

Understanding the foremost challenges in the transition to online teaching and learning during COVID-19 pandemic: A systematic literature review

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Suggested citation: Hamad, W. B. (2022). Understanding the foremost challenges in the transition to online teaching and learning during COVID-19 Pandemic: a systematic literature review. *Journal of Educational Technology & Online Learning*, 5(2), 393-410.

Article Info

Keywords:

Online learning,
Covid-19 Pandemic,
Covid-19 challenges,
Systematic review,
teaching and learning

Review Article

Abstract

The study aims to understand the foremost challenges in the transition to online teaching and learning during the COVID-19 pandemic. The study adopts the PRISMA approach to screening the selection of journal articles and review papers according to the research aims and the inclusion criteria. The journal articles and review papers were extracted and stored in Microsoft Excel and Google Scholar, Academic. Microsoft, Semantic Scholar, Elsevier, and Emerald Insight databases searched relevant documents using formulated keywords. A statistical technique was applied using the M.S. Excel analysis tool (PivotTable and an independent t-Test) to analyze data and determine the differences between teachers and students. The review revealed the evidence that the majority of the studies were primarily focused on the individual developing countries and results from other developing countries were not considered. In addition, the foremost challenges in the transition to online teaching and learning during the covid-19 pandemic were inadequate skills and training, inadequate Internet/Infrastructure, lack of supporting resources and lack of online student engagement and feedback. Finally, the independent t-test reveals there is no statistically significant difference in challenges in the transition to online teaching and learning during the covid-19 pandemic. Both teachers and students encounter similar challenges. The systematic review raised concerns that higher learning needs to effectively implement long term strategies and support teachers and students in getting into online teaching and learning.

1. Introduction

Undeniable, the Corona Virus (COVID-19) pandemic has impacted worldwide. Due to its nature, the COVID-19 has rapidly and abruptly affected many countries across the globe (Cheong et al. 2019; Jacob, Abigeal, and Lydia 2020; Joshi, Vinay, and Bhaskar 2020; Patricia Aguilera-Hermida 2020; Pokhrel and Chhetri 2021). As a result of this impact, human life aspects have changed, and countries from other countries, houses from other houses, and friends from other friends have distanced to avoid the quick spreading of the viruses, which impacts both economically and socially organizational. Every country globally has effectively executed the WHO guidelines on covid-19 and closing their borders (Kagoya 2020).

In several nations, the government had issued a closure of higher education institutions to control the spread of the Corona Virus (Bardesi et al., 2021). Consequently suspending the face-to-face classes (Bardesi et al. 2021; Patricia Aguilera-Hermida 2020) as the traditional methods and activities found are insecure (Tsai et

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al. 2020). This closure has affected many students, families, and teachers (Burgess, Henrik, and April 2020) and twisted unexpected educational experiences (Day et al., 2021). This transition is an entirely new experience for students, educators, and higher education (Mazlan et al. 2021; Patricia Aguilera-Hermida 2020; Pokhrel and Chhetri 2021), notably in higher learning education in developing countries. As a result, in higher education, the students and teachers have been forced to accept and usage of a new approach, the so-called "Education in Emergency" (Cheong et al. 2019; Pokhrel and Chhetri 2021), within short notice and limited preparation time (Tsai et al. 2020). In addition, effectively transition has required Higher education educators to adopt and use online platforms tools (Oyediran et al. 2020) such as Class time, YouTube Ted-Ed, Google Classroom, Google Meet, Blackboard Learn, Zoom, Udemy, G Suite, and many others platforms (Joshi et al. 2020; Mazlan et al. 2021; Mishra, Gupta, and Shree 2020; Pokhrel and Chhetri 2021) in facilitating teaching and learning activities.

A rapid and unexpected transition from traditional face-to-face learning to online learning (Cheong et al. 2019; Sunita 2020) has forced higher learning institutions worldwide to entirely depend on the internet for delivering classes (Ali 2020; Day et al. 2021; Murphy 2020). In the same way, both teachers and students have expressed stress associated with online teaching and learning (Joshi et al. 2020; Mazlan et al. 2021; Patricia Aguilera-Hermida 2020; Tsai et al. 2020). This transition has significant challenges for students and teachers, especially those not experienced with online learning and teaching (Cheong et al., 2019). According to (Mazlan et al. 2021; Tsai et al. 2020), for an effective transition to online teaching and learning, added computer skills, hardware and software support, and a proper internet connection are essential for both students and teachers. Similarly, (Mazlan et al. 2021; Pokhrel and Chhetri 2021) argue that adopting and using appropriate and pertinent pedagogy needs computer knowledge and experience for students and teachers. With this rapid transition, no doubt that students and teachers around the globe have experienced the challenges of the COVID-19 pandemic.

This study, therefore, intends to offer a further comprehensive systematic review of literature on teaching and learning during the covid-19 pandemic and facilitate understanding of the findings on the foremost challenges in the shift to online teaching and learning during the covid-19 pandemic as well as report possible research trends and issues in the field. In this study, the SLR stands for systematic literature review. The study attempts to address the following questions (R.Q.):

Rq1: What is the coverage of studies in county context in prior studies?

Rq2: What are the foremost challenges students and teachers encounter in transitioning to online teaching and learning during the Covid-19 Pandemic?

Rq3: Are there differences in challenges between students and teachers in the transition to online teaching and learning during the Covid-19 Pandemic?

2. Methodology

2.1. Data collection

This systematic literature review (SLR) was collected between May and September 2021. This literature review aimed to understand the foremost challenges in the transition to online teaching and learning during the COVID-19 pandemic. The study adopts the systematic approach since the SLR offers broad article selection methods and a straightforward structure/process for undertaking and writing a literature review (Moher et al. 2009; Pickering and Byrne 2014).

2.2. Search Methods

The search process consists of formulating and selecting *keywords* to search relevant journal articles and review papers (Pickering and Byrne 2014). The established search item 'covid-19 impact' OR 'challenges', followed by several keywords to capture teaching and learning aspects such as 'e-Learning', 'higher learning', 'higher education', 'Distance learning', 'Education', 'Teaching-Learning'. The databases such as Google Scholar, Academic.microsoft, Semantic Scholar, Elsevier, and Emerald Insight were used to acquire relevant journal articles and review papers. In confirming sufficient coverage of literature on this

topic, library expert has consulted in categorising the appropriate search keywords (Pickering and Byrne 2014; Qamar et al. 2021; Turner et al. 2017).

2.3. Quality Evaluation

The Standard Quality Assessment Criteria (SQAC) for Evaluating Primary Research Papers (Kmet, Lee, and Cook 2004) was used to evaluate the quality of the selected publications. The coder (Co-author) read and categorised the chosen papers and rated each for inclusion.

2.4. Search Outcomes

In the paper identification process, two hundred thirty journal articles and review papers were selected from different databases. The search process mainly focused on the challenges encountered by teachers and students in higher education. The PRISMA approach reduces the selection of journal articles and review papers according to the research aims and the inclusion criteria (Moher et al., 2009). By eliminating the duplicated documents not concerned with Higher Education (HE) and not relevant, a total of (n=153, 66%) papers met the criteria. By limiting the papers, the search to the higher education, full-text assessment and eligibility, a total of (n=124, 54%) met the criteria and were found relevant to include in this study. The PRISMA flow chart for search steps is shown in Figure 1.

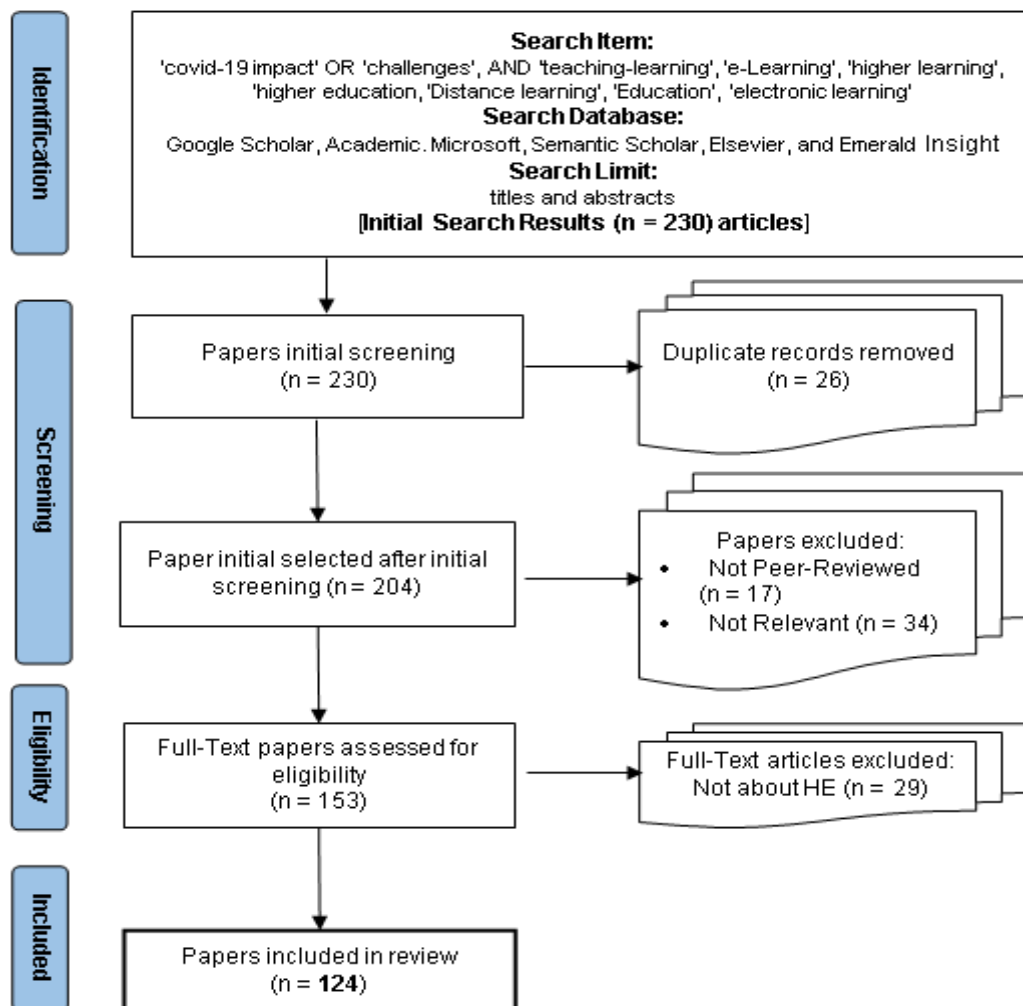


Fig. 1: PRISMA Flow Chart of the Paper Selection Process.

2.5. Coding schemes

For the systematise analysis concerning research questions, the author established a coding scheme to capture the extracted information from each relevant journal article and review paper. In line with the study's primary aim of understanding the foremost challenge in the transition to online teaching and learning

throughout the covid-19 pandemic, the author is interested in identifying the countries examined. The scheme contains the following categories:

Author; Year of Pub; Title; Journal published; Journal Discipline; Countries Examined; Continents; Data collection method (Observation, Surveys, Interviews, Focus groups, Field research, Case studies, Document analysis, Meta-analysis, Census analysis, Modelling). Type of Data (Qualitative, Quantitative, Mixed), Challenges (Teachers and Students perspective).

Furthermore, the author also used the M.S. Excel database created to store extracted information from each article and the Mendeley software to capture the electronic references. The author used a Microsoft Excel database to collect the extracted relevant information from each article concerning the research questions formulated for the study (Qamar et al., 2021).

2.6. Data analysis

As a result of the initial coding and reading process, the relevant journal articles and review papers, the author identified the most challenges in selected journal articles and documents for analysis. The following were the challenges that emerged in the selected relevant journal articles and review papers:

'Lack of suitable pedagogy', 'lack of supporting resources', 'Online Student's Engagement & Feedback', 'Inadequate Internet/Infrastructure', 'Inadequate Skills and Training in Online Teaching', 'Lack of good Strategies in Online Remote', 'Lack of Suitable Online Platform'.

Regarding inter-rater reliability in the coding and identification of the critical terms, the author entered the first ten journal articles and review papers into the database. Finally, import the rest of the journal articles and review papers and M.S. Word and M.S. Excel Analysis Tool (PivotTable and an independent t-test) were used for data manipulation and analysis.

3. Results

Analysis of the coverage of studies and challenges

Rq1: What is the coverage of studies in-country context in prior studies?

Regarding the research question, one aimed to explore the coverage of studies in the county context in prior studies. Fig. 2 shows that a higher number of studies were conducted in India (n=13, 10%), followed by Indonesia (n=11, 9%), the United States (n=8, 6%) with the main focus on developing countries, South Africa and Malaysia (n=5, 4%) each and Nigeria (n=4, 3%). In addition, the review shows that the countries such as the Philippines, Ethiopia, Saudi Arabia, Pakistan, and Australia only (n=3, 2%) each country. Moreover, countries such as Somalia, Russia, Spain, Greece, Bangladesh, Hungary, Ghana, Turkey, Germany, Portugal, Kenya, and Zambia have the studies (n=2, 2%). Besides, the countries such as Lebanon, Tanzania, Slovenia, Libya, United Arab Emirates have (n=1, 1%) each. Furthermore, the reviewed studies show that India, Indonesia, and the United States followed by South Africa, Malaysia, and Nigeria are the countries that examine the challenges encountered by teachers and students in the shift to online teaching and learning during the covid-19 pandemic, and the main focus is in developing nations.

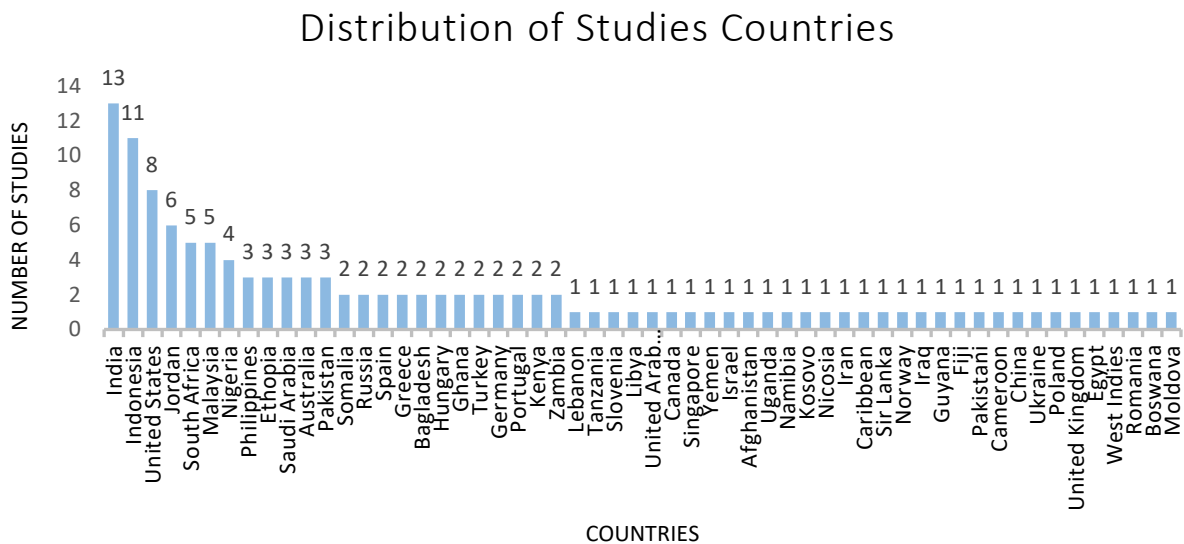


Fig 2: Distribution of Studies by Countries

Rq2: What are the foremost challenges students and teachers encounter in transitioning to online teaching and learning during the Covid-19 Pandemic?

In addressing objective two, aimed to assess the foremost challenges encountered by teachers and students in the shifting to online teaching and learning during the Covid-19 Pandemic. In examining the foremost between these two groups, the study categorised into two parts: the teacher's and students' perspectives.

Teachers' challenges

This SLR examines the teachers' foremost challenges in transitioning to online teaching and learning during the Covid-19 Pandemic. Based on prior studies, seven issues addressed as the foremost challenges encountered by teachers as Skills and Training in Online Teaching, Internet/ Infrastructure, supporting resources, Student Engagement & Feedback, good Strategies in Online Remote, relevant pedagogy, and Suitable Online Platform. The author chose these themes in this study based on the reviewed literature. The fig.3 below shows a detailed description of each theme and its sum score.

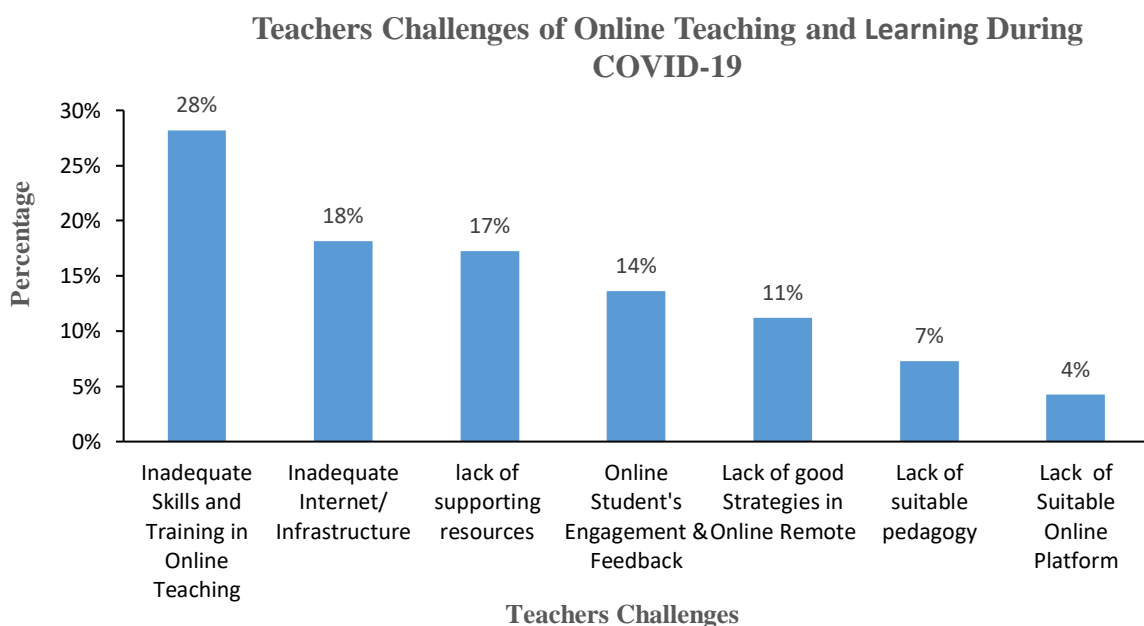


Fig. 3: Teachers' challenges in adopting online teaching and learning

As depicted in Fig. 3, the reviewed studies (n=93, 28%) show inadequate skills and training among teachers in higher education in transition to online teaching and learning. Moreover, inadequate Internet/Infrastructure (n=60, 18%) was challenging teachers in accessing online teaching and learning, followed by a lack of supporting resources (n=57, 17%) and lack of online student engagement and feedback (n=45, 14%). Few reviewed studies have indicated a lack of good strategies (n= 37, 11%) among teachers using online teaching and learning. Furthermore, the lack of appropriate pedagogy in online teaching and learning (n=24, 7%) and the lack of a suitable online platform (n=14, 4%) also challenged teachers to use online teaching and learning during the covid-19 pandemic. The results from the reviewed studies indicate that the foremost challenges encountered by teachers in the transition to online teaching and learning were inadequate skills and training, inadequate Internet/Infrastructure, lack of supporting resources, and lack of online student engagement and feedback.

Students' challenges

From the student's perspective, the SLR examined the student's foremost challenges in the transition to online teaching and learning during the Covid-19 Pandemic. Based on the previous studies, only four dimensions addressed as challenges encountered by students such as Skills and Training in Online Learning, Internet/ Infrastructure, supporting resources, and Engagement & Feedback. The fig. 4 below shows a detailed description of the reviewed studies.

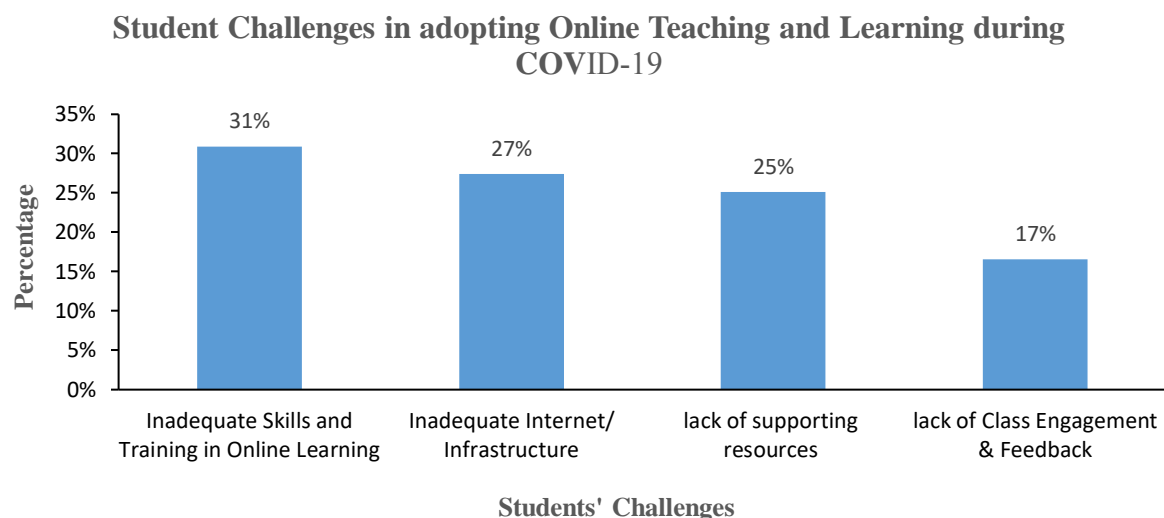


Fig. 4. Student challenges in adopting online teaching and learning

As revealed in fig. 4 above, the result of the reviewed studies shows that inadequate skills and training (n=80, 31%) among students on how to access and use online learning, followed by insufficient access to Internet/Infrastructure (n=71, 27%) hinders them in succeeding online teaching and learning. In addition, the lack of supporting resources (n=65, 25%) has challenged many students in developing nations. Further, few reviewed studies show that the students' lack of class engagement and feedback (n=43, 17%) has risen as a challenge in the transition to online learning during the covid-19 pandemic. Furthermore, the reviewed studies considered all four dimensions confirmed as the student's foremost challenges in the transition to online teaching and learning during the covid-19 pandemic.

Rq3: Are there differences in challenges between students and teachers in the transition to online teaching and learning during the Covid-19 Pandemic?

In this research objective, the SLR intends to evaluate the differences between these two perspectives, i.e., teacher and students' challenges in transitioning to online teaching and learning during the Covid-19 Pandemic. The study carefully chose the primary challenges possessed by both teachers and students and tested them to check for the differences if they occur. Based on the previous illustration, only four correct dimensions were selected and tested to differentiate between teachers' and students' challenges in the

transition to online teaching and learning during the Covid-19 Pandemic. Fig. 5 below illustrates the chosen theme's differences in detail.

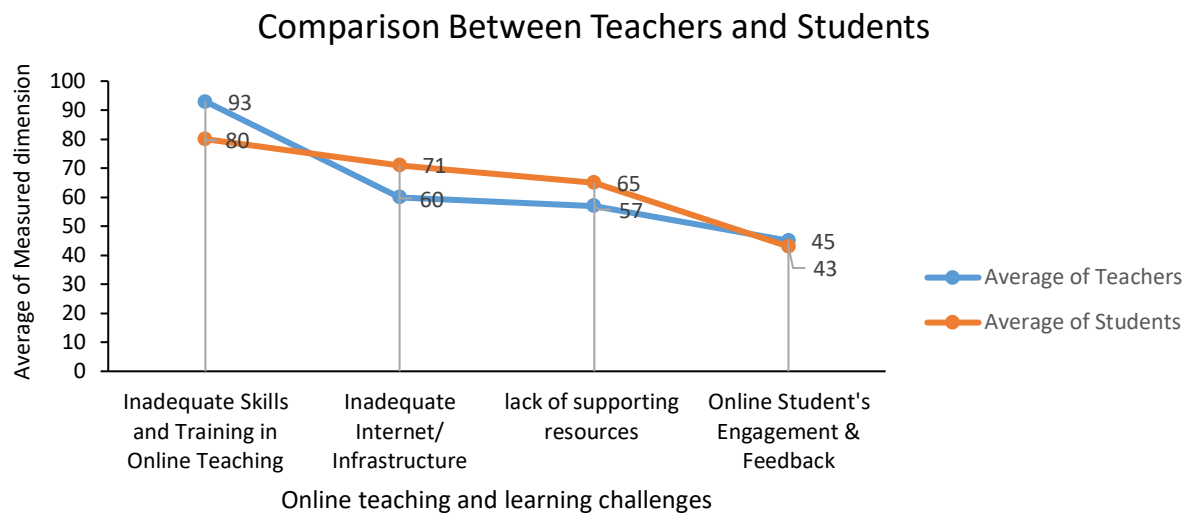


Fig. 5: Teachers and Students Comparison

The results of the reviewed studies indicated that inadequate skills and training on online teaching score 93 for teachers and 80 for students, followed by insufficient Internet/ Infrastructure with an average score of 60 for teachers and 71 for students. In addition, a lack of supporting resources indicated an average score of 57 for teachers and 65 for students. Finally, online students' engagement & feedback indicated an average score of 45 for teachers and 43 for students. Therefore, the SLR studies considered a slight difference revealed in all four dimensions. This result indicates no difference in challenges encountered by teachers and students in the transition to online teaching and learning at the time of the covid-19 pandemic. The result shows that both teachers and students had similar challenges transitioning to online teaching and learning during the covid-19 pandemic.

In confirming the above results, a statistical independent *t*-test method to test whether there is a statistically significant difference between students' and teachers' challenges in the transition to online teaching and learning during the covid-19 pandemic using an analysis tool in Microsoft Excel was applied. Table 1 below shows the result of the *t*-test.

Table 1.

Comparisons between Teachers and Students

	Teachers	Students
Mean	63.75	64.75
Standard Deviation	20.55	15.76
Confidence Level (95.0%)	32.70	25.07
Sig. (2-Tailed)	0.9409	
df	6	
t-Test value	2.446	

An independent sample *t*-test reported that there is no statistically significant difference in challenges encountered by teachers and students, $t(6) = 2.446$, $p = 0.9409$, 95% *C.I.* [32.70] for teachers and [25.07] for students. The students ($M = 64.75$, $SD = 15.76$) was not statistically significantly different as compare to the teachers ($M = 63.75$, $SD = 20.55$).

4. Discussion

With the increasing use of online teaching and learning, many prior studies have addressed the challenges of online teaching and learning in developing nations during the covid-19 pandemic. However, many studies uncovered the foremost challenges in the transition to online teaching and learning during the covid-19 pandemic. This systematic literature review aimed to understand the foremost challenges in the transition to online teaching and learning during the COVID-19 pandemic. The study summarises the foremost challenges encountered by teachers and students and compares these two groups' challenges in the transition to online teaching and learning during the COVID-19 pandemic. In addition, 124 journal articles resulted from a rigorous and systematic search process. Regarding research questions, the study offers insightful outcomes in response to the coverage of studies in county context in prior studies, the foremost challenges encountered by teachers and students in the transition to online teaching-learning during the Covid-19 Pandemic, and compare the challenges between these two groups in the change to online teaching-learning during the COVID-19 pandemic.

The first research question explores the coverage of studies in the county context in prior studies. The review revealed that the countries such as India, Indonesia, and the United States, followed by South Africa, Malaysia, and Nigeria where most countries examine the challenges encountered by teachers and students in the shifting to online teaching and learning during the covid-19 pandemic and the main focus are in developing nations. This result shows that most studies focused mainly on developing countries and other developing countries were not considered. However, some studies examined developed nations, but their focus is on developing nations (see fig. 2). The prior studies show that the developing countries are more vulnerable to the covid-19 pandemic than the developed nation (MUFTAHU 2020; Oyediran et al. 2020) due to several factors, including technological advancement and acceptance. As declared by (Patricia Aguilera-Hermida 2020), more successful transitions to online learning are influenced by the user's intention and the usefulness of the technology. Therefore, failure to address the challenges teachers and students encounter in developing nations will positively affect the choice and perception to adopt and use online teaching and learning during and after the pandemic.

The second research question of this systematic review aimed to explore the foremost challenges encountered by students and teachers in the transition to online teaching and learning during the Covid-19 Pandemic. The study revealed evidence that the foremost challenges in the transition to online teaching and learning were inadequate skills and training, inadequate Internet/Infrastructure, lack of supporting resources, and lack of online student engagement and feedback. Successfully implementing online teaching and learning requires both four issues addressed as a challenge to facilitate the online teaching and learning session and improve the collaboration among teachers and students (see fig. 3 & 4). Moreover, (Patricia Aguilera-Hermida 2020) confirmed that the effectiveness of online teaching and learning depends on the degree of user acceptance and suitable internet connection (Mazlan et al., 2021).

Similarly, in connection to the infrastructure availability and supporting devices such as desktops, laptops, gadgets, software, and hardware support, teachers and students can master sessions and facilitate students' engagement in class during online teaching and learning. In addition, some of the students complained that lack of class engagement and feedback had challenged them; as a result, they feel bored and remain some of their queries unanswered. The engagement and collaboration of an online teaching and learning system mainly depend on the teacher's and student's knowledge and skills, which results from the training on using a specific system. According to (Mazlan et al. 2021), the accomplishment of online teaching and learning depends on the training and skills of the teachers and students. Without the appropriate training and skills will be hard for teachers and students to accomplish the objective of online teaching and learning. In addition, in working in a home scenario, an appropriate setup and adequate resources are essential aspects.

In line with the lack of supporting resources, previous studies show that the availability of sufficient supporting resources will not only enhance teachers' and students' performance and delivery (S Haider and Al-Salman 2020). Nevertheless, it also will facilitate the development of digital content, audio-visual tools for interaction, and content delivery, which then help teachers acquire students' engagement and feedback

to and from students (Cheng & Chau, 2016; Chigeza & Halbert, 2014). On the other side, insufficient access to supporting resources undermines online Learning (Mseleku 2020) by reducing performance and engagement. Other challenges such as lack of good strategies, appropriate pedagogy, and suitable online platform among the teachers have also been complained about as the challenges encountered by teachers in the transition to online teaching and learning during the covid-19 pandemic. However, these issues have become the most challenging and often frustrating aspect resulting from the pandemic in small quantities.

Regarding question three, the review study intended to discover whether there is or no difference in challenges between teachers and students in the transition to online learning during the covid-19 pandemic.

An independent statistical t-test result shows that there are no differences. The review revealed evidence that there is no statistically significant difference in challenges between teachers and students in the shifting to online teaching and learning during the covid-19 pandemic. Both teachers and students encounter similar challenges in transitioning to online teaching and learning (see table 1 and fig. 5). Prior studies (Patricia Aguilera-Hermida 2020) argue that teachers and students have articulated pressure and difficulties about using online teaching and learning, particularly in developing nations.

In the same way, (MUFTAHU 2020) confirms that both teachers and students find the online teaching and learning environment challenging and consequences the tension in acceptance and adoption. Furthermore, (Webb, McQuaid, and Webster 2021) argue that many teachers and students from different countries of the world, particularly developing nations possessed unequal and adequate access to supporting resources, Internet connections, as well as digital skills and training. The systematic review raised concerns that higher learning institutions in developing nations need to effectively implement excellent and longtime strategies in transitions to online teaching and learning and support teachers and students in getting into online teaching and learning.

5. Conclusion and Suggestions

While the covid-19 pandemic remains unbeatable and impacts the world of education, online teaching and learning have become increasingly adopted in many higher learning institutions worldwide. This pandemic has changed traditional (face-to-face) teaching and learning to innovative online teaching and learning. The study summarises the foremost challenges in the transition to online teaching and learning during the covid-19 pandemic and compares the challenges between these two groups. The study highlights the need for higher learning institutions to reduce the tension between teachers and students by engaging in supporting and training programs, improving their infrastructures, and facilitating supporting resources. In addition, as many developing nations experience many challenges, including suitable internet connection, the higher learning institution may choose the appropriate platform that will be effective.

Furthermore, reliable for the low internet connection and appropriate pedagogical strategies for online teaching and learning. The study expresses that many higher learning institutions have left teachers to choose the platform they are interested in and let the students with difficulty follow the classes. In complying with the situation, higher learning institutions in developing nations must consider improving the teaching and learning environment by incorporating new technologies, setups, and digital resources for both teachers and students.

As pandemics continue to remain, at this time, no one knows how long the pandemic will last and what will arise next. The higher learning institutions in developing nations should put adequate technologies and promising strategies in place. Moreover, sound policies will facilitate the adoption of online teaching and learning for the future instead of taking things for granted. According to (Patricia Aguilera-Hermida 2020), an effective online teaching and learning result from careful instructional design and planning. Previous studies show that using online teaching and learning has accomplished higher learning institutions in developed nations where technologies and infrastructure are not problems and leave the developing country struggling with several challenges.

In the same way, (Adarkwah 2021) raised a concern about the teachers and students who work and learn in these developing nations impacted by several challenges in the transition to online teaching and learning. This SLR concludes that there is a need for higher learning institutions in developing countries to come up with long-term and suitable plans and strategies for implementing online teaching and learning for the future for the sustainability of the education system. This study has only focused on a literature review in evaluating the foremost challenges encountered by the teachers and students on the transition to online teaching and learning during the covid-19 pandemic. An in-depth study with a wide range of statistics may also require a future research area.

References

- Abidi, F. A., & Aldhalemi, A. A. (2020). Statistical evaluation of e-learning systems during coronavirus pandemic: A case study. *Advances in Mathematics: Scientific Journal*, 9(12). <https://doi.org/10.37418/amsj.9.12.15>
- Abuhammad, S. (2020). Barriers to distance learning during the COVID-19 outbreak: A qualitative review from parents' perspective. *Heliyon*, 6(11). <https://doi.org/10.1016/j.heliyon.2020.e05482>
- Adanikin, A., Adanikin, A., Adeoye, I. A., Adanikin, A. F., & Adanikin, A. (2020). COVID-19 and E-Learning: Nigeria Tertiary Education System Experience. In *International Journal of Research and Innovation in Applied Science (IJRIAS)* |.
- Adarkwah, M. A. (2021). "I'm not against online teaching, but what about us?": ICT in Ghana post Covid-19. *Education and Information Technologies*, 26(2). <https://doi.org/10.1007/s10639-020-10331-z>
- Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*. <https://doi.org/10.1080/10494820.2020.1813180>
- Alasmari, T. (2021). Learning in the COVID-19 Era: Higher Education Students and Faculty's Experience with Emergency Distance Education. *International Journal of Emerging Technologies in Learning*, 16(9). <https://doi.org/10.3991/ijet.v16i09.20711>
- Al-Baadani, A. A., & Abbas, M. (2020). THE IMPACT OF CORONAVIRUS (COVID19) PANDEMIC ON HIGHER EDUCATION INSTITUTIONS (HEIs) IN YEMEN: CHALLENGES AND RECOMMENDATIONS FOR THE FUTURE. *European Journal of Education Studies*, 7(7). <https://doi.org/10.46827/ejes.v7i7.3152>
- Alchamdani, A., Fatmasari, F., Rahmadani Anugrah, E., Putri Sari, N., Putri, F., & Astina, A. (2020). The Impact of Covid19 Pandemic on Online Learning Process in the College at Southeast Sulawesi. *JURNAL KESEHATAN LINGKUNGAN*, 12(1si). <https://doi.org/10.20473/jkl.v12i1si.2020.129-136>
- Alea, L. A., Fabrea, M. F., Roldan, R. D. A., & Farooqi, A. Z. (2020). Teachers' Covid-19 awareness, distance learning education experiences and perceptions towards institutional readiness and challenges. *International Journal of Learning, Teaching and Educational Research*, Vol. 19. <https://doi.org/10.26803/ijlter.19.6.8>
- Ali, W. (2020). Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 pandemic. *Higher Education Studies*, 10(3). <https://doi.org/10.5539/hes.v10n3p16>
- Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during the COVID-19 pandemic. *Education and Information Technologies*, 25(6). <https://doi.org/10.1007/s10639-020-10219-y>
- Almanar, M. A. (2020). THE SHIFTING OF FACE-TO-FACE LEARNING TO DISTANCE LEARNING DURING THE PANDEMIC COVID-19. *Globish: An English-Indonesian Journal for English, Education, and Culture*, 9(2). <https://doi.org/10.31000/globish.v9i2.2772>

- Almazova, N., Krylova, E., Rubtsova, A., & Odinkaya, M. (2020). Challenges and opportunities for Russian higher education amid covid-19: Teachers' perspective. *Education Sciences*, 10(12). <https://doi.org/10.3390/educsci10120368>
- Al-Okaily, M., Alqudah, H., Matar, A., Lutfi, A., & Taamneh, A. (2020). Dataset on the Acceptance of e-learning System among Universities Students under the COVID-19 Pandemic Conditions. *Data in Brief*, 32. <https://doi.org/10.1016/j.dib.2020.106176>
- Al-Okaily, M., M Alqudah, H., Matar, A., Lutfi, A., & Taamneh, A. (2020). IMPACT OF COVID-19 PANDEMIC ON ACCEPTANCE OF E-LEARNING SYSTEM IN JORDAN: A CASE OF TRANSFORMING THE TRADITIONAL EDUCATION SYSTEMS. *Humanities & Social Sciences Reviews*, 8(4). <https://doi.org/10.18510/hssr.2020.8483>
- Alsoud, A. R., & Harasis, A. A. (2021). The impact of the covid-19 pandemic on students' e-learning experience in Jordan. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(5). <https://doi.org/10.3390/jtaer16050079>
- Anwar, M., Khan, A., & Sultan, K. (2020). The Barriers and Challenges Faced by Students in Online Education during Covid-19 Pandemic in Pakistan. *Gomal University Journal of Research*, 36(1).
- Areba, G. N. (2020). COVID-19 Pandemic Impact on Kenyan Education Sector: Learner Challenges and Mitigations. *Journal of Research Innovation and Implications in Education*, 4(2).
- Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 Pandemic on the life of higher education students: A global perspective. *Sustainability (Switzerland)*, 12(20). <https://doi.org/10.3390/su12208438>
- Assunção Flores, M., & Gago, M. (2020). Teacher education in times of COVID-19 Pandemic in Portugal: national, institutional and pedagogical responses. *Journal of Education for Teaching*, 46(4). <https://doi.org/10.1080/02607476.2020.1799709>
- Azhari, B., & Fajri, I. (2021). Distance learning during the COVID-19 Pandemic: School closure in Indonesia. *International Journal of Mathematical Education in Science and Technology*. <https://doi.org/10.1080/0020739X.2021.1875072>
- Baloran, E. T. (2020). Knowledge, Attitudes, Anxiety, and Coping Strategies of Students during COVID-19 Pandemic. *Journal of Loss and Trauma*, 25(8). <https://doi.org/10.1080/15325024.2020.1769300>
- Bani Ahmad Bani, F. A. R. O. (2021). Evaluation of the Use of Distance Learning in Jordanian Universities during the COVID19 Pandemic. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(6). <https://doi.org/10.17762/turcomat.v12i6.4837>
- Bardesi, H., Al-Mashaikhi, A., Basahel, A., & Yamin, M. (2021). COVID-19 compliant and cost-effective teaching model for King Abdulaziz University. *International Journal of Information Technology (Singapore)*, 13(4). <https://doi.org/10.1007/s41870-021-00684-0>
- Batubara, B. M. (2021). The Problems of the World of Education in the Middle of the Covid-19 Pandemic. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(1). <https://doi.org/10.33258/birci.v4i1.1626>
- Béché, E. (2020). Cameroonian responses to COVID-19 in the education sector: Exposing an inadequate education system. *International Review of Education*, 66(5–6). <https://doi.org/10.1007/s11159-020-09870-x>
- Belay, D. G. (2020). COVID-19, Distance Learning and Educational Inequality in Rural Ethiopia. *Pedagogical Research*, 5(4). <https://doi.org/10.29333/pr/9133>
- Burgess, S., Henrik, H., & April, S. (2020). Schools, skills, and Learning: The impact of COVID-. *VOX, CEPR Policy Portal*, (September).

- Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: a literature review of online teaching and learning practices. *European Journal of Teacher Education*, 43(4). <https://doi.org/10.1080/02619768.2020.1821184>
- Chakraborty, P., Mittal, P., Gupta, M. S., Yadav, S., & Arora, A. (2021). Opinion of students on online education during the COVID-19 pandemic. *Human Behavior and Emerging Technologies*, 3(3). <https://doi.org/10.1002/hbe2.240>
- Chaturvedi, K., Vishwakarma, D. K., & Singh, N. (2021). COVID-19 and its impact on education, social life and mental health of students: A survey. *Children and Youth Services Review*, 121. <https://doi.org/10.1016/j.chilyouth.2020.105866>
- Cheong, C., Coldwell Neilson, J., Luo, T., & MacCallum, K. (2019). Covid-19 And It Education: Introduction To The Special Series. *Journal of Information Technology Education: Research*, 19. <https://doi.org/10.28945/4654>
- Choi, B. Y., Song, S., & Zaman, R. (2020). Smart Education: Opportunities and Challenges Induced by COVID-19 pandemic: d Study]. *2020 IEEE International Smart Cities Conference, ISC2 2020*. <https://doi.org/10.1109/ISC251055.2020.9239063>
- Crawford, J., Henderson, K. B., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., ... Lam, S. (2020). Journal of Applied Learning & Teaching COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, 3(1).
- Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education*, 43(4). <https://doi.org/10.1080/02619768.2020.1815702>
- Day, T., Chang, I. C. C., Chung, C. K. L., Doolittle, W. E., Housel, J., & McDaniel, P. N. (2021). The Immediate Impact of COVID-19 on Postsecondary Teaching and Learning. *Professional Geographer*, 73(1). <https://doi.org/10.1080/00330124.2020.1823864>
- Diana, N., Suhendra, S., & Yohannes, Y. (2020). Teachers' difficulties in implementing distance learning during the Covid-19 Pandemic. *ACM International Conference Proceeding Series*. <https://doi.org/10.1145/3436756.3437029>
- Dick, G., Akbulut, A. Y., & Matta, V. (2020). Teaching and learning transformation in the time of the Coronavirus crisis. *Journal of Information Technology Case and Application Research*, 22(4). <https://doi.org/10.1080/15228053.2020.1861420>
- Dube, B. (2020). Rural online learning in the context of COVID 19 in South Africa: Evoking an inclusive education approach. *Multidisciplinary Journal of Educational Research*, 10(2). <https://doi.org/10.17583/remie.2020.5607>
- Dutta, S., & Smita, M. K. (2020). The Impact of COVID-19 Pandemic on Tertiary Education in Bangladesh: Students' Perspectives. *Open Journal of Social Sciences*, 08(09). <https://doi.org/10.4236/jss.2020.89004>
- El Firdoussi, S., Lachgar, M., Kabaili, H., Rochdi, A., Goujdami, D., & El Firdoussi, L. (2020). Assessing Distance Learning in Higher Education during the COVID-19 Pandemic. *Education Research International*, 2020. <https://doi.org/10.1155/2020/8890633>
- El Refae, G. A., Kaba, A., & Eletter, S. (2021). Distance learning during COVID-19 pandemic: satisfaction, opportunities and challenges as perceived by faculty members and students. *Interactive Technology and Smart Education*. <https://doi.org/10.1108/ITSE-08-2020-0128>
- El Said, G. R. (2021). How Did the COVID-19 Pandemic Affect Higher Education Learning Experience? An Empirical Investigation of Learners' Academic Performance at a University in a Developing Country. *Advances in Human-Computer Interaction*, 2021. <https://doi.org/10.1155/2021/6649524>

- ELVÍS MBIYDZENYUY, N. (2020). Teaching and learning in resource-limited settings in the face of the COVID-19 pandemic. *Journal of Educational Technology and Online Learning*. <https://doi.org/10.31681/jetol.732077>
- Feruzi, S. M., & Li, Y. (2020). Application of EdTech in Tanzania: Effectiveness of Radio and Television in Teaching and Learning amid COVID-19 Pandemic. *International Journal of Advanced Engineering Research and Science*, 7(8). <https://doi.org/10.22161/ijaers.78.35>
- Gamede, B. T., Ajani, O. A., & Afolabi, O. S. (2021). Exploring the Adoption and Usage of Learning Management System as Alternative for Curriculum Delivery in South African Higher Education Institutions during Covid-19 Lockdown. *International Journal of Higher Education*, 11(1). <https://doi.org/10.5430/ijhe.v11n1p71>
- García-Morales, V. J., Garrido-Moreno, A., & Martín-Rojas, R. (2021). The Transformation of Higher Education After the COVID Disruption: Emerging Challenges in an Online Learning Scenario. *Frontiers in Psychology*, Vol. 12. <https://doi.org/10.3389/fpsyg.2021.616059>
- Hadar, L. L., Ergas, O., Alpert, B., & Ariav, T. (2020). Rethinking teacher education in a VUCA world: student teachers' social-emotional competencies during the Covid-19 crisis. *European Journal of Teacher Education*, 43(4). <https://doi.org/10.1080/02619768.2020.1807513>
- Harsha R, D. T. B. (2020). Covid -19 Lockdown-Challenges to Higher Education. *An International Multidisciplinary Double-Blind Peer-Reviewed Research Journal*, 2(4).
- Hashemi, A. (2021). Online teaching experiences in higher education institutions of Afghanistan during the COVID-19 outbreak: Challenges and opportunities. *Cogent Arts and Humanities*, 8(1). <https://doi.org/10.1080/23311983.2021.1947008>
- Henaku, E. A. (2020). Covid-19: Online learning experience college students: The case of Ghana. *International Journal of Multidisciplinary Sciences and Advanced Technology*, 1(2).
- Herring, E., Campbell, P., Elmi, M., Ismail, L., McNeill, S., Rubac, A., ... Shidane, M. (2020). COVID-19 Responses and Education in Somalia/Somaliland. *Sociology Mind*, 10(04). <https://doi.org/10.4236/sm.2020.104013>
- Ismaili, Y. (2020). Evaluation of students' attitude toward distance learning during the Pandemic (Covid-19): a case study of ELTE University. *On the Horizon*, 29(1). <https://doi.org/10.1108/OTH-09-2020-0032>
- Jacob, O. N., Abigeal, I., & Lydia, A. E. (2020). Impact of COVID-19 on the Higher Institutions Development in Nigeria. *Electronic Research Journal of Social Sciences and Humanities*, 2(I).
- Jan, A., Sultana, I., & Adnan, M. (2020). Digital Media and Smart Education in Pakistan: Challenges and Prospects for the Teachers in the Age of E-Learning. *Global Educational Studies Review*, V(IV). [https://doi.org/10.31703/gesr.2020\(v-iv\).06](https://doi.org/10.31703/gesr.2020(v-iv).06)
- Jena, P. K. (2020). Impact of Covid-19 on higher education in India. *International Journal of Advanced Education and Research*, 5(3).
- JENA, P. K. (2020). Challenges and Opportunities created by Covid-19 for ODL: A case study of IGNOU. *International Journal for Innovative Research in Multidisciplinary Field (IJIRMF)*. <https://doi.org/10.31235/osf.io/jy2td>
- Jili, N. N., Ede, C. I., & Masuku, M. M. (2021). Emergency Remote Teaching in Higher Education During Covid-19: Challenges and Opportunities. *International Journal of Higher Education*, 10(5). <https://doi.org/10.5430/ijhe.v10n5p1>
- Joshi, A., Vinay, M., & Bhaskar, P. (2020). Impact of coronavirus pandemic on the Indian education sector: perspectives of teachers on online teaching and assessments. *Interactive Technology and Smart Education*. <https://doi.org/10.1108/ITSE-06-2020-0087>

- Kagoya, S. (2020). The Use of Digital Transformation to Address Education Challenges Caused by COVID-19 in Developing Countries. *Social Sciences*, Vol. 9.
- Kaisara, G., & Bwalya, K. J. (2020). Investigating the E-Learning Challenges Faced by Students during Covid-19 in Namibia. *International Journal of Higher Education*, 10(1). <https://doi.org/10.5430/ijhe.v10n1p308>
- Karalis, T., & Raikou, N. (2020). Teaching at the Times of COVID-19: Inferences and Implications for Higher Education Pedagogy. *International Journal of Academic Research in Business and Social Sciences*, 10(5). <https://doi.org/10.6007/ijarbss/v10-i5/7219>
- Karsenti, T., Poellhuber, B., Roy, N., & Parent, S. (2020). The Impact of COVID-19 on Higher Education and Educational Technology – Part 1. *Revue Internationale Des Technologies En Pédagogie Universitaire*, 17(2). <https://doi.org/10.18162/ritpu-2020-v17n2-02>
- Kathula, D. N. (2020). Effect of Covid-19 Pandemic on the Education System in Kenya. *Journal of Education*.
- Kayombo, K. M., & Mwiinga, B. (2021). Acceptability and challenges of online higher education in the covid-19 era in Zambia. *ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL*, 11(2). <https://doi.org/10.5958/2249-7137.2021.00568.1>
- Kedra, K., & Kaltsidis, C. (2020). EFFECTS OF THE COVID-19 PANDEMIC ON UNIVERSITY PEDAGOGY: STUDENTS' EXPERIENCES AND CONSIDERATIONS. *European Journal of Education Studies*, 7(8). <https://doi.org/10.46827/ejes.v7i8.3176>
- Khadija Alhumaid, S. (2020). COVID-19 & Elearning: Perceptions & Attitudes of Teachers Towards E-Learning Acceptance in the Developing Countries. *Multicultural Education*, 6. <https://doi.org/10.5281/zenodo.4060121>
- Khan, M. M., Rahman, S. M. T., & Islam, S. T. A. (2021). Online Education System in Bangladesh during COVID-19 Pandemic. *Creative Education*, 12(02). <https://doi.org/10.4236/ce.2021.122031>
- Kmet, L. M., Lee, R. C., & Cook, L. S. (2004). HTA Initiative # 13. Standard quality assessment criteria for evaluating primary research papers from a variety of fields. In *Methodology Papers*.
- Kummitha, H. R., Kolloju, N., Chittoor, P., & Madepalli, V. (2021). Coronavirus Disease 2019 and Its Effect on Teaching and Learning Process in the Higher Educational Institutions. *Higher Education for the Future*, 8(1). <https://doi.org/10.1177/2347631120983650>
- Kundu, A., & Bej, T. (2021). COVID-19 response: students' readiness for shifting classes online. *Corporate Governance (Bingley)*. <https://doi.org/10.1108/CG-09-2020-0377>
- L.M., M., R., B., & Aithal, P. S. (2020). Impact of COVID-19 on Redefining the Services of Educational Institutions using Ubiquitous Technology. *International Journal of Management, Technology, and Social Sciences*. <https://doi.org/10.47992/ijmts.2581.6012.0118>
- Leal Filho, W., Price, E., Wall, T., Shiel, C., Azeiteiro, U. M., Mifsud, M., ... LeVasseur, T. J. (2021). COVID-19: the impact of a global crisis on sustainable development teaching. *Environment, Development and Sustainability*, 23(8). <https://doi.org/10.1007/s10668-020-01107-z>
- Maatuk, A. M., Elberkawi, E. K., Aljawarneh, S., Rashaideh, H., & Alharbi, H. (2021). The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. *Journal of Computing in Higher Education*. <https://doi.org/10.1007/s12528-021-09274-2>
- Mazlan, A. F., Mohamad, M., Reesha, A., Kassim, R., Othman, Z., & Kummin, S. (2021). Challenges and Strategies to Enhance Online Remote Teaching and Learning by Tertiary Institution Educators: A Literature Review. *Creative Education*, 12(04). <https://doi.org/10.4236/ce.2021.124050>

- Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International Journal of Educational Research Open*, 1. <https://doi.org/10.1016/j.ijedro.2020.100012>
- Mohamad Nasri, N., Husnin, H., Mahmud, S. N. D., & Halim, L. (2020). Mitigating the COVID-19 pandemic: a snapshot from Malaysia into the coping strategies for pre-service teachers' education. *Journal of Education for Teaching*, 46(4). <https://doi.org/10.1080/02607476.2020.1802582>
- Mohamed, M. H., Ahmed, S. A., Hussein, A. M., Ahmed, A. S. A., Mohamed, I. I., & Sheikh, A. M. (2020). The Impact of Coronavirus (COVID-19) on Higher Education Case Study Private Universities in Mogadishu, Somalia. *Creative Education*, 11(11). <https://doi.org/10.4236/ce.2020.1111165>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement Flow diagram. *PLoS Medicine*, 6.
- Moorhouse, B. L. (2020). Adaptations to a face-to-face initial teacher education course 'forced' online due to the COVID-19 pandemic. *Journal of Education for Teaching*. <https://doi.org/10.1080/02607476.2020.1755205>
- Moralista, R. B., & Oducado, R. M. F. (2020). Faculty perception toward online education in a state college in the Philippines during the coronavirus disease 19 (COVID-19) pandemic. *Universal Journal of Educational Research*, 8(10). <https://doi.org/10.13189/ujer.2020.081044>
- Mouchantaf, M. (2020). The covid-19 Pandemic: Challenges faced and lessons learned regarding distance learning in Lebanese higher education institutions. *Theory and Practice in Language Studies*, 10(10). <https://doi.org/10.17507/tpls.1010.11>
- Mseleku, Z. (2020). A Literature Review of E-Learning and E-Teaching in the Era of Covid-19 Pandemic. *International Journal of Innovative Science and Research Technology*, 5(10).
- MUFTAHU, M. (2020). Higher Education and Covid-19 Pandemic: Matters Arising and the Challenges of Sustaining Academic Programs in Developing African Universities. *International Journal of Educational Research Review*. <https://doi.org/10.24331/ijere.776470>
- Müller, A. M., Goh, C., Lim, L. Z., & Gao, X. (2021). Covid-19 emergency elearning and beyond: Experiences and perspectives of university educators. *Education Sciences*, 11(1). <https://doi.org/10.3390/educsci11010019>
- Murphy, M. P. A. (2020). COVID-19 and emergency eLearning: Consequences of the securitisation of higher education for post-pandemic pedagogy. *Contemporary Security Policy*, 41(3). <https://doi.org/10.1080/13523260.2020.1761749>
- Naidoo, P., & Cartwright, D. (2020). Where to from Here? Contemplating the Impact of COVID-19 on South African Students and Student Counseling Services in Higher Education. *Journal of College Student Psychotherapy*. <https://doi.org/10.1080/87568225.2020.1842279>
- Nambiar, D. (2020). The impact of online Learning during COVID-19: students' and teachers' perspectives. *The International Journal of Indian Psychology*, 8(2).
- Noor, S., Isa, F. M., & Mazhar, F. F. (2020). Online Teaching Practices During the COVID-19 Pandemic. *Educational Process: International Journal*, 9(3). <https://doi.org/10.22521/edupij.2020.93.4>
- Ntshwarang, P. N., Malinga, T., & Losike-Sedimo, N. (2021). eLearning Tools at the University of Botswana: Relevance and Use Under COVID-19 Crisis. *Higher Education for the Future*, 8(1). <https://doi.org/10.1177/2347631120986281>
- Nuere, S., & de Miguel, L. (2020). The Digital/Technological Connection with COVID-19: An Unprecedented Challenge in University Teaching. *Technology, Knowledge and Learning*. <https://doi.org/10.1007/s10758-020-09454-6>

- Organisation., W. H., & WHO. (2020). Pneumonia of unknown cause – China. *Disease Outbreak News*.
- Oyediran, W. O., Omoare, A. M., Owoyemi, M. A., Adejobi, A. O., & Fasasi, R. B. (2020). Prospects and limitations of e-learning application in private tertiary institutions amidst COVID-19 lockdown in Nigeria. *Heliyon*, 6(11). <https://doi.org/10.1016/j.heliyon.2020.e05457>
- Oyedotun, T. D. (2020). A sudden change of pedagogy in education driven by COVID-19: Perspectives and evaluation from a developing country. *Research in Globalization*, 2. <https://doi.org/10.1016/j.resglo.2020.100029>
- Ozili, P. (2020). COVID-19 in Africa: socio-economic impact, policy response and opportunities. *International Journal of Sociology and Social Policy*. <https://doi.org/10.1108/IJSSP-05-2020-0171>
- Paliwal, M., & Singh, A. (2021). Teacher readiness for online teaching-learning during COVID –19 outbreak: a study of Indian institutions of higher education. *Interactive Technology and Smart Education, ahead-of-p*(ahead-of-print). <https://doi.org/10.1108/itse-07-2020-0118>
- Patricia Aguilera-Hermida, A. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*, 1. <https://doi.org/10.1016/j.ijedro.2020.100011>
- Pesha, A. V., & Kamarova, T. A. (2020). *Online Education: Challenges and Opportunities for Developing Key Competencies of the 21st Century During the COVID-19 Pandemic*. <https://doi.org/10.2991/assehr.k.201105.029>
- Pickering, C., & Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early-career researchers. *Higher Education Research and Development*, 33(3). <https://doi.org/10.1080/07294360.2013.841651>
- Piotrowski, C., & King, C. (2020). COVID-19 Pandemic: Challenges and Implications for Higher Education. *The University of West Florida*, 141(2).
- Pokhrel, S., & Chhetri, R. (2021). A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. *Higher Education for the Future*, 8(1). <https://doi.org/10.1177/2347631120983481>
- Putri, R. S., Purwanto, A., Pramono, R., Asbari, M., Wijayanti, L. M., & Hyun, C. C. (2020). Impact of the COVID-19 Pandemic on online home learning: An explorative study of primary schools in Indonesia. *International Journal of Advanced Science and Technology*, 29(5).
- Qamar, Y., Agrawal, R. K., Samad, T. A., & Chiappetta Jabbour, C. J. (2021). When technology meets people: the interplay of artificial intelligence and human resource management. *Journal of Enterprise Information Management, ahead-of-p*(ahead-of-print). <https://doi.org/10.1108/jeim-11-2020-0436>
- Qekaj-Thaqi, A., & Thaqi, L. (2021). The Importance of Information and Communication Technologies (ICT) during the COVID-19—Pandemic in Case of Kosovo (Analytical Approach of Students Perspective). *OALib*, 08(07). <https://doi.org/10.4236/oalib.1106996>
- Rameez, A., Fowsar, M. A. M., & Lumna, N. (2020). Impact of Covid-19 on Higher Education Sectors in Sri Lanka: A Study based on the South Eastern University of Sri Lanka. *Journal of Educational and Social Research*, 10(6). <https://doi.org/10.36941/jesr-2020-0132>
- Rashid, S., & Yadav, S. S. (2020). Impact of Covid-19 Pandemic on Higher Education and Research. *Indian Journal of Human Development*, Vol. 14. <https://doi.org/10.1177/0973703020946700>
- Rizun, M., & Strzelecki, A. (2020). Students' acceptance of the covid-19 impacts on shifting higher education to distance learning in Poland. *International Journal of Environmental Research and Public Health*, 17(18). <https://doi.org/10.3390/ijerph17186468>

- Roman, M., & Plopeanu, A. P. (2021). The effectiveness of the emergency eLearning during the COVID-19 pandemic. The case of higher education in economics in Romania. *International Review of Economics Education*, 37. <https://doi.org/10.1016/j.iree.2021.100218>
- Rulandari, N. (2020). The Impact of the Covid-19 Pandemic on the World of Education in Indonesia. *Ilomata International Journal of Social Science*, 1(4). <https://doi.org/10.52728/ijss.v1i4.174>
- S Haider, A., & Al-Salman, S. (2020). COVID-19'S IMPACT ON THE HIGHER EDUCATION SYSTEM IN JORDAN: ADVANTAGES, CHALLENGES, AND SUGGESTIONS. *Humanities & Social Sciences Reviews*, 8(4). <https://doi.org/10.18510/hssr.2020.84131>
- Sahu, P. (2020). Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. *Cureus*. <https://doi.org/10.7759/cureus.7541>
- Sari, T., & Nayır, F. (2020). Challenges in distance education during the (Covid-19) pandemic period. *Qualitative Research in Education*, 9(3). <https://doi.org/10.17583/qre.2020.5872>
- Scherer, R., Howard, S. K., Tondeur, J., & Siddiq, F. (2021). Profiling teachers' readiness for online teaching and learning in higher education: Who's ready? *Computers in Human Behavior*, 118. <https://doi.org/10.1016/j.chb.2020.106675>
- Scull, J., Phillips, M., Sharma, U., & Garnier, K. (2020). Innovations in teacher education at the time of COVID19: an Australian perspective. *Journal of Education for Teaching*, 46(4). <https://doi.org/10.1080/02607476.2020.1802701>
- Seladorai, D., & Mohamed, M. (2021). Digital Learning among Postgraduate Students in the Times of COVID-19: A Literature Review. *Creative Education*, 12(07). <https://doi.org/10.4236/ce.2021.127114>
- Shin, M., & Hickey, K. (2021). Needs a little TLC: examining college students' emergency remote teaching and learning experiences during COVID-19. *Journal of Further and Higher Education*, 45(7). <https://doi.org/10.1080/0309877X.2020.1847261>
- Simamora, R. M. (2020). The Challenges of Online Learning during the COVID-19 Pandemic: An Essay Analysis of Performing Arts Education Students. *Studies in Learning and Teaching*, 1(2). <https://doi.org/10.46627/silet.v1i2.38>
- Stukalo, N., & Simakhova, A. (2020). COVID-19 Impact on Ukrainian Higher Education. *Universal Journal of Educational Research*, 8(8). <https://doi.org/10.13189/ujer.2020.080846>
- Sunita, M.-L. (2020). Education in the Era of COVID-19: Innovative Solutions to Real Challenges. *The Educational Review, USA*, 4(11). <https://doi.org/10.26855/er.2020.11.002>
- Sutiah, S., Slamet, S., Shafqat, A., & Supriyono, S. (2020). Implementation of distance learning during the covid-19 pandemic in faculty of education and teacher training. *Cypriot Journal of Educational Sciences*, 15(5). <https://doi.org/10.18844/CJES.V15I5.5151>
- Syauqi, K., Munadi, S., & Triyono, M. B. (2020). Students' perceptions toward vocational education on online learning during the COVID-19 pandemic. *International Journal of Evaluation and Research in Education*, 9(4). <https://doi.org/10.11591/ijere.v9i4.20766>
- Tadesse, S., & Muluye, W. (2020). The Impact of COVID-19 Pandemic on Education System in Developing Countries: A Review. *Open Journal of Social Sciences*, 08(10). <https://doi.org/10.4236/jss.2020.810011>
- Tamrat, W. (2020). Enduring the impacts of COVID-19: experiences of the private higher education sector in Ethiopia. *Studies in Higher Education*. <https://doi.org/10.1080/03075079.2020.1859690>

- Tsai, C. H., Rodriguez, G. R., Li, N., Robert, J., Serpi, A., & Carroll, J. M. (2020). Experiencing the Transition to Remote Teaching and Learning during the COVID-19 Pandemic. *Interaction Design and Architecture(S)*, (46).
- Țurcanu, D., Siminiuc, R., & Bostan, V. (2020). The Impact of the COVID-19 Pandemic on the Use of Digital Technologies in Ensuring the Efficient e-Learning Process at the Technical University of Moldova. *Creative Education*, 11(10). <https://doi.org/10.4236/ce.2020.1110154>
- Turner, J. A., Babcock, R. C., Hovey, R., & Kendrick, G. A. (2017). Deep thinking: A systematic review of mesophotic coral ecosystems. *ICES Journal of Marine Science*, Vol. 74. <https://doi.org/10.1093/icesjms/fsx085>
- Ubaedillah, U., & Pratiwi, D. I. (2021). Utilisation of Information Technology during the Covid-19 Pandemic: Student's Perception of Online Lectures. *EDUKATIF: JURNAL ILMU PENDIDIKAN*, 3(2). <https://doi.org/10.31004/edukatif.v3i2.320>
- Webb, A., McQuaid, R. W., & Webster, C. W. R. (2021). Moving learning online and the COVID-19 pandemic: a university response. *World Journal of Science, Technology and Sustainable Development*, 18(1). <https://doi.org/10.1108/wjstsd-11-2020-0090>
- Yaman, F., Saatçioğlu, Ö., & Karademir, A. (2020). Challenges of higher education institutions against COVID-19: The case of Turkey. *Journal of Pedagogical Research*, 4(4). <https://doi.org/10.33902/jpr.2020063574>
- Yuan, L. M. (2021). Student's Attitude and Satisfaction towards Transformative Learning: A Research Study on Emergency Remote Learning in Tertiary Education. *Creative Education*, 12(03). <https://doi.org/10.4236/ce.2021.123035>
- Zarei, S., & Mohammadi, S. (2021). Challenges of higher education related to e-learning in developing countries during COVID-19 spread: a review of the perspectives of students, instructors, policymakers, and ICT experts. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-021-14647-2>
- Zawacki-Richter, O. (2021). The current state and impact of Covid-19 on digital higher education in Germany. *Human Behavior and Emerging Technologies*, 3(1). <https://doi.org/10.1002/hbe2.238>