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A global perspective of government initiatives to support higher education during the COVID-19 pandemic: A systematic review of literature

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ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic crisis has forced higher education institutions (HEIs) to develop preventative measures in compliance with national and international policies. In varying degrees, some of these measures cause disruptions in their way of offering educational services, whereas others enable them to continue offering their services to students. By surveying the relevant literature based on the Scopus database between 2020 and 2022 (inclusive), this study provides insight into governments' educational policies during the COVID-19 pandemic and their implications. For data analysis, the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) is utilized to explore government contingent policies related to higher education. R-studio is employed for thematic mapping based on keywords and abstracts from selected papers to integrate and present themes and current trends. Based on the analyzed results of 43 papers, it is concluded that during the COVID-19 pandemic, government policies were strongly associated with higher education digital transformation. Moreover, the government mainly plays a critical role in restructuring budgets, building infrastructures, and establishing social initiatives to support HEIs and students during the crisis. For the mentioned reasons, this study indicates the importance of governments' role and their policymaking strategies in terms of faculty development program initiations, funding and budget structure, administration, support for upgrading the existing information technology infrastructure, and establishment of new digital platforms to mitigate health risks while ensuring desirable learning outcomes through digital means during health crisis.

1. Introduction

Owing to the recent coronavirus disease 2019 (COVID-19) pandemic crisis, educational systems at international and national level were heavily affected and went through a difficult phase, particularly in light of the widespread school closures (Abbas et al., 2023; Orakci & Gelişli, 2021; Pitula & Grzyb, 2021). School closures are initiated to mitigate the impact of COVID-19 on students' health and contain the spread (Moscoviz & Evans, 2022). Significant shortcomings exist, such as inadequate educational facilities and the absence of crisis management tools in widespread health threats, such as COVID-19. Hence, many higher education institutions (HEIs) close their doors indefinitely or significantly suffer from financial losses (Abbas et al., 2021; Ejdyś, 2022). Additionally, the closure of schools caused learning loss in high-, middle-, and low-income countries, and the dropout rate soared significantly in

low- and middle-income countries. Donnelly and Patrinos (2021) reported that approximately 1.6 billion students in 190 countries were impacted directly by the closure of schools resulting from the multiple waves and ripples caused by the COVID-19 pandemic.

The internationalization of education compelled HEIs to formulate policies to respond to the pandemic in accordance with international and national-level policies to strengthen the educational systems while catering needs of international as well as domestic students (Ghani et al., 2022). According to (UNESCO, 2022), much of these efforts are put toward the following: addressing the necessary rapid reforms to solve accessibility problems caused by COVID-19 among financially burdened families; possible contingency actions that help HEIs to deal with the crisis on hand through budget reconstructions and extra funding; and mobility-related problems among international students, such as visa cancellations because of not being able to locate in the host country or

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not being able to return to their home country owing to COVID-19-related traveling restrictions (Cheng et al., 2020; Schutte et al., 2022).

Furthermore, international institutions, such as the United Nations (UN), indicate their concern about Sustainable Development Goals related to “quality education” (Hogan et al., 2022). According to Nketsia et al. (2022), quality education is a fundamental right of each child; it is considered a public good when all governments equally give priority and easy access to all citizens. Asadullah et al. (2021) identified that educational policies are considered a measurement tool to identify the emerging factors which unprecedentedly occur and impact education. National and domestic institutional policies must correlate with the international environment and standards. Initially, when COVID-19 started spreading, World Health Organization (WHO) officials issued advisories to all governments globally. Given the negligence of the majority of governments, COVID-19 spread in a very short period (Abbas et al., 2022b; Cingolani, 2022; Zabaniotou, 2020). One such example of government negligence was observed in Brazil. That is, two health ministers were forced to resign because of an increase in the number of COVID-19 patients and related deaths caused by inefficient policy-making to prevent the spread of the virus. Owing to the increasing death tolls and cases, many students prefer not to continue their education

during COVID-19, stating that they lack trust in the Brazilian government (Finardi & Guimaraes, 2020). Whereas lack of trust in the governments of European and Asian countries such as Germany, Denmark, and Bangladesh and HEI policies affect students’ mental health (Ballmann et al., 2022; Kabir, 2020). On the contrary, some Latin American countries create a safe environment for students to continue their education with low perceived health risks. Abbas et al. (2022a) explored that undergraduate students at a Mexican university trust their government policies related to the COVID-19 pandemic enough to enroll in their courses regardless of the teaching method. They illustrated that when governments comply with international policymaking standards and follow similar policymaking strategies to contextualize domestic affairs of HEIs, students’ perceptions of health risks are reduced, whereas their willingness to continue their education in various learning mediums is increased. However, HEIs’ internal policies must align with national and local policies to motivate students to attend their classes. For example, Tecnológico de Monterrey, a Mexican private HEIs, shifted its educational activities to an online format to support students’ well-being while offering them online education to prevent learning loss (Rodríguez-Galván et al., 2022; Sosa-Flores et al., 2022). Comparably, educational activities switch from face-to-face to online education to

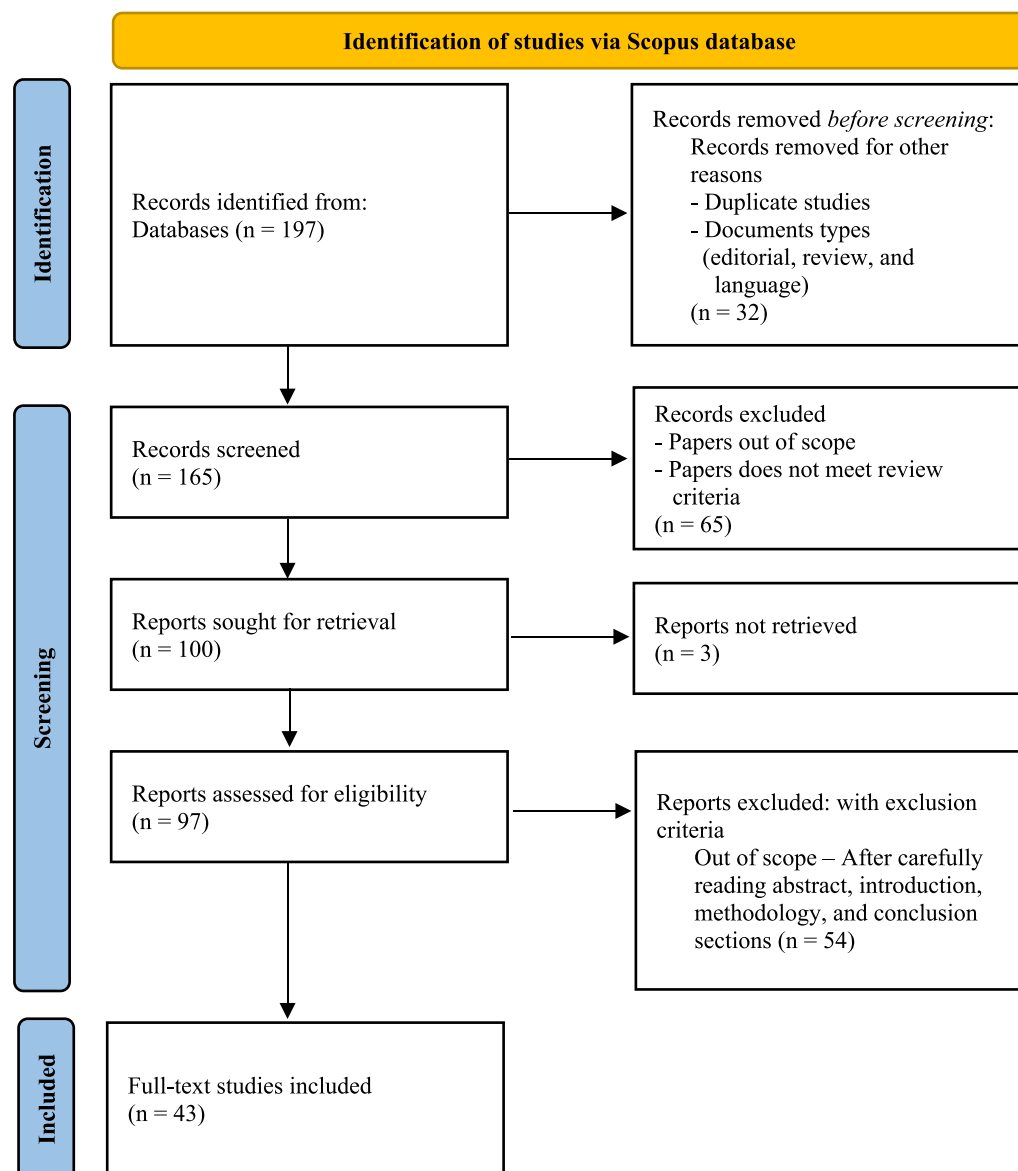


Fig. 1. Systematic review results based on PRISMA flow diagram (Source: own elaboration).

sustain students’ learning progress without interruption and ensure the students’ welfare (Courtney et al., 2022). However, notably, a significant number of low-income students could not attend online classes since they could not afford simple information technology (IT) equipment and services ranging from personal computers to high-speed internet (Asanov et al., 2021).

According to the WHO report (2022), for better understanding and preparedness for future pandemics, it is important to frequently develop new scenarios based on past experiences and shared knowledge. This aims to take the initiative and bring all stakeholders together. Furthermore, develop transformation mechanisms for better decision-making to handle emergencies and be well prepared for future pandemics (WHO, 2022). Consequently, in a case such as the preparedness of future pandemic, the present study contributes to the literature by highlighting the academic research trends of government strategies related to continuing educational activities at HEIs during the COVID-19 pandemic crisis. Subsequently, for a better understanding of the higher education policies of governments for the continuation of education, our research questions seek to establish the following:

RQ1: How were institutes of higher education prepared for the transition to digital education during the COVID-19 pandemic?

RQ2: How did government policies assist HEIs during the COVID-19 pandemic?

To answer the mentioned set of research questions, we designed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA)-based systematic literature reviews of extant studies to cover government contingent policies. The Scopus database is chosen to collect metadata, and the PRISMA approach is employed to analyze the data. Furthermore, R-studio is utilized to visualize and integrate the current trends and themes based on keywords and abstracts from selected papers.

2. Material and methods

The motivation and selection of a systematic literature review are to examine the chosen topic comprehensively through scientific approaches. The PRISMA approach provides a systematic evaluation process. It provides full transparency in keyword and database selection, exclusion and inclusion of papers, and review of the final selected data for data analysis with supplementary visual software (such as R-Studio) to present the data in tabular and graphical format.

The material and methods of this systematic review of literature are based on (1) PRISMA workflow, (2) database selection and search strategy, (3) inclusion and exclusion criteria, and (4) review strategy.

2.1. PRISMA workflow

For clarity regarding the conceptual construct related to government policies for higher education during the COVID-19 pandemic, we selected the PRISMA-based approach for the systematic review of extant studies. The method was helpful in comprehensively examining the chosen topic. According to Page et al. (2021), the PRISMA approach provides a checklist and standard procedure to fully ensure the objective of the literature review and get an answer to each developed research question. In addition, the PRISMA-based systematic literature review provides transparency in the process of database selection and search strategy. For a clear and transparent process, we followed the identification of studies using the Scopus database: (1) identification, (2) screening, and (3) inclusion developed for PRISMA (2022) scoping reviews.

2.2. Database selection and search strategy

The study relied on the PRISMA approach for the systematic literature review of extant studies. For data collection, we utilized the Scopus database. This database was selected because of its multi-disciplinary

Table 1
Inclusion and exclusion criteria.

Criteria	Description
Inclusion	- Selected paper published within two years (2020 – 2022). - Selected paper published in journal and conference proceedings - Topic is related to government policies – higher education during the COVID-19 pandemic
Exclusion	- Papers published after 2022. - Papers published in editorial, early access, letters, and notes. - Papers published in languages other than English.

nature. Moreover, the Scopus database is considered one of the largest databases in terms of records (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021; Alvarez-Sosa and Abbas, 2021), including indexed journals, books, and conference proceedings from all reputed publishers, such as ACM, Emerald, Elsevier, IEEE, Nature, Sage, Springer, Wiley, and others. According to Jacsó (2011), the Scopus database contains 44.5 million records of 27 subjects. From multi-disciplinary publication records, we obtained a valid and high number of samples within the literature for further analysis.

In any systematic literature review, firstly, researchers brainstorm and then formulate keywords. The purpose is to search and identify relevant published work from selected databases and generate research outcomes (Abbas et al., 2017; Corrin et al., 2022). For the search strategy and selection of keywords for this research, firstly, we brainstormed in accordance with the designed research topic and then searched keywords and synonyms based on the developed research question. The search strategy relied on a set of formulated keywords or a combination of keywords, that is, “COVID-19,” “government policy,” and “higher education,” and a time duration of three years (i.e., 2020–2022). Based on the selected keyword and set search strategy, the results initially found 197 papers in total. The PRISMA flow diagram was applied further in refining the data before the inclusion of studies for final analysis (Fig. 1).

In the first identification step, we found 197 articles and removed 32 before the screening step. After thoroughly screening the “title” and “abstract,” we excluded 65 out of 165 articles because of limited scope, such as papers that were out of scope and did not meet review criteria. During the next screening step, we excluded three articles due to the inability to retrieve the record. In the last step of screening, we had only 97 full-text articles. After a thorough review (Abstract, Introduction, Methodology, and Conclusion sections) of the articles, we included 43 full-text studies for this systematic review study.

2.3. Inclusion and exclusion criteria

Table 1 presents the inclusion and exclusion criteria of the papers. For the data search, we formulated keywords, and initially, we found 197 papers. The inclusion and exclusion criteria are in accordance with the PRISMA approach (Tricco et al., 2018). The first step is “identification” of the field, language, type, and status of publications before moving to the second step, that is, “screening” of (1) the abstract and title of papers and (2) eligibility (inclusion and exclusion criteria based on full-text access, time duration, type, and language). Finally, full-text papers selected were “included” for further analysis and discussion.

2.4. Review strategy

The review strategy is key in conducting any systematic literature review. In our study, we designed the review strategy to find a relevant and appropriate set of articles from the selected database, that is, the Scopus database.

For the successful execution of the review strategy, one author initially selected the database and then entered our keywords for

Table 2
Search queries.

Description	Search query
Query without filter	(TITLE-ABS-KEY (COVID-19) AND TITLE-ABS-KEY (government AND policy) AND TITLE-ABS-KEY (higher AND education)) AND PUBYEAR > 2019 AND PUBYEAR < 2022 AND PUBYEAR > 2019 AND PUBYEAR < 2022
Query with filter	(TITLE-ABS-KEY (COVID-19) AND TITLE-ABS-KEY (government AND policy) AND TITLE-ABS-KEY (higher AND education)) AND PUBYEAR > 2019 AND PUBYEAR < 2022 AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j") OR LIMIT-TO (SRCTYPE , "p")) AND (EXCLUDE (LANGUAGE , "French") OR EXCLUDE (LANGUAGE , "Portuguese") OR EXCLUDE (LANGUAGE , "Spanish")) AND (EXCLUDE (PUBSTAGE , "aip"))

specific years or periods. In this study, we collected data for three years (2020 and 2022). Initially, we found 197 papers. To narrow down the scope of research, we applied filters, such as language and document type (Table 2). For PRISMA analysis and its application, we downloaded the finalized dataset file in CSV format.

In the second stage of review, two authors independently reviewed articles that were included (43 articles) by carefully reading and writing the summary of the articles (Table 4 in the appendix) concerning the authors, type of articles (journals or conferences), methodology, and the country/region of origin. Finally, the principal author carefully reviewed the PRISMA flow diagram and the summary of articles, and then, the descriptive statistics were applied by using Microsoft Excel application to present the results in the form of bar charts and frequencies within the results section. To further analyze the results, we utilized R-Studio to visualize and integrate the current trends and themes based on the recent publication of [Aria and Cuccurullo \(2017\)](#). For this purpose, the raw data file collected as CSV at the beginning of the study was cleaned up in accordance with the PRISMA flow diagram steps. Following this step, based on the PRISMA findings, information from 43 papers is reformatted using the generic “convert2df” function to establish R (R version 4.2.2) appropriate bibliometric data frame. Then, by leveraging “results <- biblioAnalysis (biblioanalysis_data, sep = “,”), the main bibliometric syntax is created. Afterward, “Themap = thematicMap (biblioanalysis_data, field=“ID”, n = 43, minfreq = 4, stemming = FALSE, size = 0.7, n.labels = 5, repel = TRUE)” is utilized to create a conceptual thematic map of the field. Then, “plot (Themap\$map)” comment is employed to create the visual. Lastly, we applied thematic map clustering approach by using “bibliometrix” application to develop scales to produce trends based on frequency of keywords.

3. Results

The following subsection shows the findings based 43 papers that fit inclusion criteria using the PRISMA technique. Each section highlights the contextual background of the previously chosen to set of papers, such as descriptive statistics, publication types, country of origin analysis, and most commonly used methodologies in these papers. Then, the last subsection provides a thematic visualization to illustrate the evaluation of the field.

3.1. Descriptive statistics of chosen papers

Fig. 1 depicts the process of searching, that is, the PRISMA flow diagram. The first step was the selection of a database, followed by running a query (based on keywords). Through this process, a total of 197 papers were collected. 139 (70.6%) of these papers were published as open-source access, and the remaining 58 (29.4%) were published through the traditional publication route. Furthermore, of the 161 of 197 were published as journal articles, 15 book chapters, 10 conference papers, 7 reviews, 2 book, 1 editorial, and 1 conference review papers. To narrow the scope based on the research question and the PRISMA, the authors considered only journal articles and conference papers, that is, 43 papers.

3.2. Country of origin investigation for chosen papers

Most of the studies conducted on the government’s national policies of higher education were conducted in Indonesia 4 (9.3%) and China, that is, 4 (9.3%). We also observed six comparative studies that were conducted based on regional policies: (1) global (133 countries, 6 continents), (2) international consortium of 26 countries across Europe, (3) global, (4) Arab (Bahrain, Kuwait, Yemen, Palestine, Egypt, Somalia), (5) and two studies were comparative between the (a) US and Pakistan and (b) Germany and Denmark (Fig. 2.).

3.3. Most commonly used research methodologies among chosen papers

The results indicate that most studies were conducted based on empirical and quantitative research methods, that is, 18 (41.8%) out of 43. The objectives of these studies were to observe the broader response from participants and identify government policies related to higher education during the COVID-19 pandemic crisis. The findings also highlight that short communications and case studies were the least adopted research methodologies among papers published in the journals (Fig. 3.).

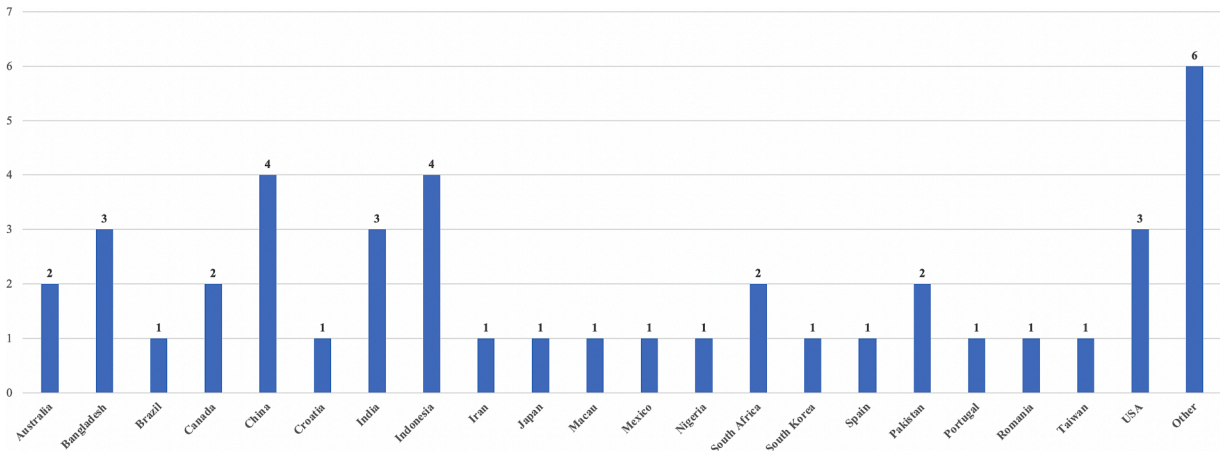


Fig. 2. Papers included in the study by a list of countries.

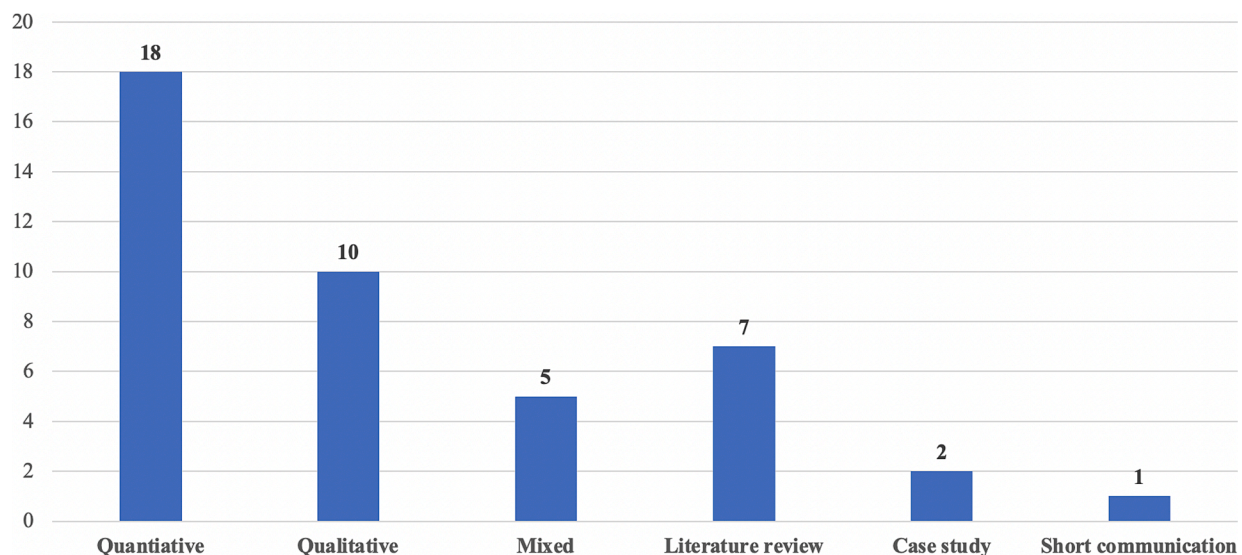


Fig. 3. Papers included in the study by methodology.

Table 3

Cluster wise representation of list of authors and indexed keywords and frequency of keywords.

Cluster	Author and indexed keywords (Scopus database)	
	List of keywords	Frequency
Covid-19	COVID-19 pandemic	12
	Gender (Male and Female)	14
	Health care policy	2
	Prediction	2
	Learning systems	2
	University	2
Higher Education	Higher education	2
Students	E-learning	3
	Educational institutions	2
	Teaching	3
	Students	6

3.4. Visualization of themes based on chosen papers

R-studio-based visualization of themes enables scholars to integrate the literature better and show the current paradigm shift in the relevant body of work. It relies on two-dimensional representation, namely the *development degree* on the x-axis (the amount of publication and publication density) and the *relevance degree* on the y-axis, which highlights the four quartiles: “Motor Themes,” “Niche Themes,” “Basic Themes,” and “Emerging or Declining Themes.”

In the Motor themes (quadrant), “humans,” “pandemic,” “health care policy,” and “coronavirus disease 2019” have high centrality and density, which represent the importance and developed research topic. In another quadrant, “Niche theme,” “practice guideline,” and “training” have internal links between both issues and have high centrality but low density. In the Emerging or Declining themes (quadrant), “teaching” and “health care planning,” is decline whereas “learning students” emerging topic of research and association with the topic of “COVID-19” under “Basic themes” (quadrant) and has high centrality and low density.

As shown in Table 3, cluster-wise presentation of the list and frequency of authors and journal-indexed keywords against each paper in the database. Furthermore, cluster-wise representation of authors and indexed keywords for the government initiatives to support digital transformation and higher education policies. Firstly, cluster-wise

analyzed results confirm that the 34 articles out of 43 focused on Covid-19 (34 articles) cluster have a higher frequency of occurrence with the keywords of COVID-19 pandemic (12 articles), gender (female (7 articles) and male (7 articles)), university (2 articles) and prediction (2). Meanwhile, the “students” cluster is based on 14 articles, and the cluster shows the keywords of students (6 articles), e-learning (3 articles), learning systems (3 articles), and educational institutions (2). Whereas “higher education” is a minor frequency occurrence in the third cluster with only the keyword of higher education (2 articles).

4. Discussion

The objective of this systematic literature review-based study is to explore the higher education support policies of governments for the continuation of academic activities in public and private universities. In the later part of this section, we thoroughly discuss our established research questions based on analyzed PRISMA results, that is, (1) *How were institutes of higher education prepared for the transition to digital education during the COVID-19 pandemic?* (2) *How did government policies assist HEIs during the COVID-19 pandemic?*

The following sub-categories further explore in detail the collection of 43 papers that are included in the study. They further delve into the themes that are highlighted in Figure 5 and provide the current state of the studies while discussing potential implications and applications of the results of the studies.

4.1. HEIs preparedness to transition to a digital education during the COVID-19 pandemic

During the first and second waves of the pandemic, some of the HEIs in countries that went into lockdown were severely affected owing to disruptions in class schedules and interrupted academic events. Although some HEIs relatively navigate these struggles easily, others suffer from internal and external pressures because of the financial and human resources burdens. In the case of developing Asian countries, the struggle was attributed to the lack of infrastructural advancements, which are prerequisites for shifting from face-to-face to online education, and the scarcity of financial institutions which can offer large sums of credit lines to the HEIs during the crisis (Hayashi et al., 2022; Mališ et al., 2022; Ramlo, 2021; Wang & Sun, 2022). Owing to the absence of crisis planning and proper agenda-setting for digital transformation, the perceived COVID-19 burden further increased among HEIs and students in developing Asian countries (Lawrence & Wu, 2020).

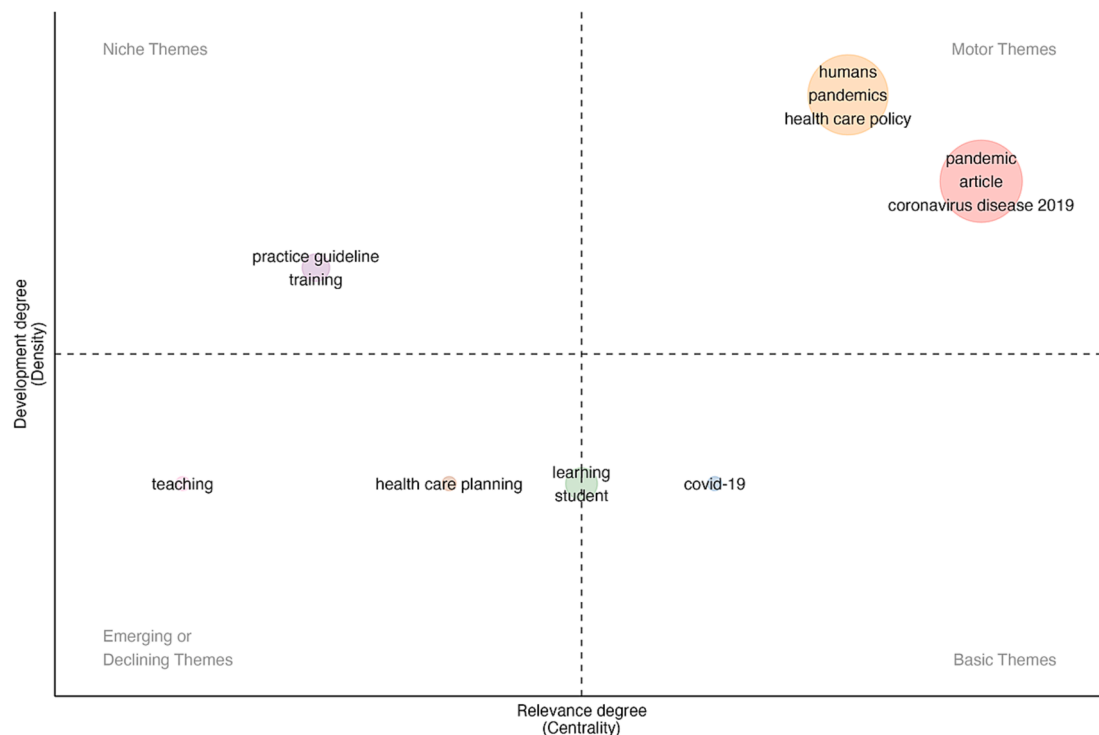


Fig. 4. Thematic map representation of keywords in publications selected at the end of the PRISMA analysis.

On the contrary, developed countries have managed the transformation processes relatively well in terms of infrastructure and transformation preparedness. However, they struggle with public opinion on educational policies and preventative measures. The most striking case in this regard is the U.S.A. During the COVID-19 pandemic, many young adults and student bodies organized protests that aimed at vaccination mandates, mask obligations, and fever checkpoints established by local governments, federal entities, and school boards (Haeder, 2021). Similar tendencies are reported in developed countries globally (Aristovnik et al., 2020). However, Suart et al. (2021) reported that some doctoral students find that the preventative measures taken are necessary and contribute to the overall well-being of society. This political and philosophical divide between various social factions in various countries led to contextualizing the COVID-19 response based on country-specific emergencies. Thus, the establishment and introduction of a generic or blanket policy framework in response to the COVID-19-related education policymaking efforts have so far not been fruitful. This case can also be observed through the thematic analysis (Fig. 4) illustration, which indicates the lack of overlapping constructs among “teaching,” “health care planning,” and “training.”

Beyond the income-related struggles, the digital divide has become a struggle owing to the lack of online teaching and learning experience among faculty (El Masri & Sabzalieva, 2020; Ramlo, 2021). The urgent transition to modular online learning during the COVID-19 pandemic requires students and teachers to be proficient in online learning systems (Diep et al., 2022). Lecturers and students were expected to be able to execute their daily tasks, communicate efficiently with their peers, and establish a digital learning environment that is an enabling teaching environment (Chen et al., 2022; Oliveira et al., 2021). Wrahatnolo et al. (2021) argued that during the COVID-19 crisis, digital literacy became an essential factor in the metacognitive development of students in an online learning environment. However, most students and lecturers were not digitally literate or competent enough to fulfill the mentioned requirements at a high standard, particularly in developing countries (Branquinho et al., 2022; Martha et al., 2021). For instance, in the case of Bangladesh, public universities faced difficulties in shifting from face-

to-face to online learning, considering that the required human capital and financial means were lacking to support teachers' training (Ahmed, 2022; Kabir, 2020). Similarly, the low levels of digital literacy coupled with the low income in Latin American countries have greatly hindered the transition of HEIs from in-class to online teaching. This case might enable students to continue their education with lesser negative impacts (Okoye et al., 2022). Therefore, these countries are stripped from the benefit of the urgent change to prevent potential learning gaps and prolonged learning loss.

Hence, the findings highlight that, in response to “RQ1: How were institutes of higher education prepared for the transition to digital education during the COVID-19 pandemic?”, HEIs located in advanced countries were more prepared than their counterparts in the developing nations. In addition, HEIs in developing countries greatly suffered from poor ICT infrastructures, budgetary restrictions, and the absence of professors' preparedness to switch to new teaching environments. In the case of the advanced country HEIs, HEIs were relatively ready to switch from one mode of teaching to another and relatively less prone to the adverse effect of the financial crisis caused by the COVID-19 pandemic.

4.2. Government policies assist HEIs during the COVID-19 pandemic

Governments globally have followed the WHO recommendations to protect people's lives and to halt the spread of the virus across society by enacting partial or complete lockdown measures at the national and local levels, suspending all activities—including schooling. Before resuming educational operations during the COVID-19 pandemic, governments and their pertinent ministries contemplate various solutions and set of potential actions to ensure a quick and efficient return to the socio-economic life as we know it (Hou et al., 2022; Ko et al., 2021; Yeste et al., 2022). One of the most critical steps in this regard was transforming education and integrating online learning modalities. In the case of South Africa, for instance, HEIs designed their policies in accordance with national policies of digital transformation (Kativhu, 2021; Xie, 2022). In Rwanda, South Africa, and Tunisia, with the support of their relative state institutions, HEIs form collaborations with

Internet providers, such as CELL-C and MTN, to offer Internet access to students at a reduced or no cost. Owing to these agreements, they can keep providing education to their students remotely while obeying the lockdown measures imposed by the government (Kativhu, 2021). Similarly, in the case of LATAM, HEIs received funding from municipalities and their federal governments to impose lockdowns and reduce the offered programs during the COVID-19 pandemic (Okoye et al., 2022). Social programs are established to support students' needs, and professional training sessions are offered free of charge in various HEIs through government-funded programs to enable them to build relevant skills. In the case of Indonesia, multiple socio-economical programs are introduced, and financial support is offered to the students. For instance, the provincial government of Lampung funded programs that offer zero-interest school funding for students during the pandemic (in some cases, donations), additional education budget for the struggling state-owned universities, and free-of-charge health care services to students (Karomani & Iwan Satriawan, 2021). Owing to the collaboration between governments and HEIs, students can continue their education while following governments' policies.

The shift in education must address not only digital transformation needs but also a collaboration between HEIs to fit and work well with various government initiatives and global educational value chains (du Plessis et al., 2022; Ivenicki, 2021). Some of the severe implications of neglecting this reality surfaced during the first two waves of the COVID-19 pandemic. For instance, Australian government policies prioritize domestic interests over global cooperation and democratic principles, which causes emotional stress and fear because of the lack of support (Hermanto & Putri, 2021). Similarly, in the case of the Macau government, the strict lockdown policy related to travel restrictions has its bearing and direct effects on students' emotions (Agyeiwaah et al., 2021). As a result of these types of failures and policies negligence towards the nature of the expectations of students in a global setting (Aristovnik et al., 2020), the public lost its confidence in the governments' policy making efforts (Ballmann et al., 2022; Satriawan, 2021; Yu et al., 2021). Thus, the literature review revealed that governments and HEIs must devise policy frameworks that agree with international and domestic institutions and their policies (Abusamra et al., 2022; George & Tarr, 2021). In addition, governments must take action to develop and implement policies that will help HEIs students feel protected and accounted for in times of global-scale emergencies (Abbas et al., 2022a; Bochiş et al., 2022; Shafiq et al., 2021).

The literature review also highlights that there is a lack of a unified higher education crisis management strategy with an emphasis on the relationship among "healthcare planning," "training," and "teaching" constructs and government policy building (Ajagbe et al., 2021; Asher, 2021; Ivenicki, 2021). Therefore, it is critical, essential, and timely to focus on developing a framework that addresses government and HEIs collaboration to prevent adverse effects of future pandemics, emergencies, and unprecedented shocks to the education system at the local and international levels to ensure continuity and quality of education.

In response to "**RQ2: How did government policies assist HEIs during the COVID-19 pandemic?**", although advanced and developing countries' governments tried to implement a great deal of support structures and policies, developing countries' efforts fell short. This case is attributed to inefficient budget structuring, failing to address students' emotional well-being, and establishing frameworks that confirm and enable HEIs to integrate themselves into international settings. On the contrary, advanced countries' governments turned out to be more resilient and ready to respond to the COVID-19 pandemic. However, the chosen 43 papers also indicated that although the advanced countries have outperformed the developing nations, they still failed to respond to the pandemic at the expected level (Asher, 2021; Haeder, 2021) such as due to budget restrictions, prioritize democratic values over promoting international education, domestic interests over global cooperation, political pressure affects HEIs', missing link between academic mobility, teaching and research activities in higher education, and unclear

government policies.

5. Theoretical and practical perspectives, and policy recommendations

5.1. Theoretical and practical perspectives

The implication of this study covers theoretical and practical perspectives. First, the theoretical contribution of this study to highlight a global context where governments establish and implement national and international policies is in the interest of their nation. The second contribution is identifying and highlighting the number of challenges faced by HEIs during the pandemic, particularly from developing countries in the form of digital transformation. The practical application of this study offers insight into the struggles that developing and developed countries face. This case might provide important pinpoints for international organizations, such as the WHO and the UN, on how to assist HEIs in case of a future pandemic. Furthermore, the study highlights that to achieve the UN vision 2030 of SDGs for "quality education," governments around the globe should implement policies that prioritize advancing their ICT infrastructure and programs that enable the faculty to develop the skillsets needed for modern education systems. Moreover, the study provides insight into why and how HEIs should focus on international education systems, promote digital literacy to close the digital divide, upgrade IT infrastructure, and implement internal policies that promote an equitable learning environment for students to be prepared for future challenges.

5.2. Policy recommendations

The analyzed results of this study were based on systematic review, which provide thorough recommendations to the policymakers of both the government and HEIs. Firstly, the government of both developed and developing countries must prepare coherent, supportive policies to deal with future challenges similar to the pandemic. Secondly, international funding agencies allocate more funding to help developing countries improve quality education by enhancing HEIs infrastructure. Furthermore, strategies must be applied to enhance teachers' skills and implement new digital platforms to continue educational activities to reduce students' learning loss. Lastly, HEIs must design and implement new educational policies in line with national and regional government guidelines to transform their educational system into a digital one where students of all grades can learn new 21st-century skills and be well prepared to compete with upcoming challenges.

6. Conclusion, limitations, and suggestions for future work

6.1. Conclusion

This systematic literature study discusses a global perspective on government initiatives to support higher education during the COVID-19 pandemic. We conclude the finding of this systematic literature review based on our research question that is:

- During the COVID-19 pandemic, higher education institutions (HEIs) of developed nations were more prepared to transform to digital education than developing nations regarding the latest ICT infrastructure, a better economic situation, and skilled faculty.
 - o The digital divide, caused by a lack of infrastructure and clear plans for the transition to online education owing to financial restrictions, has become more prominent in these communities. Students lost trust in their governments and stopped pursuing their degrees.
 - o Government policies of developing nations, securing extra funding for HEIs, and supporting digital transformation were the critical

Table 4
Summary of included studies.

Authors	Summary	Type	Method	Region (Country)
Abbas et al. (2022a)	Government policies help students of HEIs to reduce COVID-19 risk along with promoting life satisfaction. So, the government's right decisions/initiatives at the right time can increase trust-building efforts.	Journal	Quantitative	North America (Mexico)
Abusamra et al. (2022)	During the COVID-19 pandemic, Arab HEIs rethought and developed new public policies to ensure social responsibilities to encounter post-pandemic challenges related to economic difficulties and continuation of education and training at all levels.	Journal	Literature review	Arab (Bahrain, Kuwait, Yemen, Palestine, Egypt, Somalia)
Agyeiwaah et al. (2021)	Owing to the concentration on domestic travel under the government's efficient hospitality and tourism health policies, the stringent application of COVID-19 laws by the government has an emotional impact on people (students and higher education employees) but has little influence on the tourist business.	Journal	Quantitative	Asia (Macau)
Ahmed (2022)	Research highlights that high-rank universities with better infrastructure, skilled human resources (faculty), and students struggle during the pandemic crisis, and neoliberalism must address and require possible reforms to reduce existing social issues.	Journal	Qualitative	Asia (Bangladesh)
Ajagbe et al. (2021)	Online testing is appropriate for assessment in higher education, but the biggest barriers are students' negative experiences with the university's infrastructure and unfriendly rules.	Conference	Quantitative	Africa (Nigeria)
Aristovnik et al. (2020)	Globally, the COVID-19 pandemic had an influence on students in higher education. Although university faculty members and administrative staff support these students, the new educational norms have an impact on them because of their lack of digital literacy and workload. Student expectations are not met by the government policy.	Journal	Quantitative	Global [133 countries, 6 continents]
Asher (2021)	Comparing Pakistan to the USA, the digital divide has a stronger impact on the educational system. Governments in developing nations updated their educational policy to close the digital divide by integrating technology into classrooms in fair and accessible ways.	Journal	Qualitative	North America and Asia (USA and Pakistan)
Ballmann et al. (2022)	During COVID-19, a lack of trust in government and HEI policies affects students' mental health.	Journal	Quantitative	Europe (Germany and Denmark)
Bochiş et al. (2022)	Government national policies must consider perceived students' well-being due to the unprecedented pandemic and online education transformation.	Journal	Quantitative	Europe (Romania)
Branquinho et al. (2022)	The pandemic affects university students' physical and mental health due to a lack of social interaction. So, HEI policies continue to support their students in-term of well-being, technology, and financial support.	Journal	Quantitative	Europe (Portugal)
Chen et al. (2022)	Government well-being policies play a central role in supporting students in the continuation of their education and also accepting new technologies in a significantly shorter time.	Journal	Literature review	Asia (China)
Diep et al. (2022)	During the pandemic, rapid transformation in the mode of the education system (in-person to online) affects teachers' learning educational knowledge and pedagogical skills.	Journal	Quantitative	Asia (Iran)
du Plessis et al. (2022)	In HEI, collaboration and team efforts drive an essential element to handle crises through leadership and self-leadership.	Journal	Literature review	Africa (South Africa)
El Masri and Sabzalieva (2020)	Although receiving assistance from the government throughout the epidemic, academic mobility, teaching and learning, and research activities in higher education were missing a link.	Journal	Literature review	North America (Canada)
George and Tarr (2021)	The government's performance in terms of corporate investment in innovation under the engagement strategy and framework is primarily measured by the level of research collaboration between universities and industry.	Journal	Mixed	Australia
Haeder (2021)	The necessity of the COVID-19 vaccine in educational settings gives the government the chance to create and execute new policies for the continuation of educational activities.	Journal	Quantitative	North America (USA)
Hayashi et al. (2022)	Unclear government national policies impact the decision-making process of HEIs and their competent authorities—meanwhile, cultural values and learner-centered approaches are helpful in strategic planning against the pandemic.	Journal	Qualitative	Asia (Japan)
Hermanto and Putri (2021)	Students at universities are motivated to accept online learning despite obstacles including Internet quotas, a heavy course load, and poor time management.	Conference	Quantitative	Asia (Indonesia)
Hou et al. (2022)	During COVID-19, Taiwan's government took possible measures for HEI's safety and ensured quality education through a crisis management approach.	Journal	Mixed	Asia (Taiwan)
Ivenicki (2021)	To overcome obstacles in a multicultural environment, public sector universities are utilizing digital learning for lifelong learning in conjunction with educational practices that are in accordance with governmental policies.	Journal	Case study	South America (Brazil)
Johnson et al. (2021)	Administrative choices regarding the mode of instruction and the political climate are made to favor political activity in US universities open during the COVID-19 pandemic. Then, political pressures affect HEIs' willingness to accept social change.	Journal	Quantitative	North America (USA)
Joshi et al. (2020)	This study evaluates teachers' difficulties in preparing for and implementing COVID-19 policies regarding online teaching and assessments conducted while working from home. The study also recommends that the HEIs' authorities prepare for and integrate online teaching into current educational settings.	Journal	Qualitative	Asia (India)
Kabir (2020)	Following the shutdown, all academic activities in Bangladesh moved online. Private institutions continue to offer online education, whereas public universities are continuously making changes to become more digitally oriented. Government attention is drawn to the need to establish a platform for public sector HEIs at all levels of education when it is determined that these institutions are not ready.	Journal	Quantitative	Asia (Bangladesh)
Kativhu (2021)	Digital transformation in rural universities can be accomplished by following national policy and working with other higher education institutions.	Journal	Literature review	Africa (South Africa)

(continued on next page)

Table 4 (continued)

Authors	Summary	Type	Method	Region (Country)
Ko et al. (2021)	In situations where the government is obligated to take action in the interest of the public, quick responses from colleges and universities assure the continuance of higher education.	Journal	Literature review	Asia (South Korea)
Lawrence and Wu (2020)	Higher education policies that are implemented in real time help the government deal with crisis management situations and offer special information on the impact of policies during crises, including opportunities to assist students.	Journal	Mixed	Asia (China)
Majeed et al. (2020)	Medical faculty (dental) is unable to offer online courses during the COVID-19 pandemic. To prevent health concerns and keep up with educational activities, this institute and organization published guidelines.	Journal	Short communication	Asia (Pakistan)
Mališ et al. (2022)	HEI policies and government funding during COVID-19 help promote digital education.	Journal	Case study	Europe (Croatia)
Martha et al. (2021)	As an e-learning culture spreads throughout higher education institutions, e-learning preparation has become the new standard. This culture has an impact on the students' gender, region, and academic year. To support learning resources, metacognitive scaffolding support, motivational scaffolding assistance, and online learning preparation, multiple institutional policies are needed.	Journal	Quantitative	Asia (Indonesia)
Narang et al. (2021)	Online classes are popular with university students owing to their flexibility, good test scores, and enhancement of digital literacy. However, there are some drawbacks, such as a lack of online teaching expertise and a rapid changeover period.	Journal	Qualitative	Asia (India)
Patra et al. (2021)	The adoption of the e-learning system was difficult for university professors. Reforms were needed to address ICT literacy and abilities among university teachers as a result of government policies relating to e-learning in HEI.	Journal	Quantitative	Asia (India)
Qi and Ma (2021)	Chinese students studying abroad suffer from the pandemic's consequences on health and education. The country's interests were the government's top priority. Australian governments should prioritize democratic values over financial benefits when promoting international education.	Journal	Qualitative	Australia
Ramlo (2021)	Universities in remote areas are being forced to close because of budgetary restrictions brought on by the rapid change in the educational delivery system.	Journal	Mixed	North America (USA)
Satriawan (2021)	Government and university cooperation promotes engagement, mutual assistance, and synergy, with the government serving as a facilitator and the university providing support for community implementation.	Journal	Qualitative	Asia (Indonesia)
Shafiq et al. (2021)	Given the financial crisis and the suspension of all academic activities, the COVID-19 pandemic had a negative impact on students' mental health, particularly students attending public universities. Students attending private universities also experience negative effects because of the high cost and uncertainty of online learning opportunities. They can lessen stress with the aid of timely educational policy design and execution.	Journal	Qualitative	Asia (Bangladesh)
Shuja et al. (2021)	Machine learning cluster techniques contribute to the design of educational policies to reduce health risks by maintaining social distance among students through an edge network.	Conference	Quantitative	Asia (Pakistan)
Suart et al. (2021)	Laboratory-based research that is interrupted by working from home has an adverse effect on mental health, even when a supervisor provides support for the continuation of the task under institutional policies.	Journal	Mixed	North America (Canada)
Van de Velde et al. (2021)	The cross-sectional study provides a guideline for cross-HEI and cross-country policies of European nations to better prepare for future crises and the well-being of students.	Journal	Quantitative	International consortium of 26 countries across Europe/Europe
Wang and Sun (2022)	Literature-based evidence confirms the number of challenges faced by HEIs in-term of incoordination, inadequate infrastructure, and lack of online teaching and learning skills of teachers and students.	Journal	Literature review	Global context
Wrahatnolo et al. (2021)	The SEM-based prediction model is based on students' digital self-efficacy, digital literacy, and associated metacognition in online learning environments.	Conference	Quantitative	Asia (Indonesia)
Xie (2022)	During the COVID-19 pandemic, prior macro-lecture experiences and skills help teachers teach and improve social and personal relations.	Journal	Quantitative	Asia (China)
Yeste et al. (2022)	University-competent authorities make better decisions based on the current situation and collect evidence under government guidelines.	Journal	Qualitative	Europe (Spain)
Yu et al. (2021)	The balance between graduate employment and policy practice affected by the pandemic is a topic of public debate.	Journal	Qualitative	Asia (China)

success factors for enabling HEIs to deliver high-quality education while protecting the students' well-being.

- o Additionally, HEIs are unable to develop programs to assist their professors in developing their online learning skills and shifting their curriculum from face-to-face to online teaching.
- Governments of developed and developing nations designed and implemented supportive contingent policies to enhance HEI infrastructure for continuing education at all levels through financial support for digital transformation (e-learning) and the skills development of teachers and students.
- o The governments of developing countries should prioritize policies that address issues related to providing faculty development programs, enhancing IT infrastructure, and implementing new digital platforms to address health risks and student learning loss as preventative measures against future large-scale health crises.

6.2. Limitations, and suggestions for future work

Like all research, this study has drawbacks. A major weakness of the study is that it only looks at government-higher education initiatives during the COVID-19 pandemic. The second limitation that can be considered is the language. Considering LATAM nations predominantly speak Spanish, including papers written in Spanish might provide a better insight into the subject. However, these shortcomings can be seen as opportunities for future directions for scholarly works. The analysis of post-COVID-19 government policies relating to HEIs regarding learning loss and dropouts could be a valuable avenue to explore. Additionally, scholars may want to focus on interdisciplinary works that address the spillover effects of international politics, institutional frameworks, and higher education networks. This will enrich the understanding of policymakers, HEIs, and scholars on the interplay among previously

mentioned constructs.

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Asad Abbas: Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Anil Yasin Ar:** Writing – review & editing, Validation, Visualization, Conceptualization. **Samira Hosseini:** Writing – review & editing, Validation, Supervision, Conceptualization.

Declaration of Competing Interest

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Appendix

See Table 4.

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