Examining Technology and Teaching Gaps in Russian Universities Amid Coronavirus Outbreak

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Abstract. The current study facilitates an evidence-based discussion on teaching during the period of an abrupt shift to virtual classrooms caused by coronavirus spread. There has been a massive investment to bring technology to universities; however, there are some significant gaps that must be addressed. The first is the availability of university online platforms and the second is the digitalization of the curriculum combined with teachers’ confusion and anxiety around the ability to adjust to the new digital environment. The study is aimed to research the current situation at two Russian universities: RUDN (People’s Friendship University of Russia) and PNRPU (Perm National Research Polytechnic University) and describe what changes have been implemented into teaching by the university administration and professors. The research questions include two groups: 1) Learning management system (LMS): Did the university offer a teaching platform to be used by all teachers? Or was it an individual choice of every teacher? 2) Curriculum: Did teachers have to modify the content of their course? In what way? Our study contributes several meaningful findings regarding understanding the advantages, disadvantages, and challenges in changing the education landscape.

Keywords: Coronavirus \cdot Curriculum \cdot Learning management system \cdot Massive Open Online Course

1 Introduction

Every time a crisis hits the economy in general or industry in particular it has no choice than to adapt to a new environment and go ahead. The spring of 2020 was an extremely challenging time for higher education worldwide when universities had to make rapid and hard decisions to shut down in-person classes and transit to online teaching to fulfill commitments to learners.

Lockdowns increased the number of online learners up to 89.5\% of the world learners including those enrolled at universities, according to UNESCO [1]. On the
other hand, the research made by the Monitoring of Educational Economics of Higher School of Economics before the coronavirus crisis revealed that digital technologies accounted for 4% of all educational technologies offered by higher education in Russia in late 2019. Only 1% of all students received their diplomas on MOOC (Massive Open Online Course); 73% of students and 41% of teachers never heard about the possibility of getting higher education on MOOC; 11% of teachers had their training on online platforms and 40% planned to do it in the future [2].

As a result, almost all Russian universities struggled and continue to struggle with accommodating online teaching due to different reasons. Among them, one can name technical reasons and considerations with online education technologies which include familiarity with online technologies and tools and teaching approaches, and professors’ and students’ easy access to Wi-Fi. Universities have to train academic staff to use online educational technologies and adopt a new methodology of teaching content online while involving students in online discussions. Professors should be ready to embrace online teaching and motivate students to get and stay engaged in learning.

The virus has not only revealed vulnerabilities in the higher education system but emphasized that it has to be flexible and resilient to respond to unpredictable changes in the future.

2 Literature Review

Classroom management during the COVID-19 pandemic when educators use various tools to maximize collaboration, creativity, communication, and students’ engagement is often used interchangeably in educational circles now (e-learning, online learning, digital learning, technology-based learning, distance learning, remote learning, synchronous learning). Typically, they refer to the educator’s capacity to construct curricula, design student assessment by taking advantage of synchronous and asynchronous learning which works best in digital formats [3, 4]. COVID-19 is the greatest challenge for teachers to harness the power of technology to extend learning.

Nowadays, rearranging the landscape of education is a vital element of institutional response. Therefore, it is extremely crucial to follow certain rules and standards. The internationally recognized ISTE (International Society for Technology in Education) Standards provide “clear guidance for the skills, knowledge, and approaches students need to succeed in the digital age” [5]. We would like to list the standards for students and teachers as we believe they are highly essential elements of any technology-rich learning environment, especially amid coronavirus outbreak. ISTE standards for students: 1) Empowered Learner, 2) Digital Citizen, 3) Knowledge Constructor, 4) Innovative Designer, 5) Computational Thinker, 6) Creative Communicator, 7) Global Collaborator [6]. ISTE standards for teachers: 1) facilitate and inspire student learning and creativity; 2) design and develop digital age learning experiences and assessments; 3) model digital age work and learning; 4) promote and model digital citizenship and responsibility; 5) engage in professional growth and leadership [7].

A huge array of scientific papers has been published about how to ramp up teachers’ ability to teach remotely in the context of the COVID-19. These publications cover several major topics. For example, a researcher Petar Jandrić classifies current
reality as post-digital viral modernity with viral education, viral post-truth, and viral open science [8]. Sir John Daniel proposes a selection of professional development resources that educators can adopt during remote learning: The Commonwealth of Learning is an intergovernmental agency of the Commonwealth tasked with helping developing countries use technology effectively in education and training at all levels; UNESCO’s list of educational applications (digital learning management systems), platforms (collaboration platforms that support live-video communication) and resources (self-directed learning content), Massive Open Online Course (MOOC) platforms; collected resources on digital tools and general tutorials for online teaching. The tutorials were prepared by David Gaertner, an Assistant Professor and a settler scholar in the First Nations and Indigenous Studies Program at the University of British Columbia [9]. Some scientists raise the issues about how the pandemic has amplified the existing societal and educational inequities [10].

There is an earlier study of academic teachers’ experience in Norway conducted by the Centre of Experimental Legal Learning [11]. The survey is based on 172 responses and identifies the needs and challenges of the academic staff, significant changes in teaching methods, and approaches to conveying the curriculum. The study reports that the majority of respondents are positive about innovations. Based on the findings and their interpretations, the study provides a set of recommendations to academics and teachers in order to make short-term adjustments in the subsequent rounds of online teaching.

A scholar from Indonesia has designed a primary school student worksheet based on the scientific literacy of indicators in the COVID [12]. Other authors have designed the action plan that could be implemented at the time of COVID-19 to provide high-quality distance education at Beijing Normal University and to train academic staff to be more resilient to similar crises. This guideline embeds the following actions: 1) immediate dissemination of information via email, Wechat and school website; 2) development of open educational platforms which allow access to the high quality of learning resources; 3) quantitative and qualitative research and evaluation of current e-learning models; 4) cooperation between universities, international organizations [13]. Moreover, there are publications about challenges and opportunities for the education system in Morocco [14], India [15], Mexico [16], and Turkey [17] in the context of coronavirus.

There is a considerable amount of literature on the implications of the COVID-19 outbreak on medical education [18, 19], in particular the examination process and the way to assess student’s performance and competence [20, 21]. There have been analyzed peculiarities of pediatric [22], vascular surgery [23], urology [24], pharmacy [25] education, pre-clerkship, and clerkship learning environments, how to organize virtual classes and what educators could do to create experiences for students who are usually assigned to inpatient or outpatient rotations [26].

Besides, there are some crucial findings regarding COVID-19's implications on an educator’s role. Experts believe that teachers are becoming curators for virtual learning environments. They create problem-solving activities for students and let them get to
the bottom of complex situations on their own. In such an education ecosystem, students can self-regulate their learning switching to video tutorials or guidance from teachers when they need to learn new skills to proceed [27].

3 Methodology

The survey was conducted in the context of the Russian higher education system to respond to the measures that were imposed by the government amid the coronavirus outbreak. Our knowledge of synchronous and asynchronous teaching during total lockdown is largely based on responses from two universities: the Russian University of People’s Friendship (RUDN) and Perm National Research Polytechnic University (PNRPU).

The objectives of the survey were as follows:

1.1. To identify which online services and pedagogical techniques were employed.
2.2. To determine obstacles and challenges in digital learning.
3.3. To evaluate teachers’ workload in delivering online courses.

The content of the survey can be synthesized as follows:

1. Learning management system (LMS): Did the university offer a teaching platform to be used by all teachers? Or was it an individual choice of every teacher? Did students have a voice in decision making? What platforms were used? What was the choice based on? What advantages and disadvantages did teachers find in a new educational system?

2. Curriculum: Did teachers find any suitable MOOC courses? Did teachers have to modify the content of their course? In what way? Did teachers use interactive forms of digital teaching? Did teachers plan to increase the online part of their courses in the future after the crisis? Or did they plan to return to the before-the-crisis way of teaching? Did teachers receive technical support from IT-staff?

Two following research methods were employed in the study: descriptive statistics and qualitative analysis of free responses to the survey questions.

4 Results and Discussion

The research has also a specific aim to describe and compare the experiences of the academic staff from two Russian universities. The paragraph focuses on how online education was organized with specific reference to two divisions of the Universities: Mass Communication Department (42 members) of RUDN University, Moscow, Russia, and Foreign Languages and Public Relations Department (34 members) of Perm National Research Polytechnic University, Perm, Russia (see Fig. 1).
4.1 RUDN University

RUDN University had to cancel face-to-face lectures and switch to online teaching to try to halt the spread of the coronavirus. On the one hand, the University is technology-equipped for computer-based learning. There are two centralized online collaboration workspaces that professors and lecturers can use. They are Microsoft Teams and a Telecommunication Education and Information System (TEIS) based on Moodle platform.

TEIS – is an educational environment, an ecosystem where a teacher can manage all learning activities such as creating an online course, sending messages, sharing class materials, assessing students, enhancing collaboration, or tracking achievement and make learning accessible from anywhere. It encompasses a collection of links to useful resources, photos, inspirational videos, and interactive assignments and tests. Students need to enter corporate e-mail to access TEIS, so it is quite a secure environment that helps students to stay safe online.

RUDN University has a commitment-based Microsoft Volume Licensing agreement (Microsoft Enrollment for Education Solutions) that allows academic staff and students to utilize all Microsoft applications. To shift to remote learning teachers were suggested to use Microsoft Teams. It is a shared space that provides group chat, channeled conversations, instant messaging, live document collaboration, audio or video calls, and meetings. That is why the majority of lecturers of the Mass Communication Department used MS Teams for online seminars or virtual meetings (see Fig. 2).

![Distribution of respondents by position.](image-url)

**Fig. 1.** Distribution of respondents by position.
Our survey revealed various challenges in online education. The most frequently identified obstacles are struggling with a lack of experience in online programs (63%) and a lack of knowledge about converting paper-based exercises into digital forms (59%). The administration of RUDN University organized training courses for academic staff to reduce techno-anxiety. But the question of how to adapt the style of teaching to digital space fell on teachers’ shoulders and intuition. The next obstacle is an attempt to balance online teaching with parenting (23%). According to educators, there were a lot of confusing situations when teachers’ kids’ heads popped into a virtual lesson. Respondents also said about zoombombing (14%), where uninvited participants interrupted meetings and distracted students’ attention. So many teachers decided to switch from Zoom to Microsoft Teams. Moreover, the study demonstrated a lack of participation in online discussions (41%), especially compared with face-to-face interaction during traditional lessons. In the professors’ opinion, students seemed to experience some sort of anxiety and lack of confidence in an unfamiliar environment.

The survey also found out that teaching at a distance requires much more of an educator’s time. Academic staff had to design courses from scratch to be taken fully online. Most of the time was spent on creating PowerPoint presentations (73%) and giving feedback on students’ projects (54%). The new digital environment has greatly intensified and increased the teachers’ workload. Finally, the study showcased the ideal class size for an online course. The ideal traditional practical class size was 18 students while for digital learning it decreased to 11 students.

4.2 PNRPU

Perm National Research Polytechnic University had to transit to online teaching within a week. That was a challenging week for the professors and lecturers. On the one hand, the University has the technical resources to rapidly change the mode of teaching. There are three centralized university services that professors and lecturers can use.
They are BigBlueButton and two Moodle platforms: one for engineering faculties and another one for the Faculty of Humanities. Each of the platforms provides technical and methodological assistance in creating content and using it; one can find the contacts of technical staff when registering on the platform.

Moodle is an excellent option for distant and blended learning and has a lot of practical features: adding texts, links, images, videos, uploading support documents, working with students’ assignments: setting the deadlines, making comments, and grading works. There is an option to link to Bigbluebutton and Zoom video conferences and teach in real-time.

BigBlueButton is a platform for online education. It is an open-source web conferencing system for online learning. BigBlueButton runs within one’s web browser. There is no need to download a plugin, or to install the software. It is supported by all major browsers, including Chrome, FireFox, Safari, and Safari Mobile. BigBlueButton provides high-quality audio, video, and screen. It has a “mobile-first” design. Its interface can be run on a mobile device with no need to download or install a mobile app. BigBlueButton has a useful feature that enables an instructor to recall, demonstrate, apply, or ask questions about the teaching material. The platform has tutoring/virtual office hours, flipped classrooms, group collaboration, and online classes. Instructors can use BigBlueButton for engaging students and bringing virtual classrooms closer to a traditional classroom. They can exploit multi-user whiteboard, break out rooms, public and private chat, polling, shared notes, emojis.

Thus, the University has all the necessary technical resources to meet the educators’ demands and organize online teaching most efficiently. So, why then transition to online teaching became a formidable problem for a part of teaching staff.

At the end of March 2020, when the COVID-19 forced the University to move on to online, many thought that the lockdown would only last for a couple of weeks. The university administration issued the order to organize online teaching using Moodle, MOOC, Coursera, and other available resources. There were no guidelines or step-by-step instructions about the platform, mode of teaching (distant/online), or recommendations on how to organize the process. All the aspects were given to the consideration and responsibility of the Chairs and teaching staff. They had to work out feasible solutions to the questions. They also had to consider the technical possibilities of students who could have limited access to online technologies.

All the above mentioned revealed that the University was not ready for a rapid transition to online education. The academic staff was expecting clear guidelines and unified policies on the recommended online platform, webinars on how to accommodate it in teaching different subjects, how to make online lesson plans, and many other things. On the other hand, many professors enjoyed the freedom of making their own decisions about what online platforms to use; or decision was made due to technical characteristics of the electronic devices at their disposal. However, such variety sometimes posed obstacles to students who had to adapt to different resources utilized by subject teachers.

A survey conducted 2 months after the lockdown revealed ambivalent attitudes of the academic staff to the enforced online teaching. Younger and middle-aged teachers considered it as a challenge and were ready to seize the opportunity, improve their technical skills and master new tools, while teachers “over 60” believed that the
situation was temporary and were rather reluctant to change the way they were teaching. If they had had any choice and had been asked for their opinion, they would probably have said that the best teaching is when one teaches in front of the classroom through the textbooks [28]. The group of technologically competent teachers and those who had already had their materials on online platforms were ready to assist and consult those who wanted to overcome technical barriers.

The survey unveiled that only 4 teachers used Moodle before the closure of the University for uploading their lectures or presentations. Then the respondents were asked about the type of software they used to teach digitally and if they taught synchronously or asynchronously. About 70% taught in real-time, other 30% asynchronously via social networks, email, and messengers. The most popular platforms were Zoom, Google Classroom, Discord, Moodle, Skype, and BigBlueButton (see Fig. 2).

Some respondents used more than one platform; it depended on the aims of the course and the group of students they were teaching. The majority of teachers used Skype which had proved itself as reliable software for business conferences, despite the Zoom’s boom; rather behind them were Google Classroom and Discord. Google Classroom is a very convenient free service for those teachers who want to have all the material in one place, streamline assignments, give feedback to students, and interact with them individually. Classroom keeps students’ works; automatically creates a chart with their grades which tremendously facilitates teachers’ work. Discord is also free software, a messenger for easy communication which is not aimed at the academic environment, in our opinion. Its choice was likely based on students’ preferences and familiarity with this program. BigBlueButton had only 1% of users which is surprising as it is the official platform of the University. Other programs included Hangouts, VKontakte, Jitsi, and email. Hangouts is a service for video conferences and communication which has a significant drawback as it limits the number of a group to only 10 people. VKontakte is a Russian social network similar to Facebook. Jitsi is a free video-conferencing service that is available on laptops and mobile phones. The email was used by the group “over 60” for giving assignments and feedback on them.

The survey exposed some positive and negative attitudes toward teaching exclusively online. Table 1 presents what teachers wrote about the advantages and challenges in free-text answers.

The teachers were also asked to evaluate their experience of using MOOCs. The majority of the teachers (71%) could not find the course suitable for their program; others (10%) said that they found the course, but it needed adaptation; some could not find the time to browse MOOCs (6%). However, there were a few lecturers (13%) who adapted a free English language course and developed evaluation criteria to monitor students’ progress.

To conclude, the study revealed that not all academic staff demonstrated a favorable attitude to online teaching; there were considerable challenges to respond to. 4% of the teachers said that they did not see any advantages of changing the mode of education from in-class to online. However, about 70% of the teachers turned to synchronous delivery of their material and embraced new challenges – they self-educated in technical programs and online teaching methodology and inspired their colleagues to do the same. The remained 26% were more focused on challenges and looked forward to returning to the classrooms.
5 Conclusion

The study was aimed at examining the experience of the academic staff at two big Russian Universities (RUDN and PNRPU) within two months of teaching online. The specific aim was to compare the experiences of the academic staff and to decide if teachers faced the same or different challenges.

We understand that the survey data was rather small, limited to 76 respondents (42 from RUDN and 34 from PNRPU); so, it does not allow making general conclusions or recommendations. The study gives the first insight into the situation when the Russian higher education system was forced to change almost overnight and how it responded to that challenge.

No strong evidence was found that RUDN as the university situated in Moscow met a rapid transition to teaching exclusively online head-on. The advantage was that the University provided the academic staff with Microsoft platform and gave a webinar on how to use it. It enabled over 40% of the staff to deliver their teaching on MS Teams. However, due to the absence of prior experience, the teachers needed a more comprehensive training program about the features of the platform and pedagogic support on how to transform their programs into online mode. The academic staff at PNRPU found themselves in the situation when they had to rely on their technical expertise and intuition about which online service to choose and how to use it. Not surprisingly, only 1% of the teachers used BigBlueButton - an official university platform, others resorted to Skype (59%) and Zoom (50%).

This highlights that if a university wants to gain a competitive edge in the future, it should organize sustained training programs that will help its academic staff acquire digital competence and confidence; develop a strategy to train the staff in pedagogical online

| Positive aspects | Challenges |
|------------------|------------|
| 1. Possibility to improve teachers’ technical skills | 1. Technical reasons: the absence of Internet coverage, poor Internet connection; technical characteristics of computers and mobile phones; |
| 2. Better visualization of material; | 2. The increased amount of work: to find materials and plan lessons |
| 3. Mobility (one can teach from any place provided they have internet access); | 3. Adapting existing materials to online mode |
| 4. Students’ self-development; | 4. Absenteeism of students in virtual classrooms |
| 5. Individual approach to every student; | 5. Students’ reluctance to participate in online discussions |
| 6. A way to study during epidemics; | 6. Online communication cannot replace personal contacts in class |
| 7. Time-saving - no commuting; | 7. Spending too much time in front of a computer screen |
| 8. Easier to correct home assignments; | 8. Physically and mentally demanding for teachers |
| 9. New formats of teaching; | |
| 10. Good for students to learn new skills; | |
| 11. Excellent for giving creative group assignments | |

Table 1. Positive aspects and challenges of teaching exclusively online
expertise; organize in-house (online) workshops or chatrooms where professors and lecturers can share experience, exchange ideas and educate each other on best practices.

Another finding of the survey was about teachers’ preparedness for online delivery which resulted in consequential positive or negative attitudes to it. A geographical location of a university does not have any influence on one’s attitude to the teaching mode. Even for those with a positive feeling, it was challenging and demanding. It is quite understandable; in such an emergency they did not have a choice but had to adjust to online methods in haste. However, the silver linen is that the transition triggered creativity, experiment, and desire to master new technical and pedagogical skills. Now all teachers have to revise their teaching methods, give honest feedback on their strengths and weaknesses, and bridge the gap in digital knowledge at webinars and teachers’ forums. “Learning anywhere, anytime” concept should become a habit integrated into daily life – a true lifestyle.

We are aware that our research may have limitations. The first is the rather small scope of data. It would be beneficial to conduct a further study on a bigger number of participants, e.g. include professors from technical departments and discover their attitudes to online teaching. The second, new research should dig deeper into professors’ negative experiences and feedback on current teaching. The results should be reported to the university administration that has power and financial resources to address the problems and solve them. The third is the absence of students’ opinions; the research did not include a questionnaire of students’ impressions about online learning.

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