

# VIDEO CONFERENCE SYSTEMS: A REVIW OF EFFECT OF PERCEIVED USEFULNESS AND PERCEIVED EASE OF USE IN ACADEMIA

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## Abstract

*In early 2020, the coronavirus pandemic influence the educational sector in Nigeria and the rest of the world to search for substitutes for the conventional physical classroom learning style. This led to the adoption video conference system such as zoom in academic institutions to facilitate the virtual teaching and learning. This study review literature from 2017 to 2022 on perceived usefulness and perceived ease of use to set the research agenda. The systematic literature review approach was used and 120 journals and conference proceedings were collected and analysed. Results indicate that although the platform is perceived as useful and easy to use, developed countries had wide adoption. Adoption was limited in developing countries like Nigeria due to the factors such as limited electricity supply, internet subscription costs and limited internet service.*

## **Introduction**

Contrary to general belief, the Zoom platform for technology was well-known in academic circles before the global COVID-19 pandemic. There are tutorials that teach how to use Zoom in the classroom, and studies on its advantages in the classroom are well documented. Zoom was recognized as an effective online classroom tool for academic information distribution (Franzak, 2020; Lim et al., 2019; Raza, Abidi, et al., 2018). Many researchers concur that Zoom might be used for distance learning because of its interactive and collaborative features to improve online education. We had no conception how important this technology would become for the entire field of education when a pandemic forced teachers to convert from face-to-face (commonly referred to as "F2F") lessons to an exclusively online platform worldwide (James 2020; Naciri et al., 2020).

After the outbreak of the COVID-19 epidemic and the ensuing government lockdowns, Zoom started to be widely used internationally to teach children in all stages of their academic career, from elementary school to higher education (Naji et al., 2020). The current literature review is focused on the latter. Studies on the subject of online classrooms have significantly increased since the start of the epidemic, and many questions have been asked about the best teaching methods for video conferencing software. This current review of the literature's goal is to assemble and assess the body of knowledge surrounding the use of Zoom classrooms for online learning in universities during the initial COVID-19 pandemic. Before the analysis, a brief history of these areas will be provided.

### **The Global Pandemic**

The World Health Organization (WHO) designated the atypical corona virus a global health emergency on January 30, 2020, after it was first identified in China in December 2019. (Schergers & Diego, 2021; Schurgers & Aina, 2022; Isaac et al., 2019; Di Prima et al., 2020; Nugraha, 2021). It was known that this virus, COVID-19, had severe respiratory symptoms that could be fatal. The virus was rapidly identified as being highly contagious, and by March 7, 2021, more than 116,166,652 individuals had contracted the plague globally, resulting in 2,582,528 fatalities (UNHCR, 2020). Due to the fact that this was declared a global emergency, many nations entered a state of lock-down, including nearly every country in the world, including Nigeria. Citizens were told to stay at home and avoid going out in public. 2020 (Aiyebilehin & Makinde; UNHCR). Schools were ordered to suspend in-person classes as a result of the lock-down, which kept all but essential employees away from their

places of employment (Kreisler et al., 2020). Many universities were forced to figure out new ways to teach students remotely after face-to-face classes were cancelled, and Zoom emerged as a key tool in this process.

### **Zoom Classroom**

Zoom is an online data storage platform that enables discussion, content sharing, and synchronous video and voice conferencing using gadgets like smartphones and computers/tablets (Edwin, 2018). Zoom supports live meetings and may host up to 100 participants at once, thereby turning it into a "online classroom" (Anastasiades et al., 2018). Participants can access Zoom from any location using the meeting room code; all they need is a digital device to access the software and a Zoom account. Furthermore, meetings may be recorded for later review (Setiawan, 2020). Given all these features, it is not surprising that Zoom has quickly become a standard in online learning and that individuals working in the field of education are drawn to its technology (and many more). Zoom is a corporation that sells tools to teachers. Various knowledge applications and unique features have been developed by Zoom to boost its usefulness (and resulting popularity) among those working in the field of education (Rahmi & Frinaldi, 2020).

Following the start of the COVID-19 pandemic, customer use of Zoom increased by 458%, demonstrating the software's widespread acceptance. After the COVID-19 pandemic began in the second quarter of 2020, client use of the Zoom software increased by 58 %, demonstrating the widespread public support for it (Alam et al., 2021; Kayali et al., 2020; A. Naji, 2021). The NPS scale goes from -100 (lowest) to +100, with +62 being considered an outstanding score for Zoom. Furthermore, Zoom's NPS is considerably higher than the sector average of +58, demonstrating better consumer preference. Zoom is a popular tool used by instructors and administrators at universities and colleges to facilitate online learning.

Since technology allows teachers to lecture to an audience of students who are merely listening, Zoom enables synchronous content distribution. In higher education, entire classes can be taught using Zoom. There are many other steps that academic staff can take to facilitate online learning. A good example of this is the "flipped" classroom, in which students complete online exercises or assignments prior to joining the class (through Zoom or another platform) to further discuss and interact with the content (Prima et al., 2020; Pardo-Bunte, 2021). Students gain a lot from an effective zoom classroom, regardless of whether they choose to take lessons online or were forced to do so due to the global epidemic (Sharma

et al., 2020). Educators still require clear direction on the best teaching methods for leveraging some of these tools in an online course as well as a greater understanding of the experiences with using Zoom class rooms to teach in an academic context. This is essential in order to better equip teachers to instruct pupils during and after a pandemic (Zoom is a tool that may be useful in education regardless of the circumstances) (Shen et al., 2019). Teachers need to be aware of how Zoom has been used and how it might be used in the future, both during and after the pandemic, to make the most of it as a resource. The current review of the literature will concentrate on how Zoom classroom was used in an online university context during the COVID-19 epidemic and make suggestions based on broad themes that emerged from the research.

According to researchers (Parra & Granda, 2021; Putu & Pratami, 2021; Setiyani, 2021; Sangeeta, 2020), the field of study of zoom classroom is relatively young, with the quantity of studies rapidly increasing as a result of the rise of the COVID-19 pandemic. Therefore, it is crucial to integrate and solidify the growing amount of knowledge in the zoom classroom. As a result, many research studies on information systems integrate teaching or learning in this area of study (Bekbolatova, 2021; Bhatti & Rehman, 2019; Hartatik et al., 2020). However, no attempts have been made to compile a summary of the cutting-edge IT research technologies as they relate to the zoom classroom and its application. To help academics who want to contribute to this research field, it is crucial to discover studies that have been published in the literature and summarize their findings. a literature review was perform in this study to determine the current state of research on the zoom classroom concept.

It was acquire, analyze, and summarize the most recent findings published in zoom classroom research using a systematic literature review approach. We also provide a comprehensive overview of the state of the field using a mind map of the research themes, methodologies, and theories for zoom classroom. We recommend three review questions for conducting the literature review and achieving the objectives of our study. All of the questions would be useful in developing our search strategies, particularly the kind of information that would be gleaned from the gathered papers. Consequently, for the purpose of performing a literature study on zoom classroom, the following research questions have been developed.

## **RESEARCH QUESTIONS**

1. Which of the major research on zoom classroom are these studies addressing?
2. What ideas and theoretical frameworks are used?
3. What are the constraints and holes in the available research on zoom zlassroom?

Two significant advances to the discipline are made by this work. This study, which examined 120 research publications, provides a thorough understanding of the information systems discipline as well as a list of important classroom themes for academics looking for topics that need more investigation.

The second advantage of this evaluation is that it gives practitioners the most recent information regarding the deployment of online courses using zoom classroom.

This paper has the following format. The Section 2 description of the review's research methodology. The outcomes of this SLR are presented in Section 3. Section 4 provides responses to the research questions. Section 5 also gives the conclusions after discussing the review.

### **Review method**

The systematic review methodology was used in this study to answer the research questions outlined in Section 1. Asiyah (2018) and Diccico (2016) claim that the systematic literature review provides a method for assessing and evaluating the research that is pertinent to a particular subject matter, research question, or phenomenon of interest. They also provide the grounds listed below for conducting a systematic literature review: (SLR).

- I. To summarize the most latest information regarding a technology or a treatment.
- II. To summarize the empirical data regarding to the drawbacks and advantages of a strategic approach.
- III. To highlight the shortcomings in the current study and offer other areas for research.
- IV. To give an outline or context for properly situating future research activity.

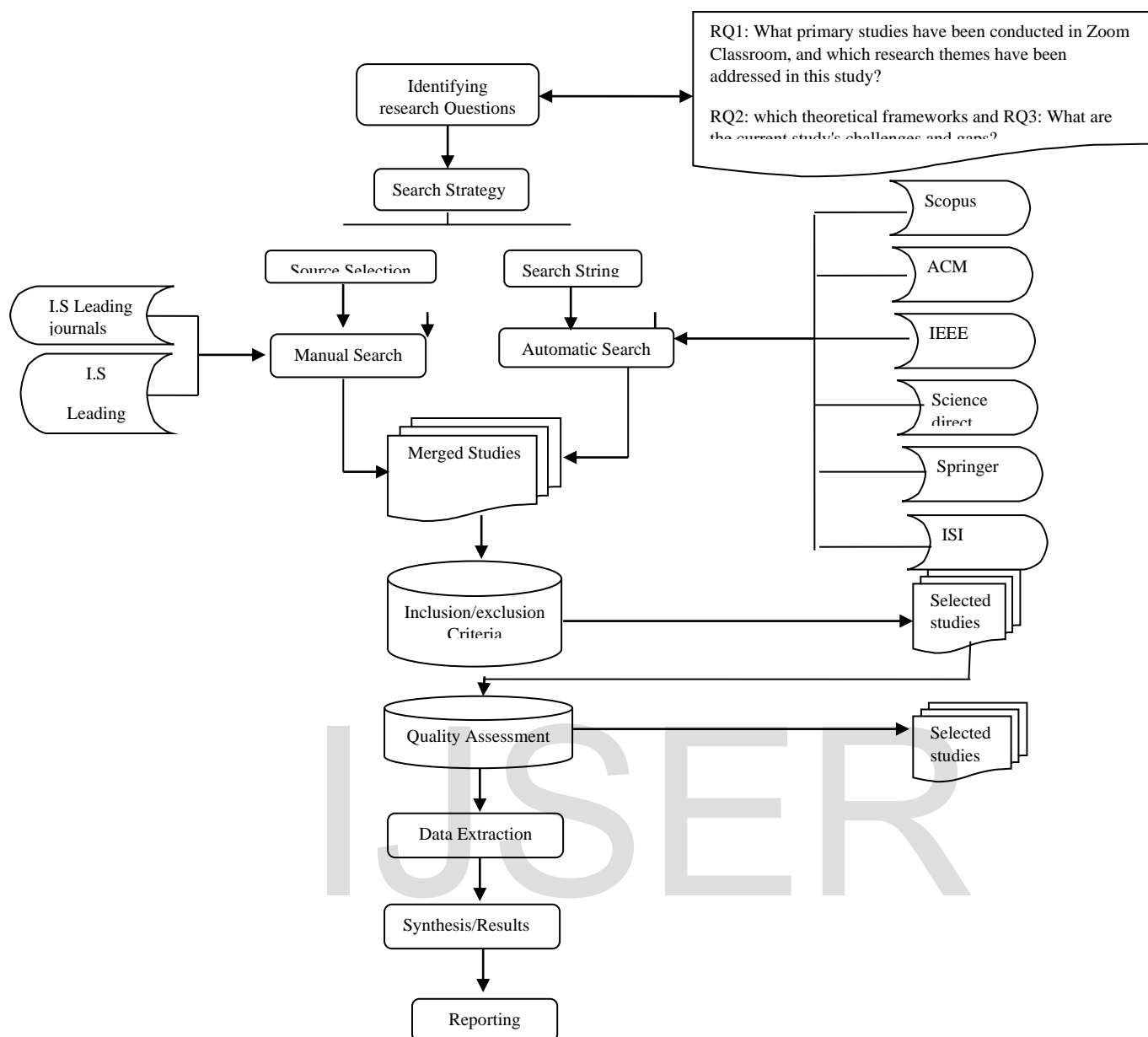
All of the aforementioned factors support the goal of our proposed study, which will follow all of the recommendations made by Asiyah (2018) and Diccico (2016) as well as a three-step review process that includes planning, conducting, and documenting. The following tasks are included in each step: (1) identifying the research question; (2) establishing the review protocol; (3) defining the inclusion and exclusion criteria; (4) looking for methodologies; and (5) analyzing the selection process. (5) Executing a quality assessment process; (6) Executing data extraction and synthesis. The following sections go into further depth about these activities.

### **Review protocol**

The protocol of this systematic review starts with the key factor of identifying the review procedure, and it highlights the research topics to be addressed as well as the review methodology (Asadi et al., 2017, 2019). A pre-established protocol also minimizes the

possibility of researcher bias. The major points of any protocol include the context of the study, establishing the research questions to be addressed, selecting the study selection criteria and procedures, assessing the study's quality, developing a strategy for data extraction, and synthesizing the extracted data. This study review literature from 2017 to 2022 on perceived usefulness and perceived ease of use to set the research agenda and the review procedure utilized in this research is described in Fig. 2.

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**Fig 2:** Review Protocol.

### **Inclusion and exclusion criteria**

Only the most significant articles are used in the SLR approach according to the procedure of inclusion and exclusion criteria. Journal publications, conference papers, book chapters, and symposium reports from related fields are taken into consideration as this study focuses on comprehending the zoom classroom research. The terminology "zoom classroom" is used for the first time, followed by perceptions of its usefulness and ease of use, with learning motivation following last. Additionally, there were not many papers that utilized the term "zoom classroom" published in 2019. Because the initial publications were published during that time, we regarded that year as the start of the entire literature review. Additionally, we noticed that up until the discovery of a special COVID 19 pandemic issue, the function of Zoom Classroom had been largely ignored. After that, additional academics started concentrating on the essential role that IT plays in teaching and learning via Zoom Classroom.

### **Search strategy**

The search strategy has a big impact on the methodical extraction of studies published in any literature review. It is fundamental to choose the search criteria to be applied when gathering the pertinent studies and carrying out the study, as well as the search phrases to be used (Saepudin., 2020). The automatic and manual stages make up the two steps of the search approach. The automatic stage aids in locating studies pertaining to Zoom Classroom. In this study of the literature, we first looked at the 35 publications from the senior scholar basket (Journal of the Association for Information Systems, Information Systems Research, Journal of Management Information Systems, Information Systems Journal, Decision Support Systems, Journal of Strategic Information Systems, and the European Journal of Information Systems). If it was decided that they were significant and valuable for this study, additional studies from other conferences were also included. It was noted that there weren't many studies published in reputable journals that were relevant to the zoom classroom industry. As a result, it was widened the scope of the search to accommodate papers from more publications and conferences. it was specifically searched for pertinent studies in the Journal of Information Technology, Journal of Strategic Information Systems, Communications of the Association for Information Systems, Information Systems Frontier, Information Systems Research, Information and Management, Australian Journal of Information Systems, and the Academy of Management Journal in accordance with the suggestions made by the Journal of Computer Information Systems (Denise & Polit, 2006). The Association for Information



Systems (AIS) e-library ([www.aisnet.org](http://www.aisnet.org)), one of the largest portals for IS studies, was also looked through for further studies. The same process that was used to search the journals was followed by each other. The IS conferences proceedings were selected based on the conferences that received AIS support. In order to do this, the conference proceedings from the Hawaii International Conference on System Sciences (HICSS), Australian Conference on Information Systems (ACIS), Pacific Asia Conference on Information Information Systems (PACIS), and American Conference on Information Systems (AMCIS) were examined (PACIS). The following keywords were used in this study to find pertinent papers: learning motivation, perceived utility, and usability of zoom classroom. To track the citations of the chosen books, the next phase was a manual search using the backward and forward search methods (Raza, Umer, et al., 2018; Lang & Hu, 2017; Xue & Xin, 2016). Using the Google Scholar search engine, the forward search and finding the papers cited in the first selected papers were both completed. The manual process contributed to the systematic research's thoroughness and completion (Shen et al., 2019). We also organized and sorted the documents using Mendeleyev, a reference management application. This preserved the search results and eliminated duplicates.

### **Study selection process**

Basically, the selection process' primary objective is to find the pertinent papers for the literature review. The primary search was carried out through the chosen outlets using the search stream described in the preceding section. The automatic search produced 150 research publications from the initial search. Then, based on each paper's abstract and conclusion section, we applied the inclusion and exclusion criteria. This action got rid of 20 papers. Following their advice, we eliminated all studies that had no connection to the in this step and applied the full-text scanning technique for the research that remained while taking the exclusion criteria into account. Moreover, discovered the missing reports through the manual procedure for each paper's reference section. This allowed for the discovery of 10 additional studies. In the end, 120 papers were found to be the total number. After 30 studies are eliminated using the quality assessment criteria, 120 publications are ultimately selected as the final collection of primary reports.

### **Quality assessment (QA)**

Making a recommendation on the overall caliber of the research papers is the major goal of the quality assessment. This allowed us to determine the extra criteria for the review (Asadi et al., 2019). The quality instruments, which included the parts and questions that were to be

utilized for each report on the checklist, are the foundation of the quality assessment (QA) (Barbara Kitchenham et al., 2009; Turner et al., 2010). As a result, four QA criteria are being designed for this investigation, and they are as follows:

QA1: Is the topic that paper discusses connected to Zoom Classroom?

QA2: Has the paper provided a description of the research methodology?

QA3: Is the scenario in which the research was conducted sufficiently described?

QA4. Are the goals of the research stated in a straightforward manner?

The evaluated quality of each article that was assigned a Yes (Y), Partly (P), or No (N) quality level based on the QA criteria given above. 30 research were discovered to not meet the criteria during this procedure, and as a result, they were removed from the final list. According to the QA criteria of (Nidhra et al., 2013), the primary studies for this SLR consisted of a total of 120 publications; the majority of the remaining research earned quite high scores in these QA criteria.

The questions were scored as follows:

QA1: Yes, the study explicitly states the inclusion criteria; P (partially); N (no), the inclusion criteria are not stated and cannot reasonably be inferred.

QA2: Y, the author have either located and cited all papers covering the subject of interest or they have searched four or more digital libraries and used other search techniques; P indicates that the authors have searched three or four digital libraries without using any additional search techniques, or they have searched a defined but limited set of journals and conference proceedings; N indicates that the authors have searched no more than two digital libraries or a very small number of journals.

QA3: Yes, the authors carefully specified the quality standards and used data from each primary study; P, the study focuses on problems with the research question's quality; There hasn't been any attempt to specifically assess the quality of any one primary study.

QA4: Each research's information is offered, however just a summary of the primary studies' findings are given, and the specific findings of each primary study are not stated.

S/N	QA1	QA2	QA3	QA4
1	Y	Y	Y	Y
2	Y	N	N	Y
3	Y	N	Y	Y
4	Y	Y	Y	Y
5	Y	N	Y	Y
6	Y	Y	Y	Y
7	Y	N	Y	Y
8	Y	N	Y	Y
9	Y	Y	Y	Y
10	Y	N	Y	Y
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113	Y	N	Y	Y
114	Y	N	Y	Y
115	Y	N	Y	Y
116	Y	N	Y	Y
117	Y	N	Y	Y
118	Y	N	Y	Y
119	Y	N	Y	Y
120	Y	N	Y	Y

### Data extraction and synthesis

The major goal of this step is to create the data extraction form so that the information the researcher gleaned from the preliminary studies may be accurately recorded. After carefully reviewing each of the 150 papers, the technique is carried out by using Mendeleyev and Microsoft Excel spreadsheets to extract the pertinent data. This phase's major goal is to create data extraction forms that accurately record the information collected from the primary research (Kitchenham et al., 2007). The following columns in Microsoft Excel spreadsheets are considered for this review: Title, Reference, Study ID, Authors, Year of Publication, Study Aims, Theory/Framework, Data Collection Method, Data Analysis Method, Results, and Limitations. The articles were all selected with the review's objectives and research questions in mind.

### Publication source overview

A total of 120 studies are chosen for this study. These works were divided into 111 journal articles, 5 conference papers, 3 book sections, and 1 thesis. This number demonstrates that publications have been gradually increasing over time. Consequently, more papers are published in journals throughout the pandemic to uncover more e-learning-related solutions,

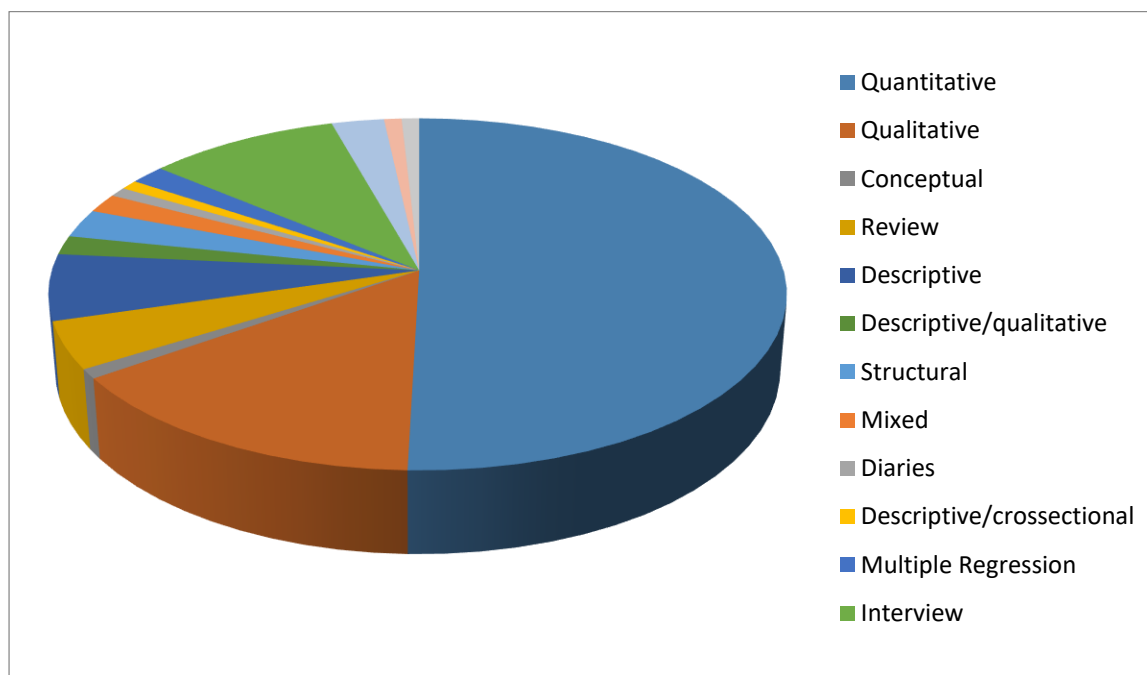
which prompts a growth in research in 2021. highlighting the publications' goals using key phrases from their titles and abstracts. The primary focus of the chosen research has been on how learning motivation is influenced by perceptions of the usefulness and ease of use of zoom classroom.

### Citation status

The overall citation rates of the included papers are quite high, which is a sign of the importance and high caliber of the research. Over 50 citations from different sources are included for about 29 chosen papers. In addition, 29 studies received citations between 20 and 50 times, while 11 received citations between 10 and 20 times. Additionally, 23 research had no citations and 58 studies had fewer than 29 citations. However, given that several of the publications were just released in 2019 and 2020, it is unlikely that they will accrue more citations in such a short amount of time.

### Research methodologies

The research approaches employed in the preliminary studies are all shown in the figure below. This figure shows that several of these research employed quantitative technique, and a number of them were survey-based. According to the graph, 5 studies were reviews, 3 were structural, 17 studies were qualitative, 11 were descriptive/qualitative, and 50% of the reports were quantitative. Two of the studies used a mixed technique, two used multiple regression, and one used a diary that was descriptive and cross-sectional, according to the distribution shown in the figure. The methodology sections of the remaining 31 research, however, did not explicitly state which technique they had employed.



**RQ2:** What ideas and conceptual frameworks are used?

The researchers have used a variety of frameworks and theories due to the diverse nature of information systems study. It is shown that the vast majority of the theories used in the primary research for this study were based on theories at the educational level, whereas very few studies used concepts at the individual level.

The most widely applied theory at the information system level is the Technology Acceptance Model (TAM) theory. Institutional theory emphasizes the importance of the institutional environment in determining organizational structure and behavior. To investigate institutional environmental behaviors, TAM theory has been applied (Chen et al. 2008; Campbell 2007). Orlikowski (2009) claims that people make sense of the technology, gather the resources needed to incorporate it into work processes, business activities, and strategies, and execute the improvised actions necessary to assimilate it using these signification, legitimization, and dominance structures. The second-most common theory is called the Unified Theory of Acceptance and Use of Technology (UTAUT). The papers included in this study continued the trend of earlier studies, which used TAM to explain how IT functions as a key organizational resource to help high-performing institutions (Pardo-Bunte, 2021; Wade & Hulland, 2004). For instance, Nishant et al. (2013) used TAM to investigate the connection between environmentally friendly IT practices and performance. In a different study, Rahman et al., 2020, evaluated the benefits of Zoom Classroom from the perspective of a resource-based view of the business. When evaluated from an individual basis, the Unified Theory of Acceptance and Use of Technology was the most prevalent stance (UTAUT). The UTAUT is a theoretical framework that explains how people make decisions. One of the most prominent rational-choice models is this one (Han et al., 2021). The Unified theory of acceptance and use of technology was the most widely accepted hypothesis from a personal perspective (UTAUT). The UTAUT, one of the most prominent rational-choice models, is a conceptual framework that explains how individuals make decisions (Han et al., 2021). UTAUT was additionally employed by Mishra et al. (2014) to gauge professionals' opinions of various zoom classroom strategies. One significant theoretical finding from this study was that the UTAUT constructs could well account for the enormous variation in the intents of the professionals with regard to IT efforts. According to the applied theories in the main research in this publication, the majority of the researches addressed TAM and UTAUT theories while very few studies applied individual level theories.

**RQ3: What are the constraints and limitations in the available research on Zoom Classroom?**

Numerous studies have been analyzed in this study in order to highlight the current understanding of zoom classroom, which has developed as a new technology and is attracting increasingly greater attention from governmental, institutional, business, and individual sides. However, some disciplines' present bodies of knowledge for Zoom Classroom are still somewhat restricted. Therefore, there is a need for a deeper comprehension of zoom classroom's complex character. The tactics and approaches that institutions can use to enhance their teaching and learning environments are quite important. In addition, few research used the mixed method and literature review approaches from a methodological perspective. It's possible that further literature review studies might be beneficial for this field of study.

Despite the fact that there have been numerous studies on zoom classroom and its implementation, there is still a significant gap in the literature on the topic (Bupalan et al., 2019; Bose & Luo, 2011), as only a small number of studies give theories about how to use zoom classroom (Tushi et al., 2014). In addition, there is a need to recognize and comprehend each individual's motivations and behaviors for zoom classroom in addition to the institutional elements (Hasan & Dwyer, 2010). However, the majority of earlier research was on educational level, while inadequate exploration of the individual level. Furthermore, as this article noted, the majority of studies concentrated on the initiation, adoption, benefits, tactics, and approaches, whereas a greater emphasis on the implementation of zoom classroom in the educational sector is required.

### **Discussion and conclusions**

This paper gave a summary of current studies on zoom classrooms. The usage of zoom classroom research is addressed by three questions using a systematic review methodology. The review included reports that were recently released between 2017 to 2022, 120 studies concentrating on zoom classroom are chosen after applying several methodological approaches. The other studies couldn't meet the inclusion criteria, hence they weren't included in this review. After data analysis, the various research approaches utilized in these research were recognized and categorized. According to the review's findings, adoption was limited in developing countries like Nigeria due to the factors such as limited electricity supply, internet subscription costs and internet service (Franklin et al., 2022; Etodike et al., 2022; Adeoye et al., 2020). However, the results further shows that quantitative approaches are the most widely used (with 50%), followed by qualitative methodologies (with 15%). Overall, after reviewing every publication that has been published, we can draw the

conclusion that limited electricity supply, internet subscription costs and internet service are the key issues that led to the limited adoption of zoom classroom in Nigeria. Therefore practitioners and researchers might both benefit much from the study of zoom classroom projects. Our observations can serve as a foundation for academics and aid them in identifying new study opportunities on zoom as zoom classroom research as it is a relatively young topic.

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