INSTITUTIONAL AND NATIONAL CHALLENGES OF TEACHER EDUCATION IN THE CONTEXT OF THE COVID-19 PANDEMIC

AUTHORSHIP

Iryna Dorozh 🆔

The candidate of pedagogical sciences, Senior Lectur, theory and methods of primary education department, Kamyanets-Podilsky Ivan Ohienko National University.

ORCID:https://orcid.org/0000-0003-4792-7025
E-mail: dorozhira@kpnu.edu.ua

Oksana Bielykh 🆔

Doctor of Pholosophy, Ph.D., associate professor, Language and literature (German), Lesya Ukrainka Volyn National University.

ORCID: https://orcid.org/0000-0002-1167-0224
E-mail: bielykh.oksana@ukr.net

Lyudmyla Blyznyuk 🆔

Doctor of Philosophy, Ph.D, associate professor, Language and literature (German), Lesya Ukrainka Volyn National University.

ORCID: https://orcid.org/0000-0002-0795-6254
E-mail: luda_blysnjuk@ukr.net

Lidiia Tovkun 🆔

Candidate of Historical Sciences, Assistant Professor of the Department of Medical and Biological Disciplines and Valeology, Hryhorii Scovoroda University in Pereiaslav.

ORCID: https://orcid.org/0000-0002-4091-1322
E-mail: tovkynlidiya@ukr.net

Nadiia Kotsur 🆔

Doctor of Historical Sciences, professor, Head of Department of Medical and Biological Disciplines and Valeology, Hryhorii Skovoroda University in Pereiaslav.

ORCID: https://orcid.org/0000-0003-4720-2227
E-mail: n.kozur@ukr.net

INTRODUCTION

The COVID-19 pandemic has had different effects on education and, in particular, on teacher education. Due to the closure of universities and schools, teachers and students had to adapt quickly to distance learning, where teacher education is no exception. The need to create a learning environment for student teachers involved the adoption, selection and adaptation of decisions to meet not only the expectations of students, but also the requirements for quality teacher training, as well as to create conditions under which both universities and schools will operate (FLORES and GAGO, 2020).

The pandemic has provoked changes in the educational process and has affected the communicative interaction of students and teachers, students and teachers; as a result, educational institutions secure their activities through the Internet (SOBAIH, HASANEIN, ABU ELNASR, 2020). Governments around the world have implemented measures to avoid the spread of COVID-19, to ensure a smooth educational process, and therefore, educational institutions implement distance learning (Ali, 2020), which at this stage is a substitute for the traditional educational process (ABOU EL-SEOUD et al., 2014). Innovative information technologies simplify the process of dissemination of pedagogical material to ensure the learning process at the same time among a significant number of students, so e-learning platforms provide a significant number of benefits, namely checking the educational process, monitoring the time spent on the learning process, thanks to the learning platform can be adapted to the demands and purpose of learning (SURESH, PRIYA, GAYATHRI, 2018).

The rapid, unexpected and "forced" transition to distance learning has caused a number of problems and limitations, as well as created opportunities to be explored (CARMEN and FLORES, 2020). The existing literature points to "emergency distance learning" (BOZKURT and SHARMA, 2020) or "emergency e-learning" (MURPHY, 2020) and to difficulties related to poor online teaching infrastructure, inexperience of teachers, information gap (i.e. limited information) and resources for all students) and a challenging home learning environment (ZHANG et al., 2020). In addition, there was also a lack of mentoring and support (Judd et al., 2020) as well as problems related to the competence of teachers in the use of digital learning formats (HUBER and HELM, 2020).

However, using digital learning formats, there are some structural components that are obstacles in the process of providing emergency distance learning, namely: feelings of isolation due to lack of face-to-face presence of classmates, decreased motivation, slow feedback, in case of urgent quests during the task (Yusuf, Al-Banawi, 2013). These barriers can be addressed through the effective work of teachers who have adapted learning strategies to the requirements of students (COMAN et al. 2020).

The aim of the study is to establish a pattern for establishing institutional and national challenges for teacher education in the context of the COVID-19 pandemic, by conducting

regression analysis and research of regulations of the world, to identify challenges for teacher education and the ability to provide quality education in the context of distance learning.

Research objectives of the article

1. Analyze regulations to determine, institutional and national challenges, and teacher education requirements in the context of the COVID-19 pandemic.

2. Analyze the current state of high-speed broadband Internet access in 30 countries, as well as determine the speed of mobile Internet and provide an assessment of the climate of distance education.

3. Identify some signs of the first attempts to curb the spread of the virus and establish the impact of the COVID-19 pandemic on the activities of educational institutions.

4. Analyze statistical information on the introduction by countries and regions of blocking and closing of educational institutions.

5. Conduct a regression analysis to reflect the dependence of the availability of emergency distance education in 30 countries, based on the results of access to personal computers among students and the current cost of education.

LITERATURE REVIEW

At such a critical time, there have been dramatic changes in the way the teaching and learning process takes place, when students are physically out of school and separated from their teachers. The learning process during the COVID-19 pandemic is denoted by different terms in different countries (e.g., distance education, e-learning, online education, home schooling, etc.). However, these terms do not quite cover what is practiced during the interruption of training, which can best be described as emergency distance learning. Given that the terms used in different countries are derived from distance education as a general concept, the remarkable difference between emergency distance education and distance education is that the latter is an option and the former-duty. For example, distance education is a planned activity, and its implementation is based on theoretical and practical knowledge that is specific to the industry and its nature. On the other hand, emergency distance education– it is survival in times of crisis with all available resources, including offline tools and/or the Internet.

Distance learning is defined as "a learning process in which all or most of the teaching is conducted by someone remote in space and/or time from the learner, with the result that all or most of the communication between teachers and students takes place via artificial media, electronic or printed" (UNESCO, 2002). The field of distance education has already proved its validity and value (XIAO, 2018), and previous studies have shown that there is no difference between distance education and full-time education. Contrary to widely known assumptions, distance education is not specifically about online education, but about a wide range of technologies used during the learning process (BOZKURT, 2019a; JUNG, 2019). The pragmatic nature of distance education allows the industry to use work solutions for learners, and argues that the industry should provide educational opportunities for those with disabilities (BOZKURT, 2019b).

Although in the field of distance education, the World Bank (2020a) emphasizes that in the implementation of emergency distance education, "failures are common, and success is often the result of experience and the study of past failures". The World Bank (2020b) states, "Education systems must address injustices; first and foremost, they must prepare multimodal responses, using existing infrastructure and a combination of different learning tools to engage students. Although digital technologies can offer a wide range of opportunities for distance learning, most education systems in low- and middle-income countries, including schools, children and teachers, do not have access to high-speed broadband or digital devices, which are necessary for the full conduct of the educational process on the Internet. Thus, education systems should consider alternative ways of continuing education when they are unable to carry out the traditional learning process, as in the current COVID-19 crisis. In this regard, it can be argued that during the COVID-19 pandemic, having similarities and differences (BOZKURT, & SHARMA, 2020; HODGES et al., 2020; TZIFOPOULOS, 2020), the emergency

distance learning that was used can be argued that it is a field of distance learning, as in the case of online learning, e-learning or home learning (BOZKURT, 2020).

The need to quickly adapt to new online teaching and learning contexts has shown how educational institutions and teachers face challenges and opportunities to continue their work in such unexpected circumstances (Flores and Gago, 2020; Nasri et al., 2020; Quezada, Talbot and Quezada- Parker, 2020). In this context, it is important, among other issues, to look at how teacher education has adapted to the constraints of interaction and moved to new ways of teaching and learning in the training of future teachers, which is characterized by uncertainty. The reality of the COVID-19 crisis raises questions about the nature of teaching and how to support student-teacher learning, but it also raises the opportunity for teacher education to consider ways to re-educate teachers in unpredictable and scenarios (FLORES and SWENNEN, 2020).

The study by La Velle et al. (2020) in England, Donitsa-Schmidt and Ramot (2020) in Israel and Van Nulandetc in Canada (2020) focuses on the necessary changes at the national level of teacher education. Flores and Gago (2020) in Portugal and Robinson and Rusznyak (2020) in South Africa discuss the importance of the workshop in teacher education, identifying issues around its importance in the usual forms and the concept of idealizing practice (Flores and Gago, 2020). Other studies specifically consider replacing the workshop, either in terms of quality issues (Moyo, 2020) or alternative strategies for studying the lost workshop (FERDIG et al., 2020). Thus, the institutional and national challenges of teacher education in the context of the COVID-19 pandemic are not reflected in the publications of scientists in the form of practical research and theoretical research, but the issue is relevant and open for further research.

METHODS AND MATERIALS

The realization of the purpose of this exploration involves the involvement of such research methods as:

- systematization of regulations to determine and institutional and national challenges and teacher education requirements in the context of the COVID-19 pandemic;

- system and logical analysis, method of information synthesis;

- summarizing statistics published by governments and reporting organizations to assess the climate of distance education in 30 countries, as well as analyzing the current state of high-speed broadband Internet access and mobile Internet speed in the analyzed countries, based on the Speedtest Global Index 2020, and statistics The World Bank Group for 2020.

To identify some signs of the first attempts to curb the spread of the virus, a method was used to compare statistics on countries 'and regions' blockades and closures, which established the impact of the COVID-19 pandemic on educational institutions. To display the availability dependency emergency distance education in 30 countries based on the results of access to personal computers among students and the current cost of education, regression analysis was applied.

RESULTS

In their first attempts to curb the spread of the virus, many countries imposed blockades, and schools and universities closed for several months in all OECD countries and partner countries. Of the 38 OECD countries and 8 partner countries covered by the program "Education at a Glance 2020", the People's Republic of China was the first to close schools in response to the COVID-19 pandemic, and other countries also began closing schools as the pandemic expanded. By the end of March, school closures were to some extent in all 46 countries covered by the system "Education at a Glance 2020", with varying degrees: 41 countries closed schools across the country, while 5 (Australia, Iceland, the Russian Federation, Sweden and the United States) closed them at the subnational or local level (see Figure 1). However, not all countries affected by the pandemic have closed all their schools. For example, primary schools

in Iceland remained open if class sizes were less than 20 students. In Sweden, most primary and lower secondary schools remained open, while upper secondary schools switched to mostly distance learning in mid-March (UNESCO, 2020).

Figure 1. Number of countries with school closures due to COVID-19 (17 February 2020 and 30 June 2020)
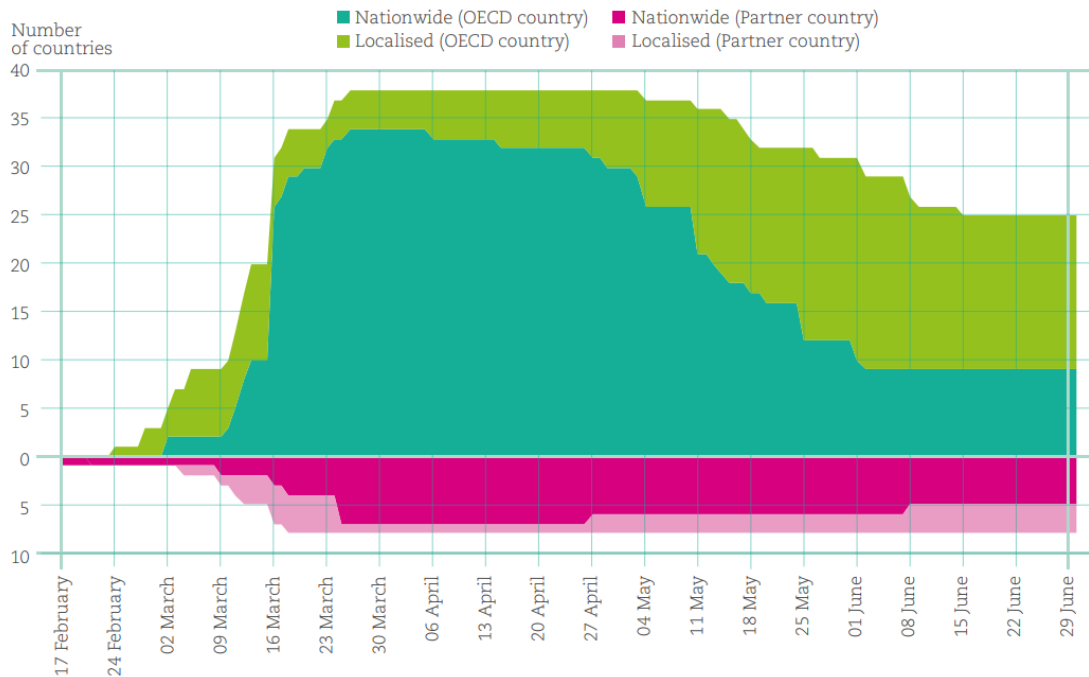
Source: Compiled by the authors based on official data of UNESCO (2020), the impact of COVID-19 on education (2020).

Table 1 clearly shows that the percentage of schools that have been canceled is very low in all regions except Africa, where it is currently 24%.

Table 1. Impact on teaching and learning by region

	Not affected	Classroom teaching replaced by distance teaching and learning	Teaching suspended but the institutions is developing solutions	Teaching canceled
Africa	3%	29%	43%	24%
Americas	3%	72%	22%	3%
Asia & Pacific	1%	60%	36%	3%
Europe	Almost zero	85%	12%	3%

Source: Compiled by the authors based on official data of IAU Global Survey Report (2020).
Africa is also the only region where teaching has been suspended or canceled in most schools.

Only 29% of African schools were able to move teaching and learning online quickly, compared to 85% of European schools. Two-thirds of African schools were not ready to transfer teaching online, and when they closed their educational institutions, they had to stop, but there is a quarter of African schools where teaching is completely canceled. If this situation lasts for a long time, it will have a serious negative impact on students' learning opportunities.

In almost all schools, the COVID-19 pandemic affected learning, and only 2% of schools reported that the pandemic did not affect learning. Two-thirds of schools reported that classroom teaching had been replaced by distance learning, and one-quarter that most activities were now discontinued, but the institution was working to develop solutions for continuing education using digital tools or special self-study methods. Only 7% reported that teaching was discontinued (see Figure 2).

Figure 2. How has COVID-19 affected teaching and learning?
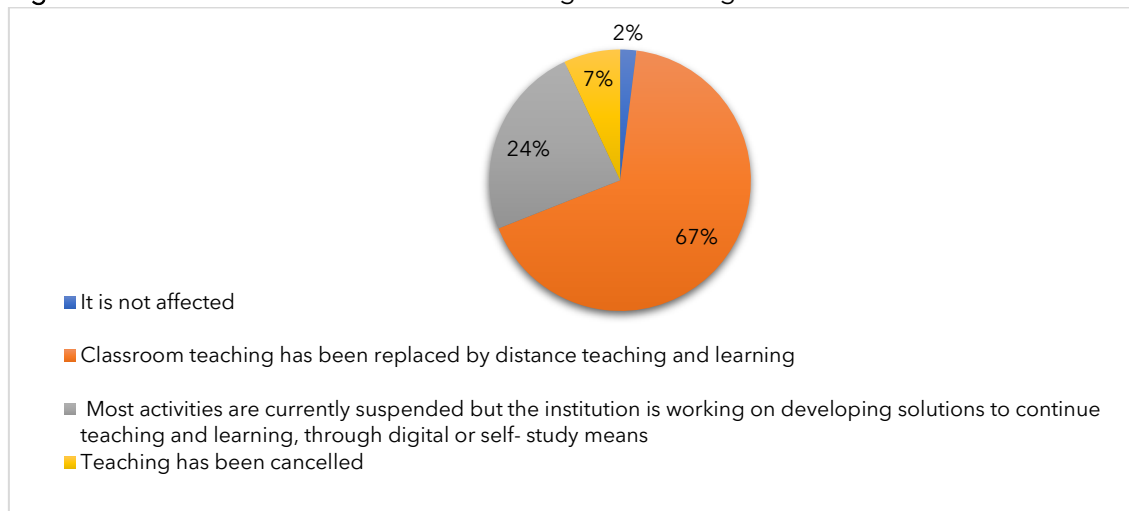
Source: Compiled by the authors based on official data of IAU Global Survey Report (2020).

These results show that two-thirds of educational institutions were able to transfer teaching online and one-third – no. However, most educational institutions are working to develop solutions to continue teaching online (IAU GLOBAL SURVEY REPORT, 2020). Table 2 shows the results of regression modeling to establish the availability dependence emergency distance education in 30 countries (listed in Table 3), based on the results of access to personal computers among education seekers (OECD Data, 2020) and current expenditures on education (OECD statistics, 2020):

$$Accessibility\ to\ online\ education = (-2,13) + 102,13 * Access\ to\ computers + 86,21 * Education\ expenditure$$

Hence, the availability emergency distance education in 30 countries depends on access to personal computers among students and the current cost of education. The model parameters are statistically significant, as indicated by t Stat in size17.82 and 10.54 and a P-value in size 0,000000000000000081 and 0,00000000003.

Table 2. The results of regression modeling

Regression Statistics								
Multiple R	0.78							
R Square	0.61							
Adjusted R Square	0.60							
Standard Error	15.30							
Observations	30							
ANOVA								
	df	SS	MS		F		Significance F	
Regression	1	10215.05	10215.05		43.63		0,00000036	
Residual	28	6556.18	234.15					
Total	29	16771.23						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-2.13	0.32	-6.61	0,00000037	-2.79	-1.47	-2.79	-1.47
Access to computers	102.13	5.73	17.82	0,000000000000000081	90.40	113.87	90.40	113.87
Education expenditure	86.21	8.18	10.54	0,00000000003	69.46	102.97	69.46	102.97

Source: Compiled by the authors based on official data of OECD Data (2020), UNESCO Institute for Statistics (2020).

The value of the coefficient of determination indicates that 60% regression model reflects the direct dependence of the availability of emergency distance education in 30 countries, based on the results of access to personal computers among students and the current cost of

education. This analysis indicates that there are many other factors influencing accessibility emergency distance education in 30 countries, which are not included in the regression model. To implement emergency distance education requires high-speed broadband Internet access, mobile Internet, a favorable climate of online education. High-speed broadband Internet access is available in Switzerland, Sweden, the United States, France and Spain, and high-speed mobile Internet is available in the Netherlands, Canada, Australia, Norway and Switzerland. Countries such as Denmark, Switzerland, Austria, Norway and Luxembourg have a favorable climate for emergency distance education (see Figure 3).

Figure 3. Statistics of availability on the Internet TOP-30 countries of the world
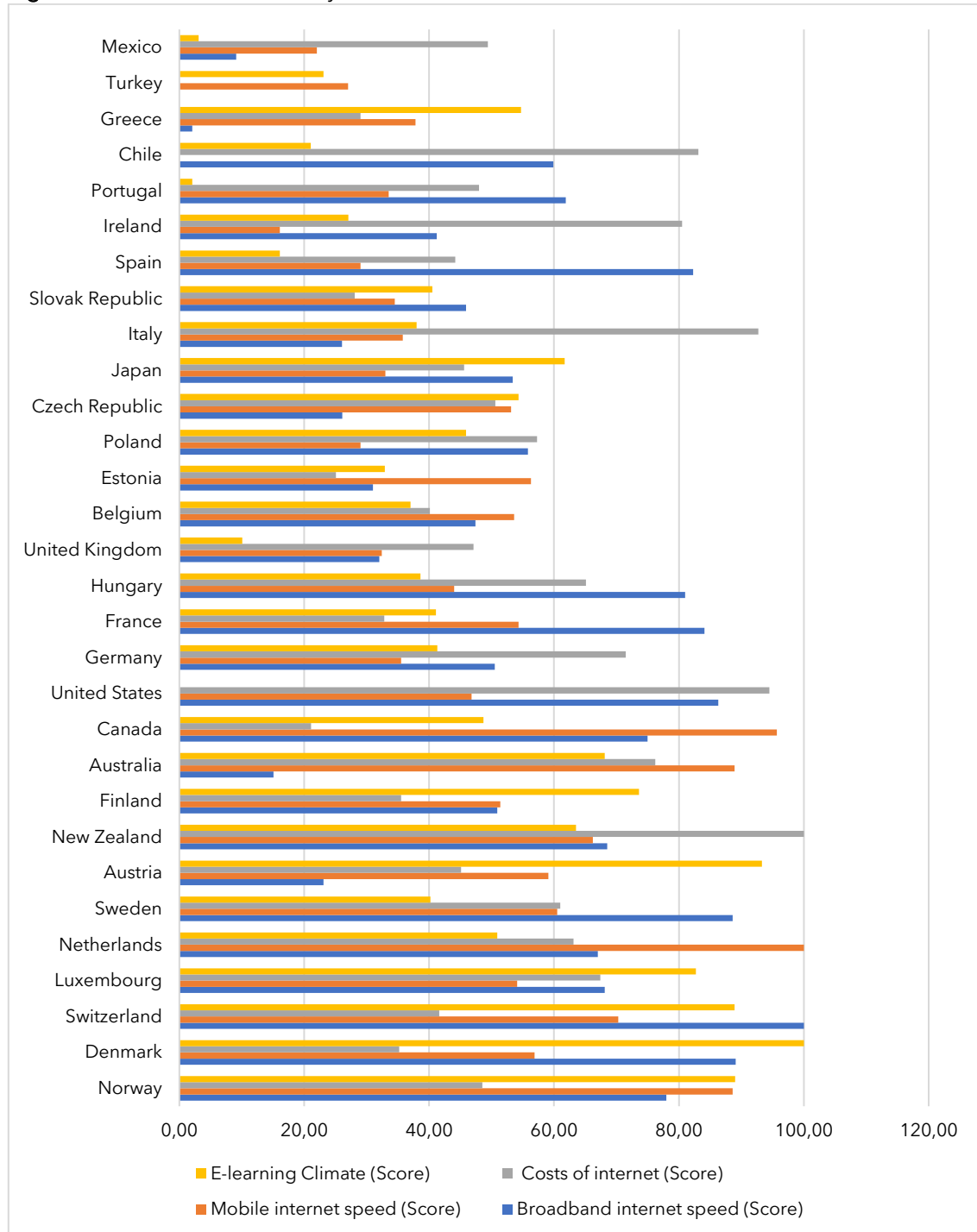
Source: Compiled by the authors based on official data of Speedtest Global Index (2020), The World Bank Group (2020).

Teachers also identified the main difficulties they faced: lack of proper technical support for students, poor student involvement, lack of time, lack of proper online teaching training, lack of parental support, and reduced student participation in the learning process that contributes to widening the gap in terms of students' learning opportunities due to the lack of appropriate conditions in their homes (see Figure 4).

Figure 4. Institutional and national challenges and requirements for teacher education in the context of the COVID-19 pandemic
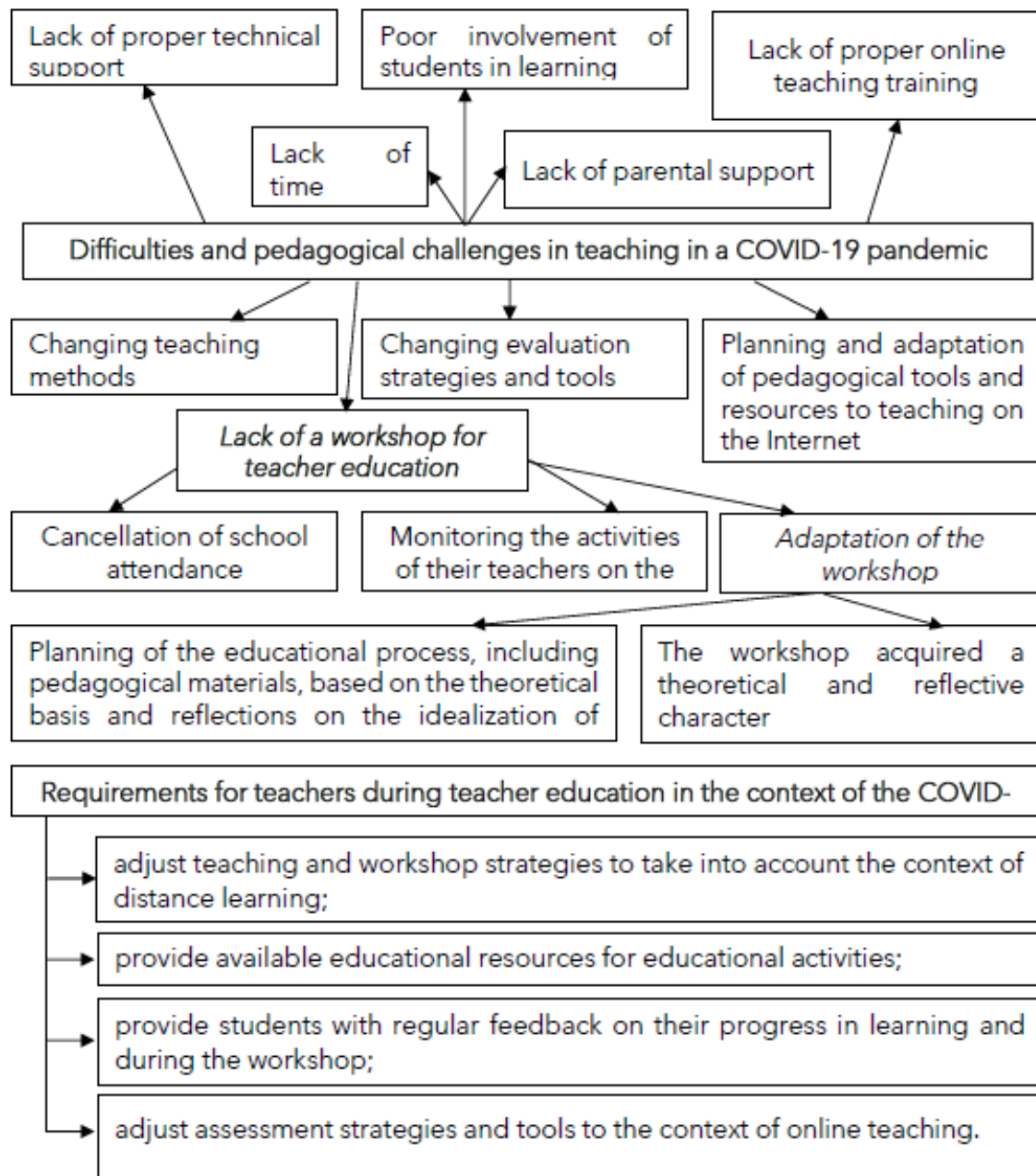
Source: Compiled by the authors based on official data of IE (2020), RT-33 (2020).

DISCUSSION

The COVID-19 pandemic has exacerbated digital inequality and has had an additional impact in terms of social support networks, which are so important for maintaining interpersonal connections and social structures (BEAUNOYER, DUPÉRÉ and GUITTON, 2020). This study has several implications for teacher education.

Firstly, it emphasizes the need to go beyond emergency online practices to provide an evidence-based approach to online teaching and learning that recognize pedagogical features and implications.

Secondly, it emphasizes the need for a pedagogical approach that relies heavily on the social and shared components of learning as a starting point for the development of online teaching and learning practices (OLOFSSON, 2007), as well as educational support structures in partnership with governments and organizations to achieve justice and equality for all students. Thus, it is important to minimize the factors that may contribute to inequality and to maximize student participation in their learning process. Such factors include issues related to access to technology, but also issues related to pedagogical approaches (e.g., clear goal setting, consistent and flexible design, clear objectives, consistent and clear monitoring and evaluation) and different levels of interaction.

Thirdly, it emphasizes the different nature of the roles and competencies needed for effective teaching in the online environment (NÍ SHÉ et al., 2019), and at the same time makes it clear that teachers need to be equipped with a set of competencies in which socio-effective– is the main essence.

Finally, it is necessary to go beyond the instrumental approach to teaching and learning on the Internet and to include in the equation its ethical, political and pedagogical dimensions. Thus, teachers and students will face new challenges, as the potential of distance education in the educational information technology space is quite high, but not sufficiently implemented, in-depth research, which will lead to increased attention to improving teacher education.

CONCLUSION

An analysis of the institutional and national challenges of teacher education in the context of the COVID-19 pandemic found that due to the intensification of educational processes and the emergence of barriers to traditional learning that require immediate alternative solutions, this process requires the development of distance education, where this topic is becoming increasingly relevant. It is established that in connection with the pandemic, distance education is gaining popularity in almost all countries.

The closure of schools through COVID-19 and the haste to distance learning and training have highlighted the need for teachers and schools to be flexible, adaptable and responsive to unforeseen circumstances. Moving towards a more democratic and inclusive learning process that enables teachers to work from their rights and the rights of their students, we believe that this should be an important element of teacher education in the twenty-first century. Such a change requires a transition to a more emancipatory basis of the philosophy of teacher education, which may oppose the pedagogy of the modern technical paradigm.

At this stage, it is necessary to think about the existing goals of the teacher education program and ensure the appropriate quality and relevance of learning outcomes. It is now quite obvious that in order to achieve an effective learning process, educational institutions must combine the benefits of mixed types of education, which can help achieve an optimal balance. In addition, the study assessed and identified institutional and national challenges for teacher education, and it is expected that addressing these issues will help improve the quality of teacher education. It is also particularly important to improve distance education platforms, which may be the only available way of learning and teaching that can ensure continuity of learning during unexpected events, such as the COVID-19 outbreak.

The practical significance of the study is that the conclusions and recommendations developed by the author and proposed in the article can be used to: avoid the institutional and national challenges of teacher education in the context of the COVID-19 pandemic.

Further research can be aimed at improving distance education of teachers, which will stimulate the educational sphere and improve teaching in the educational information technology area, which will provide quality education. Empowerment and the widespread use of innovative, research-based approaches and the avoidance of institutional and national challenges to teacher education cannot be the basis for future strategies.

REFERENCES

ABOU EL-SEOUD, S.et al. E-Learning and Students' Motivation: A Research Study on the Effect of E-Learning on Higher Education. *Int. J. Emerg. Technol. Learn.*, 2014, 9, 689–695.

ALI, W. Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 Pandemic. *High. Educ. Stud.* 2020, 10, 16–25.

BEAUNOYER, E., S. DUPÉRÉ, and M. J. GUITTON. COVID-19 and Digital Inequalities: Reciprocal Impacts and Mitigation Strategies. *Computers in Human Behavior*, 2020, 111: 106424.

BOZKURT, A. A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education,* 2020, 1-126.

BOZKURT, A. and R. SHARMA, C. Emergency Remote Teaching in a Time of Global Crisis Due to Coronavirus Pandemic. *Asian Journal of Distance Education*, 2020, 15 (1): i–vi. Available at: http://asianjde.org/ojs/index.php/AsianJDE/article/view/447.Access. Access: March 21, 2021.

BOZKURT, A. From distance education to open and distance learning: A holistic evaluation of history, definitions, and theories. In SISMAN-UGUR, S. & KURUBACAK, G. (Eds.), *Handbook of research on learning in the age of transhumanism* (p. 252-273). Hershey, PA: IGI Global, 2019a. Available at: https://doi.org/10.4018/978-1-5225-8431-5.ch016. Access: March 21, 2021.

BOZKURT, A. Intellectual roots of distance education: a progressive knowledge domain analysis. *Distance Education,* 2019b, 40(4), 497-514. Available at: https://doi.org/10.1080/01587919.2019.1681894. Access: March 21, 2021.

BOZKURT, A., & SHARMA, R. C. Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education,* 2020, 15(1), i-vi. Available at: https://doi.org/10.5281/zenodo.3778083. Access: March 21, 2021.

Carrillo, C, & FLORES, M.A. COVID-19 and teacher education: a literature review of online teaching and learning practices, *European Journal of Teacher Education,* 2020, 43:4, 466-487.

COMAN, C. et al. Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, 2020, *12*, 10367. Available at: https://doi.org/10.3390/su122410367. Access: March 21, 2021.

DONITSA-SCHMIDT, S., and RAMOT, R. Opportunities and Challenges: Teacher Education in Israel in the Covid-19 Pandemic. *Journal of Education for Teaching,* 2020, 1–10. doi:10.1080/02607476.2020.1799708.

FERDIG, R.; BAUMGARTNER, E.; HARTSHORNE, R.; KAPLAN-RAKOWSKI, R. AND MOUZA, C. eds. (). Teaching, Technology, and Teacher Education during the COVID-19 Pandemic: Stories from the Field. Association for the Advancement of Computing in Education (AACE), 2020. Available at: https://www.learntechlib.org/p/216903/ Access: March 21, 2021.

FLORES, M. A., AND GAGO, M. (). Teacher Education in Times of COVID-19 Pandemic in Portugal: National, Institutional and Pedagogical Responses. Jo*urnal of Education for Teaching, Advance online publication,* 2020.

FLORES, M.A. & SWENNEN, A. The COVID-19 pandemic and its effects on teacher education, *European Journal of Teacher Education,* 2020, 43:4, 453-456, DOI: 10.1080/02619768.2020.1824253.

HODGES, C.; MOORE, S.; LOCKEE, B.; TRUST, T. & BOND, A. The Difference Between Emergency Remote Teaching and Online Learning. *EDUCAUSE Review,* 2020. Available at: https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teachingand-online-learning. Access: March 21, 2021.

HUBER, S. G. AND HELM, C. COVID-19 and Schooling: Evaluation, Assessment and Accountability in Times of Crises–reacting Quickly to Explore Key Issues for Policy, Practice and Research with the School Barometer. *Educational Assessment, Evaluation and Accountability*, 2020, 32: 237–270.

IAU GLOBAL SURVEY REPORT. The impact of COVID-19 on higher education around the world, 2020. Available at: https://www.iau-aiu.net/IMG/pdf/iau_covid19_and_he_survey_report_final_may_2020.pdf. Access: March 21, 2021.

IE. Normas De Funcionamento Excecional Do Estágio Dos Mestrados Em Ensino Da Universidade Do Minho Em 2019–20. Braga: Universidade do Minho, 2020.

JUDD, J.; REMBER, B. A.; PELLEGRINI, T.; LUDLOW, B. and MEISNER, J. this is not teaching: the effects of COVID-19 on teachers, 2020. Available at: https://www.socialpublishersfoundation.org/knowledge_base/this-is-not-teaching-the effects-of-covid-19-on-teachers/. Access: March 21, 2021.

JUNG, I. Introduction to theories of open and distance education. In Insung Jung (Ed.), Open and distance theory revisited: Implications for the digital era (pp. 1-9). Singapore: Springer, 2019. Available at: https://doi.org/10.1007/978-981-13-7740-2_1. Access: March 21, 2021.

LA VELLE, L.; NEWMAN, S.; MONTGOMERY, C. and HYATT, D. Initial Teacher Education in England and the Covid-19 Pandemic: Challenges and Opportunities. *Journal of Education for Teaching.* 2020, 1–13. doi:10.1080/02607476.2020.1803051.

MOYO, N. COVID-19 and the Future of Practicum in Teacher Education in Zimbabwe: Rethinking the 'New Normal' in Quality Assurance for Teacher Certification. *Journal of Education for Teaching.* 2020, 1–10. doi:10.1080/ 02607476.2020.1802702.

MURPHY, M. P. A. COVID-19 and Emergency eLearning: Consequences of the Securitization of Higher Education for Post-pandemic Pedagogy. *Contemporary Security Policy*, 2020, 41 (3): 492–505. doi:10.1080/13523260.2020.1761749.

NASRI, N. M.; HUSNIN, H.; MAHMUD, S. N. D. and HALIM, L. Mitigating the COVID-19 Pandemic: A Snapshot from Malaysia into the Coping Strategies for Pre-service Teachers' Education. *Journal of Education for Teaching,* 2020.

Ní Shé, C. et al. Teaching Online Is Different: Critical Perspectives from the Literature. Project Report. Dublin: Dublin City University, 2019.

OECD Data. Access to computers from home, 2020. Available at: https://data.oecd.org/ict/access-to-computers-from-home.htm. Access: March 21, 2021.

OLOFSSON, A. D. Participation in an Educational Learning Community. *Educational Technology & Society*, 2007, 10 (4): 28–38.

QUEZADA, R. L.; TALBOT, C. and QUEZADA-PARKER, K. B. From Bricks and Mortar to Remote Teaching: A Teacher Education Programme's Response to COVID-19. *Journal of Education for Teaching,* 2020.

ROBINSON, M. and RUSZNYAK, L. Learning to Teach without School-based Experience: Conundrums and Possibilities in a South African Context. *Journal of Education for Teaching,* 2020, 1–11.

RT-33. Despacho RT-33/2020. Braga: Reitoria da Universidade do Minho, 2020. Available at: https://www.uminho.pt/PT/viver/COVID-19/Paginas/DespachosCirculares.aspx. Access: March 21, 2021.

SOBAIH, A.E.E.; HASANEIN, A.M.; ABU ELNASR, A.E. Responses to COVID-19 in Higher Education: Social Media Usage for Sustaining Formal Academic Communication in Developing Countries. *Sustainability,* 2020, 12, 6520.

SPEEDTEST GLOBAL INDEX, 2020. Available at: https://www.speedtest.net/global-index. Access: March 21, 2021.

SURESH, M.; PRIYA, V.V.; GAYATHRI, R. Effect of e-learning on academic performance of undergraduate students. *Drug Invent. Today*, 2018, 10, 1797–1800.

THE IMPACT OF COVID-19 ON EDUCATION. Insights from Education at a Glance 2020. Available at: https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance-2020.pdf. Access: March 21, 2021.

THE WORLD BANK . Remote Learning and COVID-19: The use of educational technologies at scale across an education system as a result of massive school closings in response to the COVID-19 pandemic to enable distance education and online learning, 2020a. Available at: http://documents.worldbank.org/curated/en/266811584657843186/pdf/Rapid-ResponseBriefing-Note-Remote-Learning-and-COVID-19-Outbreak.pdf. Access: March 21, 2021.

THE WORLD BANK GROUP, 2020. Available at: https://olc.worldbank.org/. Access: March 21, 2021.

THE WORLD BANK. Guidance Note: Remote Learning & COVID-19, 2020b. Available at: http://documents.worldbank.org/curated/en/531681585957264427/pdf/Guidance-Note-onRemote-Learning-and-COVID-19.pdf. Access: March 21, 2021.

TZIFOPOULOS, M. In the shadow of Coronavirus: Distance education and digital literacy skills in Greece. *International Journal of Social Science and Technology,* 2020, 5(2), 1-14. http://www.ijsstr.com/data/frontImages/1._April_2020.pdf. Access: March 21, 2021.

UNESCO Institute for Statistics. (). Government expenditure per student, tertiary (% of GDP per capita), 2020. Available at: http://uis.unesco.org/en/topic/education-finance/. Access: March 21, 2021.

UNESCO. COVID-19 educational disruption and response, 2020. Available at: https://en.unesco.org/covid19/educationresponse. Access: March 21, 2021.

UNESCO. Open and Distance Learning: trends, policy and strategy consideration. UNESCO, 2002.

Van Nuland, S. et al. COVID-19 and Its Effects on Teacher Education in Ontario: A Complex Adaptive Systems Perspective. *Journal of Education for Teaching,* 2020, 1–10. doi:10.1080/02607476.2020.1803050.

XIAO, J. On the margins or at the center? Distance education in higher education. Distance Education, 2018, 39(2), 259-274. Available at: https://doi.org/10.1080/01587919.2018.1429213. Access: March 21, 2021.

YUSUF, N.; AL-BANAWI, N. The Impact of Changing Technology: The Case of E-Learning. *Contemp. Issues Educ. Res.* 2013, 6, 173–180.

ZHANG, W. et al. Suspending Classes without Stopping Learning: China's Education Emergency Management Policy in the COVID-10 Outbreak. *Journal of Risk and Financial Management*, 2020, 13 (58): 1–6. Available at: https://www.mdpi.com/1911-8074/13/3/55. Access: March 25, 2021.

Institutional and national challenges of teacher education in the context of the COVID-19 pandemic

Desafios institucionais e nacionais da formação docente no contexto da pandemia COVID-19

Desafíos institucionales y nacionales de la formación docente en el contexto de la pandemia de COVID-19

Resumo

O objetivo do estudo é estabelecer o padrão de desafios institucionais e nacionais para a formação docente no contexto da pandemia COVID-19, realizando análises de regressão e pesquisa de regulamentações do mundo, para identificar desafios para a formação docente e a capacidade de proporcionar educação de qualidade no contexto do ensino a distância. Métodos de pesquisa: sistematização; análise comparativa; generalização; análise de regressão. Resultados. Após a realização de uma análise de regressão, verificou-se que o valor do coeficiente de determinação mostra que o modelo de regressão em 60% reflete a dependência direta da disponibilidade de educação a distância emergencial em 30 países, com base nos resultados do acesso a computadores pessoais entre os alunos e do custo atual da educação. Foi estabelecido que países como Dinamarca, Suíça, Áustria, Noruega e Luxemburgo têm um clima favorável para a educação a distância de emergência.

Abstract

The purpose of the study is to establish the pattern of institutional and national challenges for teacher education in the context of the COVID-19 pandemic, by conducting regression analysis and research of regulations of the world, to identify challenges for teacher education and the ability to provide quality education in the context of distance learning. Research methods: systematization; comparative analysis; generalization; regression analysis. Results. After conducting a regression analysis, it was found that the value of the coefficient of determination shows that the regression model by 60% reflects the direct dependence of the availability of emergency distance education in 30 countries, based on the results of access to personal computers among students and the current cost of education. It has been established that countries such as Denmark, Switzerland, Austria, Norway and Luxembourg have a favorable climate for emergency distance education.

Resumen

El objetivo del estudio es establecer el patrón de desafíos institucionales y nacionales para la formación docente en el contexto de la pandemia de COVID-19, mediante la realización de análisis de regresión e investigación de las regulaciones del mundo, para identificar los desafíos para la formación docente y la capacidad de proporcionar una educación de calidad en el contexto de la educación a distancia. Métodos de investigación: sistematización; análisis comparativo; generalización; análisis de regresión. Resultados. Después de realizar un análisis de regresión, se encontró que el valor del coeficiente de determinación muestra que el modelo de regresión en un 60% refleja la dependencia directa de la disponibilidad de educación a distancia de emergencia en 30 países, con base en los resultados del acceso a computadoras personales entre los estudiantes y el costo actual de la educación. Se ha establecido que países como Dinamarca, Suiza, Austria, Noruega y Luxemburgo tienen un clima favorable para la educación a distancia de emergencia.