

# ***Visual Analysis of the Development of Online Learning Effects of Domestic and Foreign College Students in the Field of Education***

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**Abstract:** Technology in learning has skyrocketed especially through online learning, which has opened a gateway for students around the globe. The purpose of this research is to identify the trend of online learning and its impact on college students' learning achievements concerning domestic and foreign literature. The current study aims to use bibliometric analysis by engaging CiteSpace on data from the Web of Science (WOS) database between 2020 and 2024 to identify the research tendencies, key contributors, and topic areas. Some trends that emerged indicate topics including "academic self-efficacy", "higher education", and "barriers" where there was more focus on status, equity, access, and success. Global student mobility and policy trends are analysed in global studies; domestic issues such as the gender gap and socio-economic disparities are explored in domestic work. The paper also ends by stressing the idea of inclusive education systems and offering an application of recommendations for improving the effectiveness of online education for policymakers, educators, and other institutions. These findings also help to narrow the existing gap between the global and the local systems to provide fair and meaningful access to higher learning.

**Keywords:** Online Learning Development, College Students' Educational Outcomes, Global and Domestic Comparisons in Education.

## **1. Introduction**

Higher learning education has embraced the advancement of technology in a way that has been revolutionised by online learning. This is a revolutionary model of learning that has privatised knowledge, classified ways of learning and redefined the position of technologies in influence. However promising, the delivery method of online learning poses certain issues, especially in evaluating the effectiveness of its delivery on the students' learning achievements. They postulate that these challenges hold variations of the socioeconomic settings, educational facilities, and cultural aspects of online learning environments between domestic and international settings. It therefore is important to understand these dynamics to narrow the gaps in the identified areas and enhance the design and delivery of online learning systems especially for diverse categories of students.

### ***1.1. Background of the Study***

Online learning education in higher learning institutions has been propelled by

advancements in technology and disruptions most preferably by the COVID-19 pandemic. As pointed out by UNESCO (2023), due to the pandemic about 1.6 billion students are out of their physical classes, and educators and students are adopting online and blended learning systems. With the rise in enormous access to the internet, learning platforms like Coursera, edX and Canvas experienced the growth of their user base, which marked a turning point in education delivery and consumption (Garrison & Vaughan, 2008). To college students, the shift in learning has positive impacts especially concerning participation learning motivation, and performance as pointed out by Bao (2020). According to Adedoyin and Soykan (2023), technological ease, economic and policy disparities, and policy environment affect online learning programmes in domestic settings. At the same time, the experience of other countries indicates cultural attitudes towards online education and the implementation of global trends in technology (Zawacki-Richter et al., 2019). Seemingly, previous works have focused on either of these areas separately, but none has sought to situate a domestic or foreign analysis to the other concerning the emergence of online learning as well as what impacts it has on the educational achievements of college students. This study plans to fill this gap using a bibliometric review which provides a tour through the currents and eddies of the field.

## *1.2. Problem Statement*

Although there is an increase in student enrolment in online classes in Universities across the globe, there is a research gap in the global literature regarding how the outcomes of online learning among college students vary between domestic and international settings. A lot of the current literature is prescriptive, contextual and discipline-specific and lacks the comparative approach that is necessary in framing global education policies (Castro & Tumibay, 2021). In addition, there are relatively few bibliometric studies in this area and therefore one cannot identify basic trends, leading scientists and emerging topics in the field. Failing to get such information, several policymakers and educators were not well equipped to develop the right online learning systems that enable students from around the world.

## *1.3. Aims and Objectives*

This research questions seek to find out the following: The evolution and effects of online learning on college students' academic performance, a comparative analysis of domestic and international scholarship. The specific objectives are:

- To identify and analyse research trends and thematic focuses in studies on the effects of online learning on college students' educational outcomes in domestic and international contexts.
- To examine the citation patterns, influential researchers, and leading institutions in domestic and international studies on online learning development in higher education.
- To compare the conceptual and methodological approaches used in domestic and foreign studies on the impact of online learning on college students' educational outcomes.

## *3.4. Significance of the Study*

This research bridges the gap in the available literature on educational research

by providing an orderly, methodical approach to studying the effects of online learning on students learning in college. The study benefits scholars, policymakers, and practitioners through the articulation of key trends, authors, and methodologies in the research. The implications for domestic stakeholders are that the findings can enhance the formation of societal-relevant online learning plans that can meet local difficulties in relativity to distances, technology, and other resources. To the global viewers of the study, it provides a sample of best practices and trends in the cultural and educational environment that can be applied in other cultures. At long last, this research intends to fill gaps and disparities whether domestic or international for enhanced prospects of online learning systems that can create a unified and synergistic movement for higher learning education age of digital learning.

## **2. Literature Review**

In this section, the author presents the state of the art concerning the study's objectives as well as the main themes, citation practises, and research methodologies in the field of online learning. Since the review is based on the identified research objectives it considers both global and domestic views and in the end the paper pointed out theoretical frameworks and research gaps that justified the study.

### *2.1. Research Trends and Thematic Focuses in Studies on Online Learning*

Due to its growth, there are various areas of research interest which have included the development and implementation of online education as well as the effect of online education on students. International patterns are focused on such topics as students' activity, technology, and pedagogical paradigms (Zawacki-Richter et al., 2019). For instance, Garrison and Vaughan (2008) affirms how the Community of Inquiry (CoI) plays a critical role in the design and implementation of online courses, that embrace cognitive, social, and teaching presence. In domestic environments, concerns classical topics, for instance, the ability to use information and communication technologies (ICTs) or the so-called digital divide (Adedoyin & Soykan, 2023). The analysis of investigations conducted on developing nations of sub-Saharan Africa and South Asia found that due to poor Internet connexions and ineffective educational infrastructure (Bozkurt et al., 2020). On the other hand, in developed countries including North America and Europe, different researchers agree that the use of blended learning enhances the achievement of educational goals (Bernard et al., 2014). Another development has also occurred at the thematic level due to crises across the world. For example, the COVID-19 outbreak is one event that has led to the study of the responsiveness of e-learning systems and the mental impact that online learning has on learners (Bao, 2020). Nevertheless, considerable advances have been achieved in achieving these goals To date, few bibliometric reviews compare domestic research with the international literature pointing to the common factors and regional distinctions.

Research has used various methods in analysing the strengths and weaknesses of online learning. Experimental research designs are common in quantitative designs to determine academic performance, while data gathering focuses on student perception and experience (Sun & Chen, 2016). Synchronous and combined quantitative and qualitative research methods, surveys, interviews, and data analysis are becoming more popular (Means et al., 2009). However, comparative research is still very limited

and there has been little research on employing bibliometric tools to compare global and local views.

## *2.2. Citation Patterns and Influential Researchers in the Field*

This bibliometric study identifies frequent authors and citation patterns that have defined the field of online learning. For instance, Zawacki-Richter et al. (2019) conducted a systematic literature review of 2727 empirical studies published over two decades and found that North America, Europe and Asia were areas of high research activity. In a similar vein, Mann (2003) has continued to be popular with the paper on blended learning to bring face-to-face and distance learning contexts closer. More locally, scholars such as Adedoyin and Soykan (2023) question the digital divide and teaching and learning dissemination of online learning in poorly resourced settings. On the other hand, current global scholars such as Garrison and Vaughan (2008) favour hauntological paradigms that can be replicated in any environment. Reference lists also demonstrate the broad disciplinary focus of the online learning literature including educational technology, psychology, and computer science. For example, artificial intelligence application in online education is an emerging topic for research that has focused on its effectiveness in customising learning environments (Zawacki-Richter et al., 2019). However, no bibliometric studies compare domestic and international contributors to fill the knowledge gap of the global distribution of research impact.

Co-authorship networks and citation mapping are deemed effective in analysing cooperation profiles and outstanding works. For instance, CiteSpace analysis revealed certain geographical areas and organisations' biases towards online learning research (Chen, Ibekwe-SanJuan & Hou, 2010). Still, few systematic comparisons between domestic and international stages are offered, which prevents attention to the general tendencies of the research and cooperation.

## *2.3. Conceptual and Methodological Approaches in Domestic and International Studies*

Previous studies of online learning use various conceptual and methodological frameworks, which may be influenced by geography. In residential contexts, common research areas of concern include accessibility and cultural dispositions. For instance, Adedoyin and Soykan (2023) point out that students in developing countries struggle to learn online because of the poor internet connection and lack of sophisticated technology in that context. On the other hand, international research tends to focus on norms standards and principles of good practice. For example, the Community of Inquiry (CoI) framework has been popularised within the context of global studies to evaluate the effectiveness of online instructional environments (Garrison & Vaughan, 2008). Others, including Technological Pedagogical Content Knowledge (TPACK), work in assessing the integration of technology in teaching (Mishra & Koehler, 2006).

Out of all students, quantitative research findings predominate in the subject area, especially regarding academic achievement and the efficiency of technology handling (Means et al., 2009). Study designs like case studies and interviews are also typical as they focus on students' experiences and their views about them (Sun & Chen, 2016). However, although MMRA designs are being accepted more frequently, given

the complexity of online learning environments, MMRA designs provide an optimal way of capturing the overall picture. However, there remain very few comparative assessments of domestic and international studies that would systematically address the methodological divergence.

#### 2.4. Theoretical Framework

The theoretical foundation of this study is based on the Community of Inquiry (Col) framework which acts as a dynamic model that describes Online Learning Collaboration. Developed by Garrison, Anderson and Archer (1999), the Col framework emphasizes three interdependent elements:

- **Cognitive Presence:** The degree to which learners can build and negotiate meaning individually and interactively through thinking and talking.
- **Social Presence:** This is referred to as learners' social and emotional realised fictional capital which is the extent to which learners can project themselves socially and emotionally in a learning community.
- **Teaching Presence:** Coordination of learning-related mental and social activities to generate significant learning objectives.

The Col framework is especially ideal for this study since it covers both domestic and international as more frameworks and offers a universal method of evaluating the quality of the online learning environment. Besides, the study employed some principles of bibliometric theory to analyse scholarly publications to discover patterns of pattern, association and trends (Chen et al., 2010). These two theoretical frameworks make it enable us to cover most of the aspects of the research domain.

#### 2.5. Literature Gap

There are some gaps in the literature regarding online learning although there is a rapidly increasing literature on the subject. To the author's knowledge, there is almost no prior research that systematically investigates the impacts of online courses on students attending college across domestic and international settings. It is this kind of gap that makes it difficult to generalise data and, therefore, policies across nations. Of course, the technique of bibliometric analysis has been used in other disciplines far more frequently than in the realm of online learning research. This hampers the possibility to determine leading topics, active contributors, and areas with a lack of studies. Domestic studies regularly concentrate on specific issues like the digital divide whereas international studies reveal generalised frameworks. It is evident that current research does not directly explore the relationship between these dual perspectives, and this research therefore proposes to undertake research that fuses the views.

However, there are few mixed-methods research while both quantitative and qualitative research are dominating the field. Also, insufficient evidence examines the potential of systematic methodological variations between domestic and international research methodologies. This study sought to fill these research gaps to present the development of online learning and the effect of online learning on college student's educational performance logically and methodically and make theoretical and practical progress.

### 3. Research Methodology

To enable the researcher to achieve the research objectives of this study, this chapter identifies the research methods used in undertaking this study. As the principal methodology of the study, bibliometric analysis provides a quantitative assessment of trends, patterns, and gaps in the literature on online learning development and students' educational attainment in colleges. The paper also explains the methods used in data collection and analysis as a way of providing an account of the research questions.

#### 3.1. Research Method and Design

This particular work employs only secondary data securities which analyse and gather research patterns and trends from published literature. Secondary research is well aligned with this study because it enables consideration of a myriad of published information, which in turn makes it possible to assess thematic areas, leading scholars and methodological variations in cross-domestic/ international settings (Zupic & Čater, 2015).

Bibliometric analysis is a quantitative research method used to analyse and map publications; it is used in the current study. Bibliometric analysis is especially important in identifying the development of fields or contexts, tendencies in co-authorship, and citation practises, as well as knowledge gaps (Chen et al., 2010). Specifically, this study uses bibliometric tools like CiteSpace to:

- Analyse keyword co-occurrence patterns to identify dominant research themes.
- Map citation networks to determine influential authors, articles, and institutions.
- Compare domestic and international research trends, focusing on the development of online learning and its impact on college students' educational outcomes.

The method used bibliometric analysis, corresponds to the study's aims and objectives of giving a general framework of the research area and distinguishing between the national and international methods and concepts.

#### 3.2. Data Collection Techniques

For this study, data was obtained from the Web of Science: an international bibliographic database offering substantial coverage of peer-reviewed articles, conference papers, and books. Thus the choice of Web of Science is based on its database of the broad coverage of multidisciplinary research, advanced search options and compatibility with bibliometric software (Bar-Ilan, 2019).

To include the newest information and latest trends, only articles that were published between 2020 and 2024 are included in the study. This time frame guarantees that the paper incorporates articles discussing the increased use of online learning occasioned by COVID-19 and the resultant advancements in the sector.

##### 3.2.1. Inclusion Criteria

The following criteria were used to select relevant articles:

- Articles published in peer-reviewed journals indexed in Web of Science.
- Articles focusing on the development of online learning and its effects on college students' educational outcomes.
- Articles with keywords related to the study's objectives, as listed in the table below.

### 3.2.2. Keywords for Article Selection

To ensure comprehensive coverage, the following keywords were used to search the Web of Science database:

Table 1: Primary and Secondary Keywords.

Primary Keywords	Secondary Keywords
Online learning development	Educational outcomes
College students	Online education impact
Global comparisons in online learning	Domestic online education challenges
Higher education	Digital learning in higher education
Bibliometric analysis in education	Research trends in online learning

### 3.2.3. Search Strategy

- The keywords were combined using Boolean operators (AND/OR) to refine the search results. For example, searches such as “online learning development AND educational outcomes” or “college students AND bibliometric analysis” were conducted.
- Filters were applied to limit the results to articles published from 2020 onwards and to peer-reviewed sources only.
- A preliminary search yielded numerous articles, which were further refined using the inclusion criteria.

### 3.3. Data Analysis Method

Bibliometric analysis was conducted using CiteSpace, two widely used tools for mapping and visualizing bibliometric data. The analysis consisted of the following steps:

#### 3.3.1. Data Preparation:

- The selected articles were exported from Web of Science in plaintext format.
- The data was cleaned to remove duplicates and irrelevant records, ensuring a high-quality dataset for analysis.

#### 3.3.2. Keyword Co-occurrence Analysis:

- Using CiteSpace, a keyword co-occurrence analysis was performed to identify dominant research themes.
- Keywords were grouped into clusters based on their co-occurrence, revealing major research focuses such as “student engagement,” “digital divide,” and “pedagogical frameworks.”

#### 3.3.3. Citation Analysis:

- Citation networks were analysed to identify influential authors, articles, and journals.
- A ranking of the most cited works in both domestic and international contexts was generated.

### 3.3.4. Co-authorship Analysis:

- Co-authorship patterns were mapped to identify collaboration networks among researchers and institutions.
- The analysis highlighted key contributors and regions dominating the field.

### 3.3.5. Thematic Mapping:

- CiteSpace was used to create thematic maps showing the evolution of research themes over time.
- Burst detection was employed to identify emerging trends in online learning research.

### 3.3.6. Comparison of Domestic and International Research:

- The analysis compared domestic and international studies based on citation patterns, thematic focuses, and methodological approaches.
- Differences in research priorities and challenges were identified.

## 3.4. Ethical Considerations

Since this study is based on secondary data, ethics majorly consisted of proper citation practises and references to copyright information. Each of the articles was obtained through institutional access to a web of science, no personal or sensitive information was included.

## 4. Results

### 4.1. Online Learning Development

The trends and keywords identified using the bibliometric analysis with assistance from CiteSpace provide substantial insights into the domain of online learning for domestic and overseas college students. In the frequency table provided below, important keywords that acted as influencers include 'online learning', 'education', 'professional development', and 'academic results'. These keywords define the topical interest in understanding the consequences of online learning on students' performance. The reappearance of authors including Bandura A and organisations like the United Nations indicates their significant roles in the overall literature on distance education.

The clustering map (figure 1) also offers a thematic grouping of areas of study with such areas as 'academic self-efficacy,' 'higher education,' and 'community colleges' being closely related concepts. Such terms as 'academic outcomes' and 'college students' are examples of clusters that suggest the topics of interest in the research field. The wider thickness of nodes and edges shows the highly cited papers and their interaction; locations, where prolific collaboration between scholars exists, reveal shared research emphasis.

In Table 1, the centrality values such as the degree centrality (0.53 for "online learning") indicate that the keywords and concepts are important linking pins between





The map visualises (in Figure 2) a tight web of interconnected keywords like ‘academic self-efficacy’, ‘community colleges’, and ‘higher education’ at the centre of the web. The clusters exhibit connections between the studies of college students’ educational effects with links to ‘behaviour,’ ‘youth,’ and ‘barriers’ fields. Such clustering as, for example, “Academic outcomes” and “College students” puts the gender-constructing institutional and individual factors informing educational pathways into similar categories.

Table 3: College Students’ Educational Outcome.

Count	Central...	Year	Cited Authors   Cited Refer...
19	0.11	2020	UNKNOWN -
10	0.24	2022	higher education
9	0.14	2023	performance
7	0.32	2020	BANDURA A
5	0.00	2022	students
5	0.03	2020	KUH GD
5	0.24	2021	college students
5	0.15	2020	ADELMAN C
4	0.13	2020	HU LT
4	0.16	2020	XU D
4	0.08	2022	achievement
4	0.03	2020	SHAPIRO D
4	0.12	2021	health
4	0.12	2020	PASCARELLA ET
4	0.07	2020	GOLDRICK-RAB S
4	0.12	2020	MUSEUS SD
4	0.12	2024	education
4	0.00	2023	experiences

In Table 2, the centrality scores mean (0.24) that the working themes like ‘performance’ and ‘college students’ are the important bridging themes for identifying the various research clusters, which suggests their importance in the research domain. Parts of the terms, including ‘health’ and ‘educational attainment,’ mean that students’ overall development is now being considered in the development of programmes and policies.

The Chrono structure analysis also shows that there is a gradual development of research topics, from liberal discussions of “students” and “achievement” in earlier years to fine-tuning with variables such as “health” and “community college”. This shift is different as it indicates an increased focus on novel macro-framework factors that affect the effectiveness of online learning. These findings are in line with the research objectives since they present an overview of trends, key players, and methodologies related to college students’ educational outcomes, which may be followed by a comparison of the domestic and foreign results.

### 4.3. Global and Domestic Education Comparison

Conventional keyword-based mapping analysis of global education and domestic education shows thematic trends in the form of higher education, international students, and university policies, which are suited to make a comparative analysis of global and domestic educational achievement. According to the frequency table, the most occurring

words are, higher education, students, and domestic violence some important authors participate in the discussion such as Harvey David and organisations like UNESCO. An impressive centrality score of “education” (0.59), in Table 3, demonstrates that it serves as the link between the majority of the research topics identified.

Table 4: Global and Domestic Educational Comparison.

Count	Central...	Year	Cited Authors   Keywords
28	0.59	2021	UNKNOWN -
10	0.23	2021	education
6	0.43	2023	higher education
5	0.24	2021	domestic violence
4	0.25	2023	HARVEY DAVID
4	0.15	2021	intimate partner violence
4	0.29	2021	students
4	0.09	2021	university
3	0.00	2023	international students
3	0.00	2023	FOUCAULT MICHEL
3	0.04	2023	UNESCO
3	0.32	2021	experiences
3	0.08	2024	study abroad
3	0.03	2023	MEYER JW
3	0.02	2024	programs

Figure 3: Global and Domestic Education Comparison.



Analysing the results of the cluster map (figure 3) visualisation, it is possible to notice clusters as global and local education concerns, like 'international students', 'cosmopolitan', 'study abroad', 'domestic students', 'gender', and 'achievement'. This differentiation is the result of a comparative analysis of educational frameworks, considering mobility in the academic environment and local difficulties faced by educational institutions.

Some major cores such as 'higher education,' and 'university policy' suggest that organisational structures and policy changes have a great influence on the attempts to close this gap between global education and domestic education. That is why, for instance, such terms as 'migration' or 'education policy' exist; cross-border educational mobility and innovative changes in policies are becoming decisive in the development of the international educational space. This is evidenced by the emphasis on 'intimate partner violence' and 'domestic violence' within the domestic cluster and the socio-cultural as well as personal aspects thereby included in education but not characteristic of global education. The observed layout of the cluster map points to a further increase in the part of the focus on the connection between the global and national contexts on the example of international education and personal identity, the preparedness for self-employment, etc.

These perceptions support the research objectives by pointing to the methodological and conceptual differences between international and local education research. These trends help policymakers and educators gain an understanding of how effective strategies could be proposed for enhancing learning to children in both contexts with a specific understanding of the challenges and opportunities of such undertakings towards creating an equitable educational environment across the world.

## **5. Discussion**

The bibliometric analysis of selected articles in this research yields significant information about trends, authors, and topics within the domain of online learning crucial to the advancement of the field of online learning and the achievement of college students. The findings presented in this study support the asserted research objectives and coincide with the literature discussed in this research.

### *5.1. Online Learning Development*

The outcome highlights the trends of shifting attention towards the flagship potential of online learning in improving academic performance, as analysed in the literature (Garrison & Vaughan, 2008; Zawacki-Richter et al., 2019). Some of the major keywords that were identified in the bibliometric analysis include "academic self-efficacy", "higher education", and "community colleges" which support earlier research on self-efficacy and institutional support for facilitating purposeful online learning (Bandura). The chronological analysis of publications indicates an evolution from general conversation topics to equity and accessibility-subjected topics, which aligns with the findings of Adedoyin and Soykan (2023).

### *5.2. College Students' Educational Outcomes*

Technical themes like "achievement", "health" and "academic performance" stress the complexity of effects that online learning has on the occupants in accord with other studies that have pointed to the idea that education impacts both the academic and

the non-academic facets of students' lives (Bao, 2020; Sun & Chen, 2016). The use of words such as "health", and "barriers" illustrates a new awareness of the socio-economical and psychological issues that affect the students and therefore, aligns with the literature on equitable education (Bozkurt et al., 2020).

### *5.3. Global and Domestic Education Comparison*

Comparing the selected global and domestic education themes shows the difference in the research interest areas. Whereas going and international students, internationalisation processes, and education policies occupy a central stage in global studies, domestic research addresses issues specific to a country, such as the gender gap and cultural impediments. This aligns with previous research on promoting contextualised solutions to online learning. Modular clusters named interconnected, for instance, 'migration' and 'university policy' show global and local connexions being addressed for an inclusive education paradigm.

### *5.4. Practical Implications*

The results have the following theoretical and practical implications for education stakeholders, policymakers, and institutions. In this way, the study can contribute to the design and development of efficient online education programmes to meet academic and non-academic learning needs. The results can be an avenue through which policymakers can formulate policies that can assimilate domestic and foreign educational settings while educators can try to fetch the above-mentioned themes to assist in changing student behaviour and performance.

### *5.5. Practical Recommendations*

- **Policy Development:** Based on the findings, the following policy recommendations have been derived: Policymakers should encourage programmes that can assist underprivileged students access affordable technology and the internet.
- **Program Design:** The Col framework should be adopted to influence the institutional pedagogical approaches to improve the online learning sphere.
- **Global-Local Integration:** The collaborating partners include universities from the domestic as well as international institutions with a view of sharing appropriate best practices from both the global and local forums where and when the system is striving to deal with both global and local challenges affecting online.

## **6. Conclusion**

The research conducted for this paper centred on the evolution of online learning and its implications for college student achievement through a bibliometric analysis of local and international literature. In particular, specific keywords, like academic self-efficacy, higher education, and barriers, emerged as extending evidence of shifting emphases toward equities, access, and learner outcomes. Scholars like Bandura and organisations including UNESCO were deemed to have a role to play as promoters for research to be conducted in this area. The outcomes also revealed clear differences in the subject areas between the international and local studies, where the international ones focused on the policies and processes of internationalisation, while local ones

dealt with more specific local issues, including socio-economic differentiation and cultural differences within societies. These insights confirm the research objectives to the extent of outlining the methodological and conceptual frameworks that have been used in online learning research. Building a link between the global outlook and the domestic context of education, the study raises the issue of universally applicable and student-centred approaches that can engage the global education- domestic-student population. It is hoped that these insights may be useful to policymakers, educators and researchers in addressing difficulties and improving equity and online learning.

### 6.1. Limitations of the Study

There are several limitations associated with the study. First, it depends only on Web of Science, which in turn may neglect articles from other databases such as Web of Science or Google Scholar. Second, considering articles published only within the years 2020-2024 might fail to explore previous fundamental studies in the field. The referring to bibliometric tools in the context of this study may not represent the quality of studies and articles and the richness of the qualitative data contained in the literature; hence, the necessity to conduct the mixed methods approach in future research.

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