEARNING PROCESS:  
CASE STUDENTS OF MINING UNIVERSITY**

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**Abstract**

Based on the data of the sociological survey, the consequences of the corona virus epidemic on various aspects of the studying process in the university educational system from the point of view of the student community are identified and analyzed. It is established that not all universities were ready to teach their students in a remote format, but, according to students, quarantine and experience may have triggered the digitalization of the educational process. Therefore, in order to prevent possible negative consequences of the pandemic in the future, it is proposed to consider the availability of a special internal educational platform for remote education based on learning management systems and creation of digital educational resources in all subjects as a mandatory indicator of the university's activity. In addition, universities should make every effort to improve the qualifications of their teaching staff in the application of information and communication technologies in the teaching process and to improve the technical equipment of the students' and professors' working. The positive consequences of the sudden transition to remote teaching include improved skills in working with electronic resources and technical devices, increased self-discipline and self-organization, as well as a reassessment of values related to young people's personal communication and teamwork

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## **1. Introduction**

The current epidemiological situation and the related quarantine regulations have very clearly divided society into those who, thanks to digital skills and knowledge, have been able to develop themselves, and those whose lifestyle has been severely distorted, those who were able to adapt to the new reality of remote work and study, and those whose education and work activities were put on hold. This has made the topic of digital literacy and people's readiness for life and work in the digital economy, where millions of managerial, technical, social and business processes are implemented in virtual rather than physical space.

Throughout the developed world, it seems that the economic impact of the epidemic can best be overcome through "socio-cultural immunity", acquired through the experience of a huge number of people and institutions leading digital lifestyles. In addition, people have experienced gaps in digital competence, which should form the basis for many people to develop themselves continuously in this area.

## **2. Problem Statement**

The impact that the Corona virus has had on the higher education system varies from country to country and is specific to different regions of the world. However, the general pattern of these changes can be traced: the pandemic has put universities under difficult conditions, forcing them to adapt to events as quickly as possible, to spend significant resources on accelerating the digitalization of education, and to make decisions often without considering the possible consequences. The pandemic has had a negative impact on international development in education and science: international internships and trips have been cancelled, exchange and academic mobility programs for students and teaching staff have been suspended, and many research cooperation programs have been put on hold (Karpinskaya, 2019).

Universities have been forced to solve many urgent questions in a short period of time: what forms of distance learning should be conducted; what technical means should be used for this purpose; how to assess the level of knowledge obtained from distance; how to conduct final examinations and thesis; how to enrol applicants for the next academic year.

## **3. Research Questions**

### **3.1. Study of the impact of the pandemic on higher education system**

The International Association of Universities (International Association..., 2020) undertook a survey on the impact of the pandemic on university education in the world, involving students, professors, administrators and university heads from 109 countries. The survey revealed the following:

- Most universities have managed to switch to the online learning format, which has affected the organization of communication between students and professors, and a small number of universities (9%) still do not have the appropriate infrastructure to organize this kind of communication;
- Universities are expecting a decrease in the number of applicants (both foreign and locals), but admission of foreign applicants will decrease to a greater extent;

- Most universities in the process of switching to online study format have consulted with national education ministries, which have provided information support to universities, but state financial support has not been provided to most universities;
- According to universities, the impact of the pandemic on universities' collaboration is ambiguous: some of them are weaker, but in some cases, connections have been strengthened and universities have been able to find new formats of collaboration: universities talk about virtual mobility of students and teachers, exchange of methodological materials for online teaching, etc.
- During the pandemic, most Universities completely switched to online teaching, but 7% of Universities stopped their activities at all. At the same time, universities representatives noted the following problems: insufficient technical infrastructure to provide the online studying both at universities and in the students' residence; insufficient competence of teachers to conduct online classes; inability to teach some subjects online, e.g., medicine, chemistry, technology, etc.; problems in organizing online examinations;
- The pandemic has affected research: academic exchanges have been suspended, international scientific conferences have been postponed and most scientific projects, both national and international, have not been completed in time.

The emergency switch to distance learning has also created a number of international and national problems that are interrelated:

- Some countries have been unable to switch to online education for various reasons, including lack of logistical support for universities, lack of wide coverage of the Internet, low living standards, etc. The University of Buenos Aires has decided to cancel classes and change the academic calendar instead of switching to online learning, believing that only full-time education can guarantee a high level of quality;
- In a number of countries, students have spoken out against the switch to distance learning. In the Philippines, there have been strikes against it, demanding that the contract be terminated and that tuition fees be refunded because distance learning is not an equivalent substitute for traditional forms of learning, and because of the lack of necessary equipment and poor Internet access;
- In the UK, more than 300,000 students have signed the "Reimburse all students of this year's due for strikes and COVID-19" petition, demanding that tuition fees be refunded;
- Occasionally problems arose with online platforms, through which universities held distance lectures or seminars. Due to the hacker attacks, online training at a number of leading universities was temporarily suspended.
- Universities websites were unstable due to the increased load on university databases and information systems;
- The qualifications of employees to switch to online learning were insufficient: they lacked knowledge of effective online teaching methods, available platforms and services for remote learning, etc.

The pandemic has triggered a worldwide trend towards online learning. The advantages and disadvantages of this form of education are still the subject of controversy between scientists and researchers (Bowen, 2015; Dommet et al., 2020; Owston, 2013; Owston et al., 2013). Famous Western experts in the field of higher education development (Altbach & de Wit, 2020) express doubt that the pandemic will lead to a technological revolution in higher education. Nevertheless, it is clear that distance learning methods will be increasingly used. However, the switch to effective online learning will require a lot of time and resources and support from key stakeholders interested in developing quality online education. The financing of the educational process is discussed in detail in (Claeys-Kulik & Estermann, 2015; Gherghina & Crean, 2012; Senashenko, 2017; Wolff et al., 2013).

### **3.2. Study of the impact of the pandemic on students**

The pandemic has had a diverse but very strong impact on students. According to a report by the International Labor Organization (2019), 65% of young people reported that they had gained less knowledge during the pandemic because they had to switch from full-time to online or remote, distance learning as a result of the closure of educational institutions. All of them were eager to continue their studies, but half of them now believe that their studies can take longer and 9% are not sure if they can complete it. According to the report, 38% of young people are unsure of their own career prospects, as the crisis is expected to create additional difficulties in the labor market and extend the transition from university to work. Many young people have already experienced the direct impact of the pandemic: one in every six young people has been forced to stop working since it started. Many young people tend to work in areas that are most affected by the crisis, such as technical support, services and sales. This makes them more vulnerable to the economic consequences of the pandemic. Among those who continued to work during this period, 42% had a drop in income.

All this could not but have an impact on the psychological state of young people. The report notes that 50% of young people have the potential to feel anxious or depressed, and 17% have already experienced these problems.

It should be noted that the rapid transition will inevitably cause significant damage to the quality of education and, consequently, to the reputation of higher education institutions. In addition, when moving to distance education, it is also worth considering the welfare of different societies, which may lead to discrimination against different population groups and an even greater gap between different layers of society. However, for many reasons, students and teachers will continue to give preference to full-time higher education. For example, the University of Bologna has made every effort to resume classroom activities in the autumn of 2020, while respecting all standards of protection for all participants in the educational process against the risk of infection (preliminary and limited enrolment in lectures, student chess seating, airing classrooms every 30 minutes, maintaining a social distance, etc.). Traditional full-time university education is likely to become the privilege of the wealthiest students studying in the world's leading universities in the future (Murphy et al., 2019).

## 4. Purpose of the Study

The authors have set themselves the goal of analyzing the impact of quarantine on the various components of the educational process at universities and finding answers to the following questions:

- Identification and analysis of the positive and negative effects of quarantine in universities from a student perspective.
- Identifying trends in eliminating negative consequences of the pandemic in Universities and preventing them in the future.
- Assessment of the impact of quarantine on the digitalization of education.

## 5. Research Methods

### 5.1. Analysis methods

The authors used the methodology for identifying scientific problems based on the analysis and generalization of scientific research on the research problem. The survey method chosen by the authors was the process of identifying the views and actions of the interviewees through a personal conversation or using the social platforms. The undeniable advantage of the survey is its rapidity, simplicity and cost-effectiveness, and the convenience of processing results. Based on the statistical processing of the data obtained, a factor analysis was carried out, the task of which included the selection, interpretation and systematization of the factors that had the greatest influence on the educational process at the university using the methods of bar charts. The conclusions of the survey were drawn based on statistical processing of the data obtained.

### 5.2. Methodology of survey

At September 2020, after the quarantine measures had been lifted and face-to-face studies reinstated, the authors organized a survey among first- and second-year students who had fully experienced the difficulties of a sudden switch to remote training. More than 800 students with different specialization took part in the survey. A formal ethics board for the institution had yet to be set up during the time of data collection, so, the survey administrators incorporated ethical compliance procedures as part of their data collection implementation. Prior to filling out the online survey, the objectives of study were explained to students and they were also invited to indicate informed consent of voluntary participation. The participants were presented with questionnaires compiled in Google Documents. The response time was limited to one week, so respondents had the opportunity to choose their own free time for informed answers to questions. After one week, the answers were collected, processed and analyzed by the researchers. The survey questionnaire consisted of 6 questions in a closed form or with multiple choice: closed questions allowed the researchers to rank the facts they were interested in; multiple-choice questions allowed us to identify the dynamics of opinions, assessments and moods, as well as to record subjective impressions.

As a result of the survey, we wanted to obtain students' opinions on the organization of remote training or get answers to the following questions:

- Which format of study do you prefer: face-to-face; distance; mixed.

- What difficulties have you experienced during unplanned distance learning.
- In what format would you prefer to take the exam in the future.
- What measures should the University take to improve the quality of online learning.
- To what extent can the pandemic serve as a stimulus for the digitalization of education?
- What advantages did you notice of remote studying.

## 6. Findings

### 6.1. Results

Processing and analysis of students' answers showed us the following results:

- Since the survey involved full-time students, the majority of them chose to attend classroom lessons (53%), a quarter of whom were ready for mixed learning, and only 21% agreed to distance learning.
- Due to the unexpected switch to remote education, 87% of respondents experienced various difficulties in remote education and only 12% were ready for a sudden change of format. The majority of students (58%) mentioned that there was too much learning material. From a professor's point of view, the subjects were given in the normal amount, and this impression was created by the fact that students had to study most of the material themselves. As we know, self-study skills are poorly developed, because the school curriculum is mostly 'passive', with the teacher giving out the material and students only accepting it. However, as we can see, only 21% of students are aware of this fact. 55% of respondents pointed to limited (or no) communication with the professor and regretted that it was impossible to get an immediate response from the professor on the material being taught. In conditions of forced isolation, many felt uncomfortable not only because of the professor's poor accessibility, but also because of the lack of teamwork and limited communication with each other - 36% of respondents told us about this. Approximately a quarter of those surveyed (22%) said that there were no suitable conditions for learning. However, only 14% of those interviewed complained about the poor technical equipment of the training process.
- The vast majority of students (63%) chose to pass the exam in test format in the classroom. This choice may be due to the tradition of Mining University. Only a quarter of those surveyed approved the remote exam in the format of an interview via videoconference.
- 72% of students expressed the opinion that the main task of the university in using remote learning is to create a special internal educational platform. In addition, more than half of the respondents mentioned the need to prepare professors for working with new information technologies. Almost 40% of students said that they need material or technical assistance to equip their workplace.
- 75% of respondents support the idea that the pandemic had a significant impact on the digitalization of education.
- It is not a secret that some students start working to improve their financial situation and help their family. This is probably why 62% of those surveyed said that they have saved their

budget and time, and some said that it is possible to combine study and work more comfortably (32%). 48% of trainees said that they liked learning materials in their own mode, and an equal number said that they improved their skills in using electronic equipment and resources. According to the authors, the most significant advantage of remote learning was the formation of personal qualities such as self-discipline and self-organization, which was noted by almost half of those surveyed.

## 6.2. Discussion

The switch to remote education in the context of the pandemic occurred unexpectedly and rapidly. Not all universities were ready to teach in this format. Therefore, the availability of a special internal educational platform should be considered as a mandatory indicator of a university's performance. The placement of teaching materials in Learning Management Systems (LMS), such as Moodle, Skolera, Talent, Neo, etc., provides an opportunity to use both remote and mixed forms of education, which is especially important in case of emergency situations. However, lectures and practical exercises remain an integral part of the learning process, especially in the teaching of mathematical subjects. Modern learning technologies provide a great variety of forms of teaching these classes. Lectures are easily organized using video conference services (e.g. Cisco Webex, Skype, Microsoft Teams, etc.). Most of these services allow excellent feedback from students, contain built-in whiteboards (which makes it much easier to display formulas and graphical drawings on a monitor screen), and allow the necessary documents and desktop to be shown to both teacher and student (Sulima, 2017). In this way, these services also provide the opportunity for full practical lessons in an online format.

Remote exams remain an important issue, according to (Butler-Henderson & Crawford, 2020). It is necessary to improve the method of online examination. The following has been demonstrated in the spring 2020 exam session:

- The low technical equipment of the professor or student makes it difficult to take the exam quickly. Mathematical disciplines require a large number of formulas to be written, and not all students have the skills to type them quickly. The presence of graphics tablets is seen by all participants in the exam as a solution to this problem;
- Saving the video recording of the exam allows the Appeals Board to easily resolve the issue of the fairness of the assessment in the event that a student disagrees with it, even without holding an additional exam.

In our survey, most students would prefer to take exams and test in the classroom. Of course, it was quite difficult for them, who were used to marking the correct answers in the test, to prepare for the oral exam on their own, and also to answer the professor's questions in front of the screen. At the exam, all measures were taken to identify students and control the process of passing the exam (preliminary examination of the workplace, checking the availability of additional technical equipment). However, the analysis of the results of the spring exam session surprised and delighted the professors: the majority of students really took the exam preparation seriously and their performance increased by 20% compared to the performance of the winter exam session in the same groups and by 15% compared to the performance of the previous year.

In order to use these technical means effectively, attention must be paid to training professors to work with them. According to Aimaletdinov et al. (2019), the digital literacy index for university professors is 88%, but only a third of them use digital technologies in their educational process and this index is decreasing as the age of professors increases. After age 55, the indicator drops to 18%, and it is known that few universities can provide young staff. Therefore, universities, perhaps with the participation of federal authorities, need to introduce educational programs for professors to adopt innovative technologies. The authors proposed in (Bakeeva et al., 2020) a modular system of professional retraining, the advantage of which is the continuity of education and the possibility of using the considered technologies directly in the educational process. In (Kozhukharova, 2018) the idea of creating educational clusters for lifelong learning and advanced training of teachers is put forward in order to develop and introduce innovations in the education process at all levels.

Bhagat et al. (2019) recommends identifying the personality traits of students in order to adapt the studying materials to the participants of the educational process, which leads to an increase in the efficiency of the learning process and an increase in academic performance, although in the face of an unexpected switch to online learning, such an opportunity is not always provided. A number of authors also suppose more careful consideration of the interests and needs of students in the learning process (Joosten & Cusatis, 2019; Shearer et al., 2020).

The analysis carried out above showed that students enjoyed studying the material in "their" mode. The volume of educational material provided, for example, for in the Mathematics program is large, which determines a fairly rapid pace of presentation. Since the initial level of mathematical training and the ability to perceive new material varies among students (Shabaeva, 2020), some of them do not have time to learn the necessary amount of information in the course of their studies. Studying the subject in a comfortable mode, according to the plan proposed by the professor, supported by the necessary teaching aids and consultations, allows students to master the teaching material without stress. However, this process must be based on properly presented learning content, for example, in the form of an electronic textbook - a resource that will inform the student in a given amount of the discipline, check the quality of learning, and require reflection and understanding of the links between mathematical and professional concepts. Each section of the textbook must end with a test summarizing the knowledge in that part of the course. The final test should be presented at the end of the textbook with questions that suggest correlations and highlight patterns from the different sections. The set of tests will provide a comprehensive overview of the discipline being studied and its place in the professional knowledge. The data of educational analytics make it possible to predict the success of students studying using online platforms, to single out students in "risk groups", to predict the distribution of students by success groups and, if necessary, to adjust teaching materials (Ozerova & Pavlenko, 2019).

The most significant advantage of remote learning, according to the authors, is the personal growth of students, which is reflected, in particular, in their self-discipline and self-organization. The skills of independent work are becoming more and more important every year (Mota & Scott, 2014). The flow of information, in conditions of its rapid obsolescence, which is necessary for a successful career, is growing exponentially, so the task of developing the needs and skills of a person is brought to the fore not only to independently acquire and update knowledge that is important for the profession, the individual and society,



but also to carry out this process continuously throughout life, which is impossible without a high level of self-organization. The development of logical, rational, critical and creative thinking, as well as cognitive abilities of the learner, the disclosure of moral and other abilities of the individual on the basis of his or her individual capabilities is facilitated by the application of such forms of learning as problem, modular, contextual, heuristic, personality-centered learning in the learning process (Bakeeva et al., 2020).

## 7. Conclusion

Therefore, we see that even serious trouble as a pandemic can improve students' personality.

The authors agree with the opinion of the surveyed students that the forced transition to new technologies of education can serve as a catalyst to accelerate the process of digitalization of education. The pandemic updated the topic of digital literacy and people's readiness for life and work in the digital economy, which, in turn, set a number of urgent tasks for higher education institutions.

Under the circumstances, the priorities for universities may include the following:

- Development of support for students and professors: finding ways to level out the inequality between students (Internet access, availability of necessary equipment, suspension of tuition fees, targeted material assistance, loans for students from low-income families or those without parents);
- Creation of a special internal educational platform based on learning management systems and digital educational resources in all subjects;
- Organization of training courses for professors concerning methods and techniques of organizing online learning, functionality and possibilities of available platforms and services (including Google Classroom, Microsoft 365 Groups, Moodle, iSpring), organization of a special platform for exchange of experience between professors in the field of online learning organization, joint search for solutions to problems arising in the process of learning organization, methodological assistance in adapting programs to forms of online learning;
- Psychological and financial support for students and personnel;
- Aligning knowledge assessment criteria and procedures with the new online timetable and pedagogical approaches. The development of distance learning assessment methods will require considerable effort, but this will ensure the quality of learning and the validity of final evaluations in the future.

The authors plan to focus their further research on the analysis of future changes in the field of digitalization of the educational process and take an active part in the development of digital educational environment of the university.

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