

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

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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.

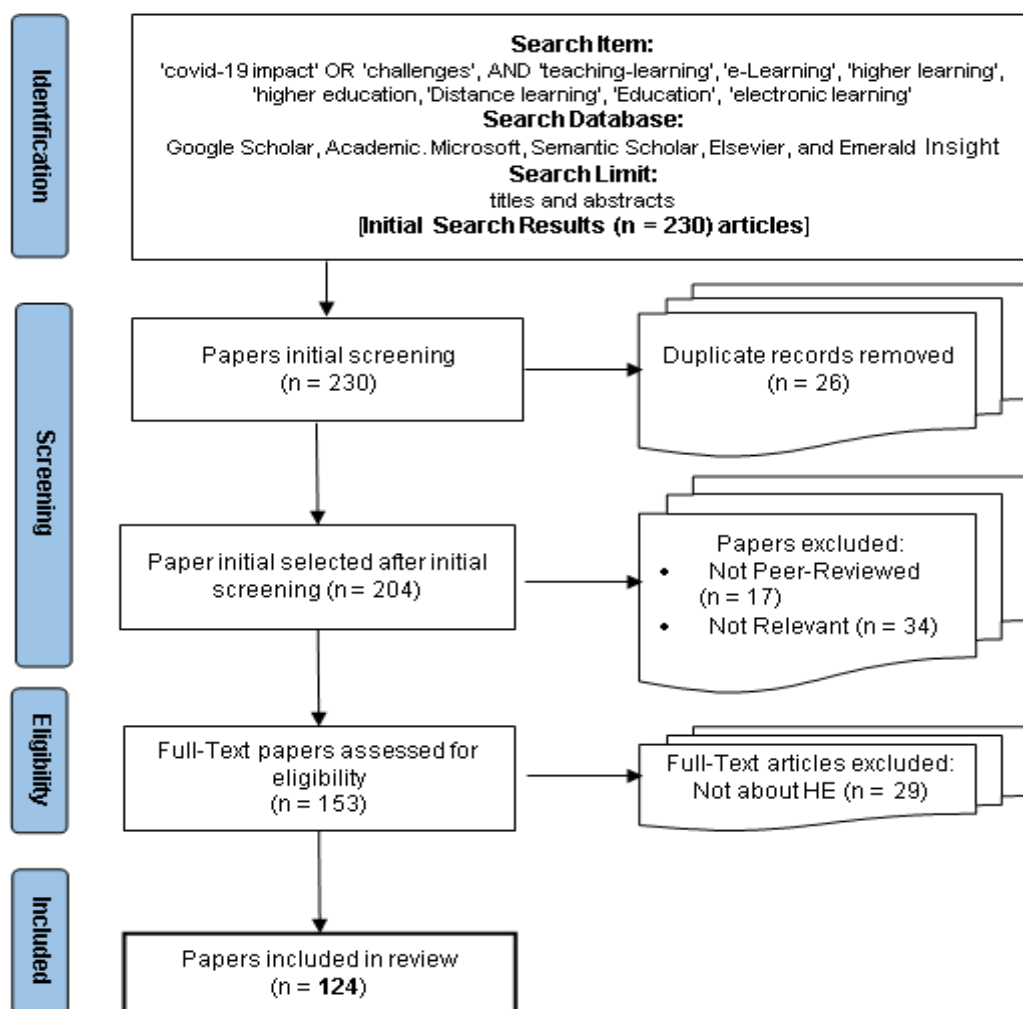


Fig. 1: PRISMA Flow Chart of the Paper Selection Process.

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.

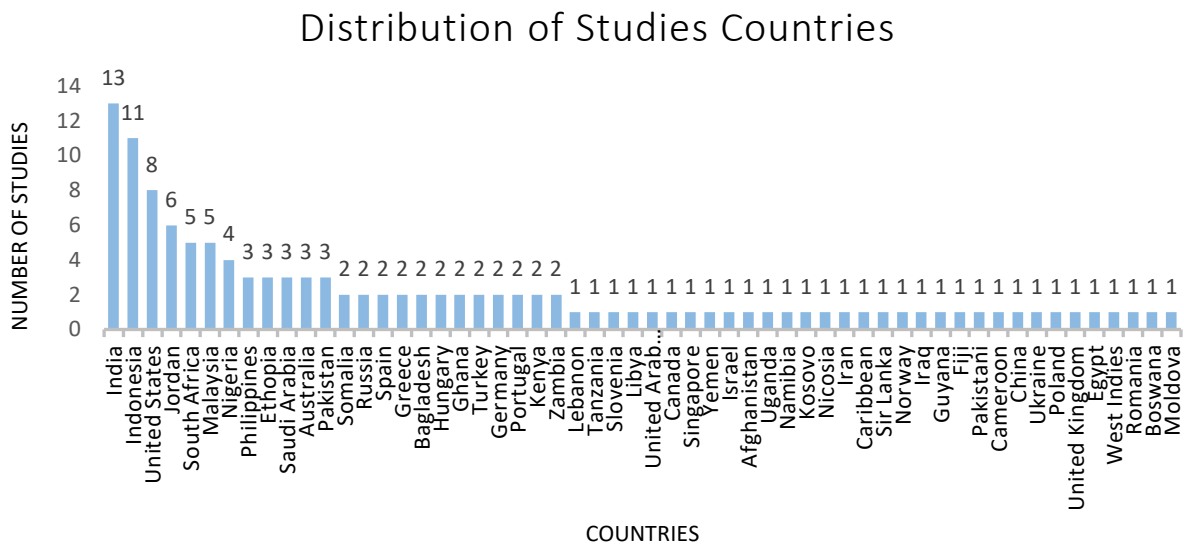


Fig 2: Distribution of Studies by Countries

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.

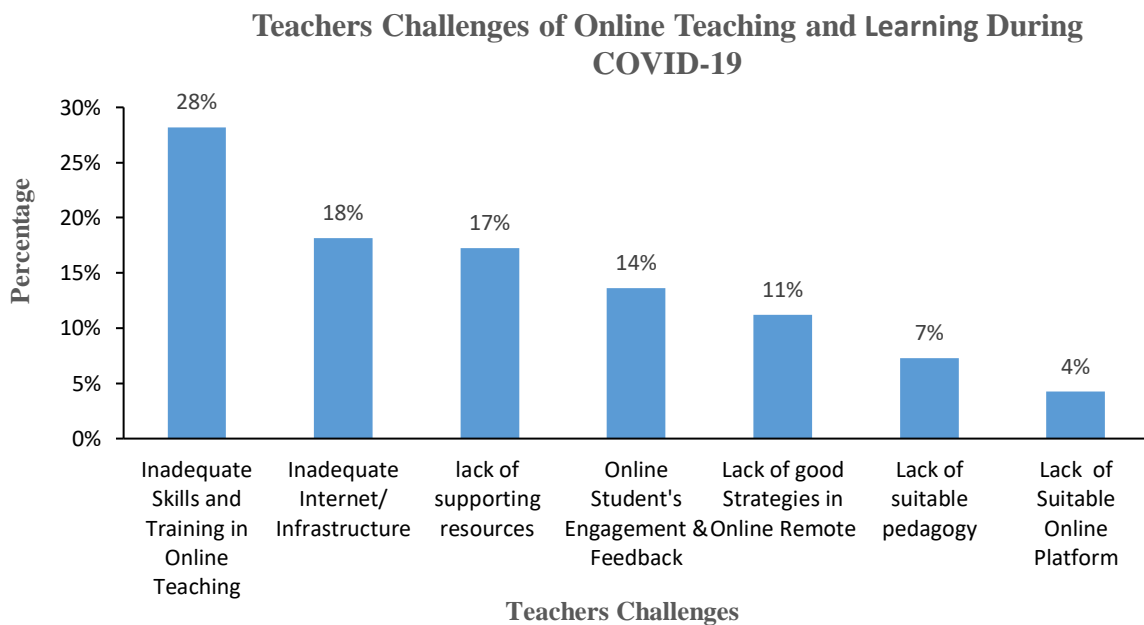


Fig. 3: Teachers' challenges in adopting online teaching and learning

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.

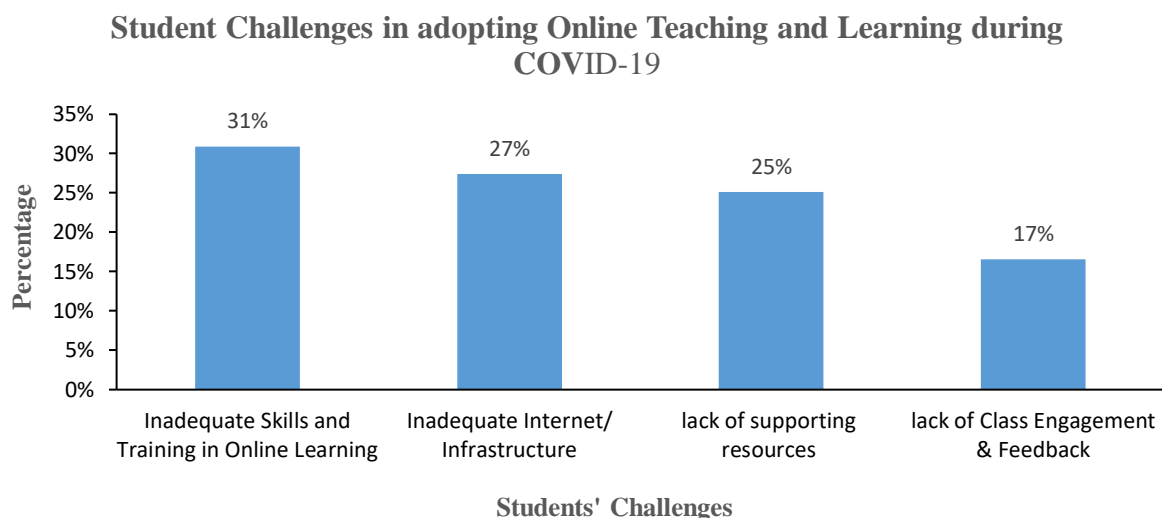


Fig. 4. Student challenges in adopting online teaching and learning

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.

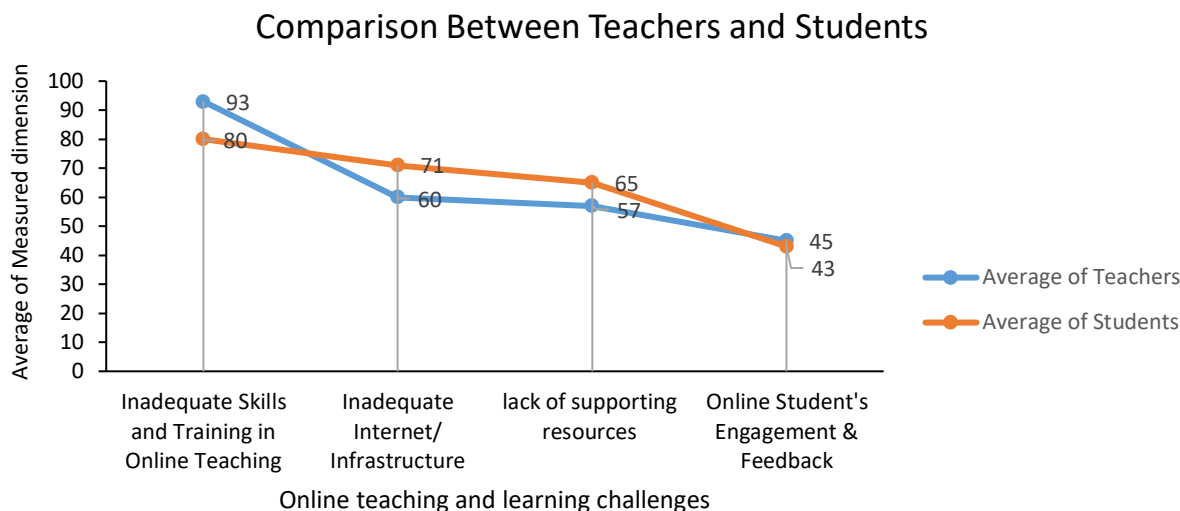


Fig. 5: Teachers and Students Comparison

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.

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