Received: 27-11-2025
Revised: 08-12-2025
Accepted: 15-12-2025
Published: 27-12-2025

Elicit Journal of Education Studies
ISSN: 3093-0472

https://elicitpublisher.com

EMPIRICAL PAPER

Redesigning Learning Spaces in Higher Institutions for the Post-Pandemic Era: A Systematic Review

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Abstract

Purpose: This systematic review examined how higher education institutions redesigned learning spaces in response to the COVID-19 pandemic, focusing on student engagement, institutional challenges, flexibility, and the role of redesigned spaces in fostering community and collaboration.

Methodology: Using PRISMA guidelines, the study systematically searched Scopus and Google Scholar for peer-reviewed articles published between 2020 and 2025. Forty one met the inclusion criteria. A descriptive analysis and cluster-based keyword mapping were used to identify thematic patterns related to learning space redesign.

Result: Findings show that redesigned learning spaces particularly online, hybrid, flexible, and technology-enhanced formats significantly shaped engagement and participation by improving interaction, accessibility, and communication. Institutions, however, faced substantial challenges including digital inequities, limited infrastructure, insufficient faculty training, and uneven student readiness for technologically mediated learning. Flexibility emerged as a core strategy for coping with uncertainty, enabling continuity through blended, asynchronous, and multimodal learning designs. Redesigned spaces also played a central role in rebuilding community and supporting collaboration through digital platforms, hybrid classrooms, and inclusive technologies.

Novelty and contribution: The study provides a comprehensive synthesis that integrates design principles, pedagogical strategies, and technological affordances shaping post-pandemic learning spaces. It contributes a global perspective on how learning spaces physical and virtual can be redesigned to support engagement, equity, and collaborative learning.

Practical and social implications: The review offers actionable insights for policymakers, administrators, and educators seeking to develop adaptive, inclusive, student-centered environments that remain resilient in future disruptions.

Keywords: Learning space, Higher institutions, Covid-19, Systematic review, PRISMA, Learning experiences, post-pandemic

1 Introduction

The Coronavirus Disease 2019 (COVID-19) epidemic has caused impending change in our society, affecting the way we think, act, and communicate. Within the realm of higher education, numerous establishments have had to adjust

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How to cite this article:

Lebona, R., Mphunyane, M.Z., Mochekele, M. & Thamae, L. (2025). Redesigning Learning Spaces in Higher Institutions for The Post-Pandemic Era: A Systematic Review. *Elicit Journal of Education Studies, 1* (1), 44-59.

to the advent of online learning, which has involved navigating intricate technological systems, creative methods of instruction, learning, and evaluation, and adjusting to the reality of work-from-home settings, which have become a prominent aspect of many people's lives (Saladino et al., 2020; Hosseinzadeh et al., 2022; Alizadeh et al., 2023). The Covid-19 pandemic began in 2020 and resulted in the closure of most schools worldwide, the discontinuation of traditional learning, examination cancellations, academic seminars, workshops, and disruptions to distance learning (Al Ansi & Al Ansi, 2021). This effect has prompted several inquiries concerning the difficulties, possibilities, and fixes for this kind of issue.

Education sector was one of the top industries affected, out of a wide range of industries. The effects of COVID-19 on schools, instructors, students, and pedagogy provide issues for the educational system. Within a few months of COVID-19's birth, 83% of schools worldwide had closed by late April, severely impairing the educational experience for almost 1.4 billion kids and their families (United Nations Educational, Scientific and Cultural Organisation, Education: From disruption to recovery, 2020). Stress symptoms, less time spent studying, lack of interaction with peers, difficulty adjusting to a new learning environment that is constrained and unable to provide the necessary resources, and, for some, even lack of internet access, are just a few of the problems that students face and which negatively impact the quality of their education (Organisation for Economic Co-operation and Development, 2020).

Teachers on the other side, not only were affected by the pandemic in ways like job loss, or a cut off in salaries, and a huge increase in the number of working hours. That, in addition to other personal struggles of their own. They also take part of the responsibility of compromising the learning quality for students due to lack of training of online learning methods, lack of experience of how to interact with students virtually and the other obstacles that come with online learning. (Espino-Díaz et al., 2020).

These days, workplaces are viewed as learning environments where people come to learn from their colleagues, particularly in the aftermath of COVID-19. In the meantime, academic labor has always allowed for the flexibility to work from home (or anyplace/anytime); but, this hasn't always applied to campus workspaces ("don't touch my room"). (Ninnemann et al, 2020; Wheele et al., 2023). Brick and mortar learning spaces have been replaced by online learning settings with ICT and internet access (Weller, 2007; Al-Ansi et al., 2019). A socially interactive learning environment has replaced the previous one in its entirety (Wheele et al., 2023). By examining these areas more rigorously, it is also possible to understand the consequences of higher education, which is becoming more and more digitally focused, on the whole learning and academic employment experience (Lahti et al. 2021).

In higher education, existential problems have surfaced both during and after the COVID-19 crisis (Jacques et al., 2023; Singh et al., 2021). Eringfeld (2021) examines the utopian and dystopian imaginaries that have emerged in response to the COVID-19 crisis in higher education. Through a podcast series and research interviews at Cambridge University, the study reveals significant concerns among students and academics regarding the shift to online learning. The loss of embodied and communal educational experiences is a common fear, emphasizing the importance of maintaining face-to-face interactions and a sense of community in higher education.

With an emphasis on teaching, learning, and research outcomes, researchers are examining the layout and use of spaces in higher education. The literature outlines a number of criteria for assessing spaces in higher education, such as technology's effect on space use, specialty space requirements, campus architecture, and community support from the university. Different learning settings can have a significant impact on students' learning results, according to empirical data (Temple & Fillippakou, 2007; Park & Choi, 2014).

The COVID-19 pandemic has led to a global outbreak, resulting in the implementation of quarantine measures in many parts of the world. This has caused thriving cities to become ghost towns and educational establishments like colleges and universities were feeling the repercussions of this (Dhawan, 2020). The education sector quickly moved from traditional offline teaching methods to online modes of pedagogy as a result of physical campuses closing. The requirement to adjust to new health and safety regulations, remote learning techniques, and the changing nature of education created the need to rethink learning environments (World Bank, 2021; Zhao & Xue, 2023). With the use of online learning platforms, academic institutions could reach a wider audience and lecture to a lot of students anywhere in the world at any time (Aslam 2021). Many universities completely digitalized their operations in reaction to the pandemic, realizing the value of online education given the circumstances. However, significant obstacles had arisen as a result of the change to online learning, including scale, distance, and individualized instruction (Tosto et al., 2023; Masalimova et al., 2022).

Nonetheless, institutions could address these issues in creative ways (Farnel et al., 2021). At this point, improving the quality of online teaching and learning is essential since academic institutions need to drastically adjust to the changes (Korkmaz & Toraman, 2020). Opposition to change won't benefit any educational program worldwide. Rather, their standing will be assessed based on how quickly they can adjust to the changes and how well they can preserve the quality (Carey, 2020).

Higher education institutions have seen a sudden and significant change toward online and remote learning due to the COVID-19 epidemic. This has created issues with regard to scale, distance, and individualized instruction. The necessity to reconsider campus learning spaces and their function in the post-pandemic environment has been highlighted by this sudden digitization (Leijon et al., 2022; Papaioannou et al., 2023). Higher education's traditional learning environments are frequently created using passive learning concepts and fixed row-by-column seating configurations that are incompatible with technology-enabled, active, and collaborative learning (Casanova, 2014). More people are beginning to view these rigid formal venues as unsuitable for encouraging the innovation, creativity, and personalization that contemporary pedagogies and student demands require (Leijon et al., 2022; Casanova, 2014). Hence, the primary aim of this systematic review is to explore and synthesize existing research on how learning spaces in higher education can be redesigned to enhance the student experience in the post-COVID-19 era. This involves examining various design principles, technologies, and pedagogical approaches that can be integrated into physical and virtual learning environments. By doing so this systematic literature review plans to answer the following research questions.

i. How do the changes in learning space design impact student engagement and participation in the post-COVID-19 era?
ii. What role does flexibility in learning space design play in adapting to uncertainties and changes in the post-pandemic education landscape?
iii. What are the challenges faced by educational institutions in implementing and sustaining changes in learning space design post-COVID-19, and how are these challenges being addressed?
iv. To what extent do the redesigned learning spaces contribute to fostering a sense of community and collaboration among students in the post-pandemic educational environment.

By understanding how to create environments that support diverse learning needs and preferences, institutions can improve student engagement, satisfaction, and success. This research will contribute valuable insights to educators, administrators, and policymakers striving to adapt to the new educational landscape

2 Methodoloy

The present study utilizes a systematic literature review approach to illuminate the obstacles encountered by higher education institutions, teachers, and students during the redesign of the learning environment following the pandemic, as well as the strategies implemented to ensure inclusivity and accessibility for all stakeholders. According to Higgins et al. (2019), a systematic review is a research process that attempts to present an accurate and up-to-date summary of primary research to answer particular research questions. The PRISMA statement's guidelines are followed when performing a systematic review (Page et al., 2021). The PRISMA 2020 checklist, which is intended especially for conducting systematic literature reviews, had been used by the study's researchers (Tugwell & Tovey, 2020).

2.1 Search Strategy

Journals discussing the move from traditional classroom settings to the "new normal" in higher education as a result of COVID-19 are the main subject for consideration in this review. Published articles from the period of the global epidemic 2020 to 2025 were taken into consideration. Keywords such as "learning space", "post-pandemic education," "collaborative learning," "teaching and learning," "COVID-19," "student engagement," and "higher education institution" were utilized to search for relevant articles on Scopus while additional articles were also sourced from Google Scholar. For the purpose of ensuring a thorough examination of the topic, more searches were conducted using terms like "blended learning," "online learning," and "distance learning."

2.2 Eligibility Criteria

In order to identify studies that support the goals of the current research and to guarantee correct data gathering from the sources, inclusion and exclusion criteria were used. Using the predetermined inclusion criteria, the titles and abstracts of the identified publications were first evaluated as part of the screening process (Author et al., 2023; Fajrie et al., 2024). From the search, articles from conference papers, having different results from the research inquiries, duplicate publications, as well as articles before the pandemic on the subject matter were excluded from the findings (Table 1). The articles that fulfilled the inclusion criteria were then carefully read through in their entirety. Furthermore, the study concentrates on English-language publications to ensure uniformity throughout the evaluation procedure.

Table 1 Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Year	2020 – 2024	Below 2020
Language	English	Non-English
Paper type	Peer-reviewed scholarly articles	Conference, books, book chapters, news.
Level of education	Higher education	K-1, primary school and high school

Following this drawn-out procedure, a total of forty-one publications were evaluated and included in the review based on how well they addressed the research topics. Applicable using a standardized data extraction form, information including author names, publication year, country of origin, study title, research methods, conclusions, and the journals in which the studies were published was extracted from the eligible publications. For clarity and simplicity of study, this data was arranged in a consistent format and methodical manner (Rus et al., 2023; Utaminingsih et al., 2023). By doing a descriptive analysis of the gathered data set, the analysis sought to discover and display frequencies, percentages, as well as the themes, concepts, and meanings that surfaced from the data (Salisu et al., 2024). This methodology facilitated a thorough comprehension of the subject matter and allowed for significant analysis of the results. The PRISMA flow diagram for the literature search is shown in Figure 1

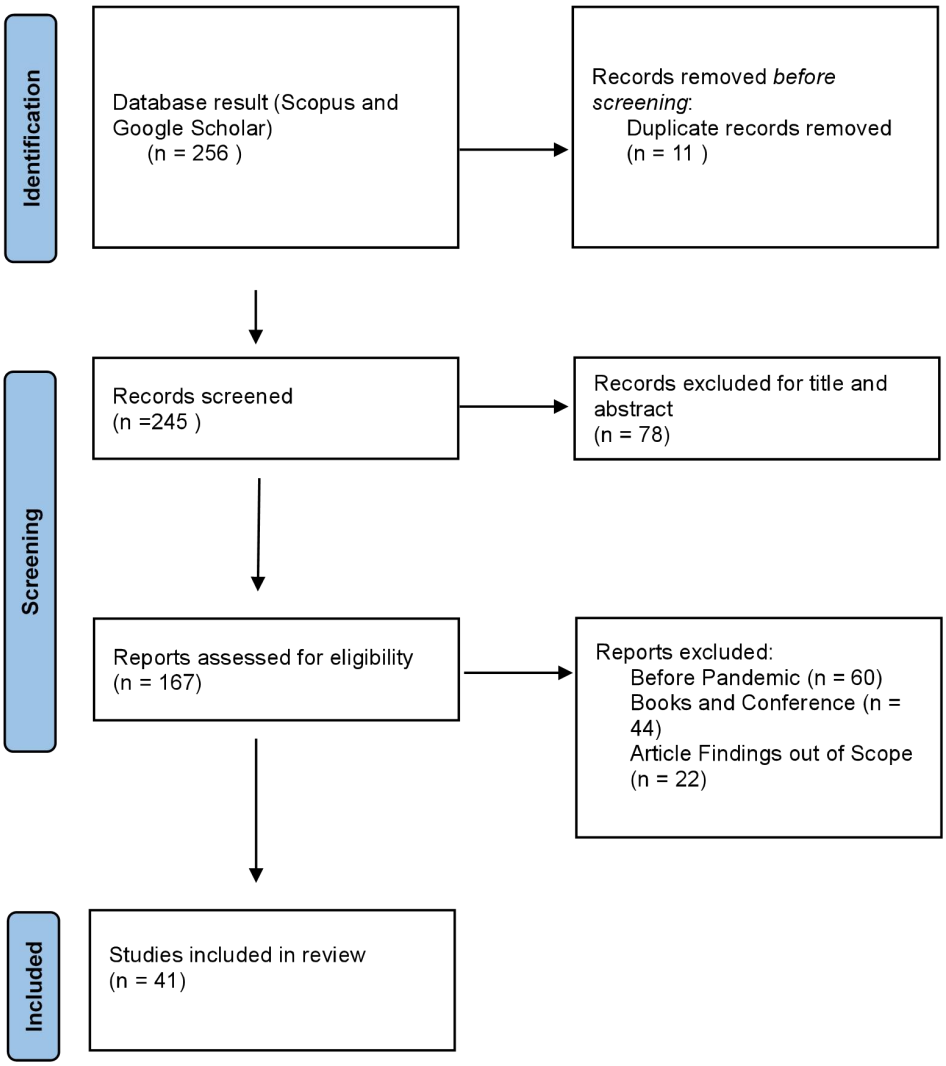

Figure 1 PRISMA flow diagram

3 Results

Findings from the review gave insight into possible challenges arising in academic space since the advent of COVID-19, including the impact on academic institutions and instructors. Student concerns in terms of participation and focus to take advantage of the solutions provided by institutions were given proper insight. In order to create a sense of inclusivity, community, and accessibility in the educational environment, many of the journals talked more about flexibility and blended learning, which were implemented during and after the crisis. This evaluation provides relevant information about the research questions, including study attributes like publication year, author affiliations, contributions from indexing services, and contributions by nation. Table 2 shows the data extraction table.

3.1 Literature Distribution

Publication by Year

The yearly distribution of the studies included in this review shows a clear pattern reflecting the evolving focus on learning space redesign in the post-pandemic era. Publications peaked in 2021, with 15 articles (figure 2), indicating an immediate scholarly response to the educational disruptions caused by COVID-19 and the urgent need to explore alternative learning environments. This surge was followed by a decline in 2022, with 6 articles, and a moderate rise

in 2023, which produced 9 articles, suggesting continued but more focused interest as institutions stabilized and adapted to hybrid learning systems. The years 2020, 2024, and 2025 recorded 4, 4, and 3 articles, respectively, reflecting the early stages of the pandemic and the later period when research began to diversify into other post-pandemic educational issues. Overall, the distribution highlights that the most intensive scholarly engagement with learning space redesign occurred during the first two years following the pandemic, with sustained but gradually diminishing research activity in subsequent years.

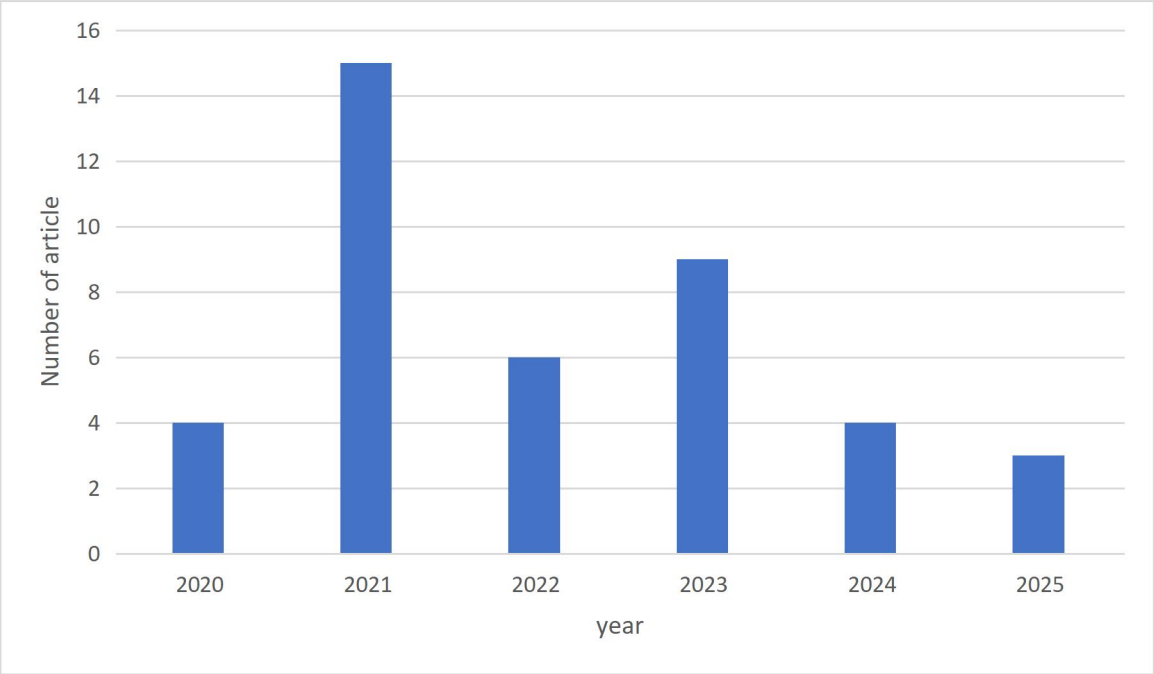

Figure 2 Publication year of reviewed articles

Author's Affiliation

Table 2 Data Extraction Table

S/N	Author (Year)	Method	First Author Country	Journal
1	Whelehan (2020)	Qualitative	Ireland	AISHE-J
2	Sato et al. (2024)	Qualitative	Spain	MDPI
3	Al Ansi & Al Ansi (2021)	Mixed-method	Indonesia	Solid State Technology
4.	Wester et al. (2021)	Qualitative	USA	Journal of Microbiology & Biology Education
5.	de Klerk & Palmer (2021)	Qualitative	South Africa	Perspectives in Education
6.	Korkmaz & Toraman (2020)	Qualitative	Turkey	IJTES
7.	Rasli et al. (2022)	Qualitative	Malaysia	Frontiers in Education
8.	Neuwirth et al. (2021)	Qualitative	USA	Journal of Adult and Continuing Education
9.	Jacques et al. (2023)	Qualitative	France	MDPI
10.	Pelayo & Pelayo (2020)	Quatitative	Philippines	International Journal of Innovative Science and Research Technology
11.	Passos et al.(2022).	Qualitative	Brazil	International Journal for Innovation Education and Research

12.	Papaioannou et al. (2023)	Qualitative	Greece	Trends in Higher Education
13.	Khan et al. (2021).	Qualitative	China	Frontiers of Psychology
14.	Gopinathan et al. (2022).	Quantitative	Malaysia	Sustainability
15.	Zarzycka et al. (2021).	Quantitative	Poland	Cogent art and Humanities
16	Yang et al. (2023)	Qualitative	China	Smart Learning Environment
17	Amro (2022)	Qualitative	UAE	iJADE (International Journal of Art & Design Education)
18	Bashir et al. (2021)	Qualitative	UK	Frontiers in Education
19	Porter et al. (2021)	Qualitative	USA	International Journal of Multicultural Education
20	Peruzzo & Allan (2024)	Qualitative	UK	Routledge Taylor & Francis Group
21	Letzel-Alt et al. (2022)	Qualitative	Germany	Frontiers in Education
22	Singh et al. (2021)	Qualitative	USA	Journal of Educational Technology Systems
23	Guzzo et al. (2023)	Qualitative	Italy	MDPI
24	Deka (2021)	Qualitative	India	Journal of Management in Practice
25	Hollister et al. (2022)	Qualitative	USA	Frontiers in Education
26	Rapanta et al. (2021)	Qualitative	Portugal	Post digital Science and Education
27	Dayagbil et al. (2021)	Mixed-Method	Philippines	Frontiers in Education
28	Javaid et al. (2023)	Qualitative	India	BenchCouncil Transactions on Benchmarks, Standards and Evaluations
29	Ulanday et al. (2021)	Qualitative	Philippines	Asian Journal of Distance Education
30	Saha et al. (2023)	Qualitative	Bangladesh	Humanities And Social Sciences Communication
31	Kedraka & Kaltsidis (2020).	Quantitative	Greece	European Journal of Education Studies
32	Edmunds & Little (2025)	Quantitative	Canada	The Canadian Journal for the Scholarship of Teaching and Learning
33	Dayagbil et al. (2021)	Mixed method	Philippines	Frontiers in education
34	El Galad et al. (2024)	Quantitative	Canada	Frontiers in education
35	McCorkle (2021)	Qualitative	USA	Journal of Learning Spaces
36	Ifeanyi (2023)	Qualitative	South Africa	Social Sciences & Humanities Open
37	Wang et al. (2024)	Quantitative	China	BMC Medical Education
38	Fedeli & Taylor (2023)	Quantitative	Italy	Tuning Journal for Higher Education
39	Dulfer et al. (2025)	Quantitative	Australia	Teaching in Higher Education
40	Kearney et al. (2025)	Qualitative	United Kingdom	Innovations in Education and Teaching International
41	Geary et al. (2023)	Quantitative	Australia	Journal of University Teaching and Learning Practice

3.2 Cluster Analysis

Following the study methodology proposed in this literature, the last stages of data processing were cluster analysis, visualization, interpretation, and reporting, which came before the results were discussed. The goal of this step was to find primary sets of co-related patterns and common trends in a network of keywords (Rosário & Raimundo, 2024). As a result, utilizing the primary keywords, a bibliometric analysis was done in Figure 4 to examine and find

indicators of the dynamics and evolution of scientific material. Using the scientific program VOSviewer, the bibliometric research results were analyzed.

Figure 3 displays the related keywords, making it easier to understand the network of keywords that appeared together or were linked in each scientific paper, to anticipate future research trends, and to understand the themes that have been researched. The majority of the network nodes are displayed in this figure. The number of times a keyword occurs, or its occurrence, is represented by the size of a node. The co-occurrence of keywords is indicated by the connections between the nodes, and the frequency of co-occurrence of those keywords is indicated by the thickness of each link. Therefore, a keyword's occurrence is more common the larger the node, and its simultaneous occurrence is more common the thicker the connection between nodes. A thematic cluster is represented by each hue, and its subject (nodes) can be explained using both the cluster's nodes and links. Furthermore, it illustrates the connections (links) among the subjects (nodes).

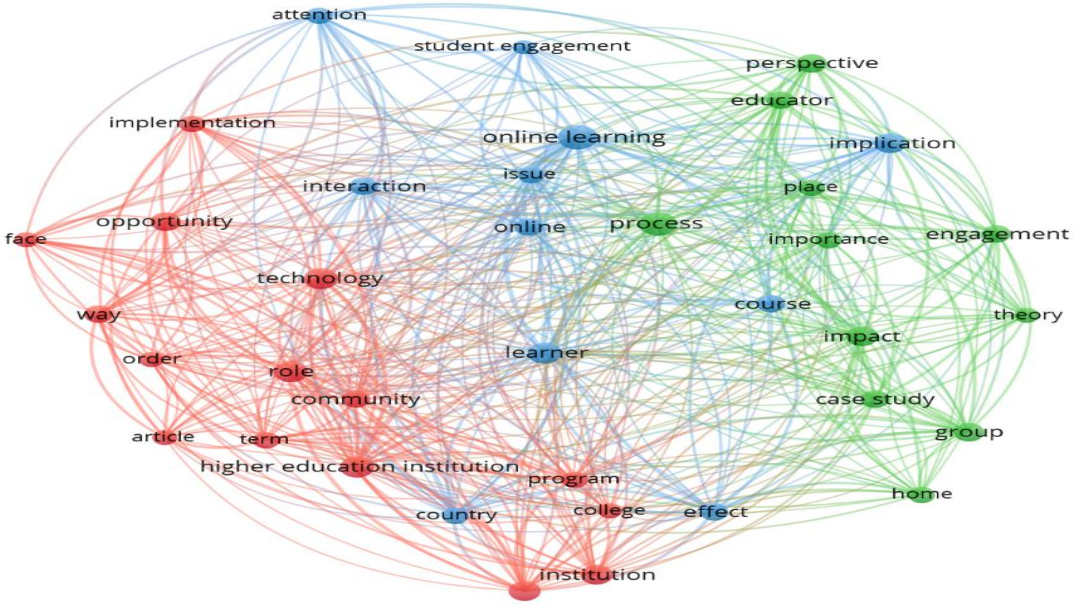

Figure 3 Network of Keywords

Therefore, under the themes of online learning, impact, and higher education institutions (HEIs), the Vos viewer Keyword Development Map outputs were split into three main clusters of terms. To record conversations about the study issues that were first discovered in the review, the three clusters were chosen from the keywords map. Online learning encompasses the redesign of learning spaces from physical to virtual, while impact discuss implications for student participation, community building, collaboration, and post-pandemic flexibility. The issues that Higher Education Institutions (HEIs) confront in revamping their learning spaces, solutions, HEI communities, technology uptake, etc., are included in the higher education cluster.

4 Discussions

4.1 Impact of Learning Space Design on Student Engagement and Participation

Based on findings from the included studies, we deduced that some authors were precise in their research, giving the medium and type of new design that was investigated in their research. We noticed most of the new design that were discussed were centered around online and virtual learning, as shown in Table 3. The review revealed that redesigned learning spaces, especially online, hybrid, and flexible environments, have significantly influenced student engagement and participation. Across studies, digital platforms such as Google Classroom, Zoom, and social-media-

supported learning spaces fostered improved immediacy, collaboration, and learner–content interaction (Ulanday et al., 2021; Gopinathan et al., 2022). This aligns with Gopinathan et al.'s (2022) conclusion that digital collaboration tools were essential for sustaining participation during lockdown and remain relevant post-pandemic.

Student engagement was also linked to the design of online learning tasks and the quality of instructor presence. Zarzycka et al. (2021) and Hollister et al. (2022) observed that structured digital interactions increased peer collaboration and communication, helping students feel connected despite physical separation. Yang et al. (2023) further showed that strategies such as lecture recording, clear course summaries, and screen-sharing enhanced engagement in emergency remote teaching, thereby reaffirming earlier models of cognitive, behavioural, and emotional engagement.

Recent evidence also indicates that purpose-built active learning environments markedly boost student engagement. For example, Edmunds and Little (2025) compared students in a high-tech active learning classroom versus a traditional layout and found no difference in academic performance but significantly higher enjoyment and engagement in the high-tech space

Table 3 Identified redesign space techniques from reviewed articles

S/N	Learning Space	Authors	No. of Journals	Platform
1	Digital Collaborative Learning	Whelehan (2020); Gopinathan et al. (2022); Khan et al. (2021);Yang et al. (2023); Bashir et al. (2021); Peruzzo & Allan (2024); Deka (2021); Hollister et al. (2022); M. Javaid et al. (2023)	9	Google Classroom & Google Meet, Social Media Blog, ChatGPT
2	Flexible Learning	de Klerk & Palmer (2021); Rasli et al. (2022); Pelayo & Pelayo (2020); Passos et al.(2022); Rapanta et al. (2021); Dayagbil et al. (2021); Ulanday et al. (2021); Saha et al. (2023).	8	Facebook, Google meet, Google Class, Zoom
3	Distance Learning	Neuwirth et al. (2021); Zarzycka et al. (2021); Sato et al. (2024); Korkmaz & Toraman (2020); Amro (2022); Porter et al. (2021); Letzel-Alt et al. (2022); Guzzo et al. (2023).	8	Virtual Classroom, Online (FB & LinkedIn)
4	Blended Learning	Al Ansi & Al Ansi (2021); Sébastien et al. (2023); Wester et al. (2021); Papaioannou et al. (2023); Singh et al. (2021).	5	Physical classroom and online learning

4.2 Implementation Challenges and Institutional Responses

Resource inequity was particularly pronounced among students lacking private study spaces, devices, and reliable internet (Neuwirth et al., 2021). Instructors similarly reported workload intensification, insufficient training, and difficulty sustaining student interest in virtual settings (Hollister et al., 2022; Korkmaz & Toraman, 2020).

A primary challenge cited in recent studies is the physical limitation of existing infrastructure when attempting to implement hybrid models. McCorkle (2021) noted that, retrofitting legacy classrooms for active learning is frequently hampered by unmet equipment needs and campus logistics, such as the lack of flexible furniture or inadequate power sources for student devices.

The integration of technology into physical spaces, the creation of smart campuses presents its own set of barriers. While digital displays and wireless sharing capabilities are essential for collaborative learning, the disparity in access to these technologies creates an equity gap. Ifeanyi (2023) highlight that student in remote or under-resourced campuses often face technological constraints and a lack of learning devices, rendering high-tech classroom designs ineffective for a significant portion of the student body. This digital divide extends to the physical classroom, where students joining remotely may feel disconnected or "second-class" compared to their in-person peers due to poor audio-visual integration.

The successful implementation of new spatial designs is inextricably linked to faculty readiness. A recurring theme in the literature is the pedagogical friction that occurs when physical spaces change faster than teaching methods (McCorkle, 2021). Faculty members, often exhausted from the pandemic's demands, face increased workload and burnout when asked to master complex hybrid environments. Innovative spaces like Active Learning Classrooms (ALCs) require a shift from teacher-centered to student-centered pedagogies. Without adequate training, expensive active learning spaces risk being used for traditional lecturing, negating the investment (Fedeli & Taylor, 2023; Ifeanyi, 2023).

4.3 Flexibility in Learning Space Design for Uncertainty

Flexibility emerged as a core attribute of effective post-pandemic learning space redesign. Flexible learning accommodates multiple modalities synchronous, asynchronous, in-person, hybrid, and experiential and allows students to participate under varying personal, technological, or health-related circumstances (Pelayo & Pelayo, 2020; Rasli et al., 2022). Passos et al. (2022) argued that flexible classroom design enables personalization and supports different cognitive states, learning rhythms, and social needs. Rapanta et al. (2021) similarly emphasized that flexibility ensures continuity of instruction even during unexpected disruptions such as pandemics or political crises. The COVID-19 experience has underscored this: universities are urged to "migrate to flexible teaching and learning modality" by recalibrating curricula, training faculty, and upgrading infrastructure to sustain continuity.

From the student perspective, flexibility is highly valued. El Galad et al. (2024) found a clear post-pandemic preference for hybrid and asynchronous options, students increasingly want choices about where and when they learn. They conclude that flexibility "humanizes teaching and learning" by accommodating diverse needs and offering broad access, though it also requires careful planning. In line with this, policy-makers and educators are now conceptualizing learning environments that blend settings.

4.4 Fostering Community and Collaboration in Redesigned Spaces

A recurring theme across the reviewed studies was the need to rebuild a sense of community after prolonged isolation. Redesigned learning spaces whether virtual, hybrid, or physical, played a major role in reconnecting students academically and socially. Digital collaboration platforms (e.g., Google Workspace, Microsoft Teams, Padlet, blogs, and social media) supported peer-to-peer interactions and collective problem-solving (Khan et al., 2021; Gopinathan et al., 2022). These platforms also reduced barriers for shy or marginalized students by offering alternative communication channels (Pelayo & Pelayo, 2020).

Redesigned learning spaces extend into the virtual realm as well. Recent studies highlight that online platforms and hybrid modalities can also foster belonging and teamwork when structured intentionally. Dulfer et al. (2025) report that in fully online postgraduate courses, thoughtful course architecture and pedagogy explicitly supporting learner–learner and learner–instructor interactions led to a markedly enhanced sense of belonging. Kearney et al. (2025) likewise demonstrate that an international online learning environment (OLE) connecting students at a UK university and its Chinese partner enabled active cross-campus engagement: when students fully engaged with the platform, they co-created positive learning experiences and felt more connected to each other. Geary et al. (2023) further confirm that Australian university students who perceived a strong learning community and social connectedness in their online courses reported much higher course satisfaction. These studies collectively show that building virtual spaces for interaction through discussion forums, group projects, and synchronous video collaboration can replicate some benefits of in-person community.

5 Conclusions

The COVID-19 pandemic accelerated an unprecedented transformation in the design and use of learning spaces in higher education. This systematic review demonstrates that redesigned learning environments spanning digital, hybrid, and flexible modalities have fundamentally reshaped how students engage, participate, and collaborate. Evidence across the included studies confirms that online platforms, active learning technologies, and flexible configurations improved interaction and supported continuity, especially when traditional classroom access was disrupted. At the same time, the review highlights significant challenges that institutions faced in implementing and

sustaining these changes. Unequal access to devices and internet connectivity, limited institutional infrastructure for hybrid delivery, and insufficient faculty preparedness emerged as major barriers. Despite these obstacles, universities adapted through targeted technological investment, digital literacy initiatives, and pedagogical restructuring. Flexibility was found to be essential for navigating prolonged uncertainty. Hybrid, blended, and asynchronous models offered learners greater autonomy and accessibility, enabling learning to continue across varying personal, health, and environmental conditions. Equally important, redesigned learning spaces helped rebuild a sense of community that was eroded during the pandemic. Digital collaboration tools, virtual communities, and interactive hybrid spaces enabled peer connection, group work, and shared learning experiences. Overall, the findings underscore that learning space redesign is not merely a response to crisis but a long-term strategic imperative. Higher institutions must continue to innovate, integrate inclusive technologies, and design environments that support diverse learners in a rapidly evolving educational landscape.

Social and Practical Implication

The redesigned learning spaces identified in this review have significant social implications for higher education. By expanding access through hybrid and digital formats, these spaces help reduce educational inequities and support students who face technological, geographical, or personal constraints. They also play a key role in rebuilding social connection after the pandemic, as flexible and technology-enhanced environments enable stronger peer interaction, collaboration, and a renewed sense of community among learners. Additionally, digital platforms now facilitate broader intercultural engagement, allowing students from different regions to work together more easily.

Practically, the findings offer clear guidance for institutions seeking to strengthen teaching and learning in the post-pandemic era. Universities must invest in reliable digital infrastructure, hybrid classroom technologies, and flexible physical layouts that support active learning. Faculty development is essential, as instructors require ongoing training to effectively use digital tools and manage hybrid learning environments. Policymakers and educational leaders should also address digital divides by ensuring equitable access to devices and learning resources. Overall, the review underscores that redesigning learning spaces is a long-term strategy for creating resilient, inclusive, and adaptable educational systems.

Implications for Policy Formation

The review underscores the need for policies that support equitable and sustainable learning space redesign in higher education. Policymakers should prioritize improved digital infrastructure, consistent standards for hybrid and flexible learning, and measures that reduce digital inequities. Institutions also require policies that mandate ongoing faculty training in digital pedagogy and allocate dedicated funding for technology upgrades and maintenance. Clear and proactive policy direction is essential to ensure redesigned learning spaces remain effective, inclusive, and resilient in future disruptions.

Counterintuitive Findings for Scholarly Discussion

Contrary to the common belief that remote work hinders collaboration, some studies suggest that digital tools can actually enhance team collaboration by providing more structured and inclusive communication channels. Tools like video conferencing, collaborative document editing, and project management software can foster real-time collaboration and ensure that all team members, regardless of location, have equal opportunities to contribute. This structured environment can lead to more organized and efficient teamwork, countering the notion that physical proximity is essential for effective collaboration.

While digital burnout is a concern in the remote work era, research indicates that well-designed digital learning environments with appropriate breaks and support can mitigate this risk. It challenges the idea that increased screen time inevitably leads to fatigue, suggesting that proper management and the inclusion of breaks can maintain productivity and well-being. Additionally, in some cases, low-tech or no-tech solutions may prove more effective for specific learning objectives, particularly for students who struggle with digital literacy or have limited access to technology. This indicates that a balanced approach, combining both high-tech and low-tech solutions, can cater to diverse learning needs more effectively.

Suggestions for Future Research

To advance our understanding of the impacts of remote and hybrid learning, it is crucial to conduct longitudinal studies that track student engagement, achievement, and well-being over time. Such research would provide valuable insights into how these learning environments affect students in the long term, helping educators and policymakers make informed decisions. Additionally, investigating the most effective digital literacy programs for diverse populations can identify best practices for teaching digital skills and reducing digital divides, ensuring all students have equal access to the benefits of digital learning.

Exploring the effectiveness of inclusive pedagogical practices in both physical and virtual classrooms is essential to understanding how these methods impact student engagement, retention, and success, particularly for underrepresented groups. Furthermore, studying the impact of work-life balance policies on employee productivity and well-being in remote and hybrid work settings can help organizations design supportive policies that promote health and organizational goals. Finally, researching technological integration in low-resource educational settings is necessary to identify cost-effective tools and strategies that enhance learning without significant financial investment, making quality education accessible to all students.

Acknowledgement

The authors wish to express their sincere appreciation to the reviewer and the editorial team for their valuable comments and constructive suggestions, which have significantly enhanced the quality and clarity of this work.

Funding

The authors declare that no financial support was received for the research, authorship, and publication of this article.

Conflict of Interest

The authors declare no conflicts of interest.

Declaration of Use of Generative AI

Generative AI tools were used exclusively for layout formatting, paraphrasing, and grammar correction.

References

Al Ansi, A. M., & Al-Ansi, A. (2020). Future of education post covid-19 pandemic: reviewing changes in learning environments and latest trends. *Solid State Technology*, 63(6), 201584-201600.

Al-Ansi, A. M., Suprayogo, I., & Abidin, M. (2019). Impact of information and communication technology (ICT) on different settings of learning process in developing countries. *Science and Technology*, 9(2), 19-28. https://doi.org/10.5923/j.scit.20190902.01

Alizadeh, H., Sharifi, A., Damanbagh, S., Nazarnia, H., & Nazarnia, M. (2023). Impacts of the COVID-19 pandemic on the social sphere and lessons for crisis management: a literature review. *Natural Hazards*, 117(3), 2139-2164.' https://doi.org/10.1007/s11069-023-05959-2

Amro, D. K. (2022). The impact of COVID-19 lockdown on design students' performance case study in the UAE. *International Journal of Art & Design Education*, 41(1), 108-124.

Aslam, S. (2021). Platforms and Tools used for Online Learning all over the World during Covid-19: A Study. *Available at SSRN 4587912*. https://doi.org/10.2139/ssrn.4587912

Bamiro, N. B., Zakariya, Z. B., & Nasiru, B. A. (2023). Development of halal entrepreneurship framework through business incubator service for sustainability using PRISMA. *Contemporary discourse of halal and Islamic entrepreneurship*, 79-97.

Bashir, A., Bashir, S., Rana, K., Lambert, P., & Vernallis, A. (2021, August). Post-COVID-19 adaptations; the shifts towards online learning, hybrid course delivery and the implications for biosciences courses in the higher education setting. In Frontiers in education (Vol. 6, p. 711619). *Frontiers Media SA*. https://doi.org/10.3389/feduc.2021.711619

Carey, K. (2020). *The Future of College in a Post-Pandemic World*. The New York Times.

Casanova, D. (2014, December). Redesigning learning spaces through students and academics contributions: the role of participatory design. In *SRHE Conference 2014: SRHE Annual Research Conference: Inspiring Future Generations; Embracing Plurality and Difference in Higher Education*.

Dayagbil, F. T., Palompon, D. R., Garcia, L. L., & Olvido, M. M. J. (2021). Teaching and learning continuity amid and beyond the pandemic. In Frontiers in Education (Vol. 6, p. 678692). *Frontiers Media SA.* https://doi.org/10.3389/feduc.2021.678692

De Klerk, E. D., & Palmer, J. M. (2021). Resetting education priorities during COVID-19: Towards equitable learning opportunities through inclusion and equity. *Perspectives in Education*, 39(1), 12-28. https://doi.org/10.18820/2519593X/pie.v39.i1.2

Deka, P. K. (2021). Factors influencing student engagement in online learning during the COVID-19 pandemic period in India*. Journal of Management in Practice*, 6(1).

Dhawan, S. (2020). Online learning: A panacea in the time of the COVID-19 crisis. Journal of *Educational Technology Systems*, 49(1), 5-22. https://doi.org/10.1177/0047239520934018

Dulfer, N., Gowing, A., & Mitchell, J. (2025). Building belonging in online classrooms: relationships at the core. *Teaching in Higher Education*, *30*(4), 1024-1040. https://doi.org/10.1080/13562517.2024.2346081

Edmunds, T. K., & Little, R. (2025). Impacts of the Active Learning Classroom on Student Learning and Engagement: The Role of Technology. *The Canadian Journal for the Scholarship of Teaching and Learning*, *16*(1).

El Galad, A., Betts, D. H., & Campbell, N. (2024, April). Flexible learning dimensions in higher education: aligning students' and educators' perspectives for more inclusive practices. In *Frontiers in Education* (Vol. 9, p. 1347432). Frontiers Media SA. https://doi.org/10.3389/feduc.2024.1347432

Eringfeld, S. (2021). Higher education and its post-coronial future: utopian hopes and dystopian fears at Cambridge University during Covid-19. *Studies in Higher Education*, 46(1), 146-157. https://doi.org/10.1080/03075079.2020.1859687

Espino-Díaz, L., Fernández-Caminero, G., Hernández-Lloret, C. M., González-González, H., Álvarez-Castillo, J. L. (2020). Analyzing the impact of COVID-19 on education professionals. Toward a paradigm shift: ICT and neuroeducation as a binomial of action. *Sustainability*, 12(14), 5646. https://doi.org/10.3390/su12145646

Farnell, T., Skledar Matijevic, A., & Ščukanec Schmidt, N. (2021). *The Impact of COVID-19 on Higher Education: A Review of Emerging Evidence. Analytical Report*. European Commission. Available from: EU Bookshop. https://doi.org/10.2766/069216

Fedeli, M., & Taylor, E. W. (2023). The impact of an active-learning designed faculty development program: A students' perspective of an Italian university. *Tuning Journal for Higher Education*, *11*(1), 151-174. https://doi.org/10.18543/tjhe.2513

Geary, E., Allen, K. A., Gamble, N., & Pahlevansharif, S. (2023). Online learning during the COVID-19 pandemic: Does social connectedness and learning community predict self-determined needs and course satisfaction?. *Journal of University Teaching and Learning Practice*, *20*(1), 1-26. https://doi.org/10.53761/1.20.01.13

Gopinathan, S., Kaur, A. H., Veeraya, S., & Raman, M. (2022). The role of digital collaboration in student engagement towards enhancing student participation during COVID-19. *Sustainability*, 14(11), 6844. https://doi.org/10.3390/su14116844

Guzzo, T., Ferri, F., & Grifoni, P. (2023). Lessons learned during COVID-19 and future perspectives for emerging technology. *Sustainability*, 15(14), 10747. https://doi.org/10.3390/su151410747

Higgins, J. P.T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M.J, & Welch, V.A. (eds.) (2019). Cochrane Handbook for Systematic Reviews of Interventions (2nd ed.) Chichester, UK: John Wiley Sons

Hollister, B., Nair, P., Hill-Lindsay, S., & Chukoskie, L. (2022). Engagement in online learning: student attitudes and behavior during COVID-19. In Frontiers in education (Vol. 7, p. 851019). *Frontiers Media SA*.

Hosseinzadeh, P., Zareipour, M., Baljani, E., & Moradali, M. R. (2022). Social consequences of the COVID-19 pandemic. A systematic review. *Investigacion y educacion en enfermeria*, 40(1). https://doi.org/10.17533/udea.iee.v40n1e10

Ifeanyi, F. O. (2023). Barriers to learning linger into post-pandemic for multi-campus institutions in developing nations: A case of the University of The Free State. *Social Sciences & Humanities Open*, *7*(1), 100438.

Indergård, K., & Hansen, G. K. (2024). Academic work–something else?. *Journal of Corporate Real Estate*, 26(2), 113-130.

Jacques, S., Ouahabi, A., & Kanetaki, Z. (2023). Post-COVID-19 education for a sustainable future: Challenges, emerging technologies and trends. *Sustainability,* 15(8), 6487.

Javaid, M., Haleem, A., Singh, R. P., Khan, S., & Khan, I. H. (2023). Unlocking the opportunities through ChatGPT Tool towards ameliorating the education system. *BenchCouncil Transactions on Benchmarks, Standards and Evaluations*, *3*(2), 100115.

Kearney, T., Raddats, C., & Qian, L. (2025). Enabling international student engagement through online learning environments. *Innovations in Education and Teaching International*, *62*(4), 1291-1304.

Kedraka, K., & Kaltsidis, C. (2020). Effects of The Covid-19 Pandemic on University Pedagogy: Students' Experiences And Considerations. *European Journal of Education Studies*, 7(8).

Khan, M. N., Ashraf, M. A., Seinen, D., Khan, K. U., & Laar, R. A. (2021). Social media for knowledge acquisition and dissemination: The impact of the COVID-19 pandemic on collaborative learning driven social media adoption. *Frontiers in Psychology*, 12, 648253.

Korkmaz, G. & Toraman, Ç. (2020). Are we ready for the post-COVID-19 educational practice? An investigation into what educators think as to online learning. *International Journal of Technology in Education and Science (IJTES)*, 4(4), 293-309.

Lahti, M., Nenonen, S., Sutinen, E., & Pope, N. (2021). Radical innovation theory: Towards radical design of digital workplaces. In *A Handbook of Management Theories and Models for Office Environments and Services* (pp. 163-172). Routledge. https://doi.org/10.1201/9781003128786-14

Leijon, M., Nordmo, I., Tieva, Å., & Troelsen, R. (2022). Formal learning spaces in Higher Education–a systematic review. *Teaching in Higher Education*, 1-22. https://doi.org/10.1080/13562517.2022.2066469

Letzel-Alt, V., Pozas, M., Schwab, S., Schneider, C., Lindner, K. T., Dias, P., & Cadime, I. (2022). Exploring inclusive education in times of COVID-19: An international comparison of German, Austrian and Portuguese teachers. *In Frontiers in Education* (Vol. 7, p. 969737). Frontiers Media SA. https://doi.org/10.3389/feduc.2022.969737

Lohr, A., Stadler, M., Schultz-Pernice, F., Chernikova, O., Sailer, M., Fischer, F., & Sailer, M. (2021). On powerpointers, clickerers, and digital pros: Investigating the initiation of digital learning activities by teachers in higher education. *Computers in Human Behavior*, 119, 106715. https://doi.org/10.1016/j.chb.2021.106715

Masalimova, A. R., Khvatova, M. A., Chikileva, L. S., Zvyagintseva, E. P., Stepanova, V. V., & Melnik, M. V. (2022, March). Distance learning in higher education during COVID-19. In Frontiers in Education (Vol. 7, p. 822958). *Frontiers Media SA*. https://doi.org/10.3389/feduc.2022.822958

McCorkle, S. (2021). Exploring faculty barriers in a new active learning classroom: A divide and conquer approach to support. *Journal of Learning Spaces*, *10*(2).

Neuwirth, Lorenz S., Svetlana Jović, and B. Runi Mukherji (2021). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education* 27(2), 141-156.

Ninnemann, K., Liedtke, B., den Heijer, A., Gothe, K., Loidl-Reisch, C., Nenonen, S., ... & Wallenborg, C. (2020). *Hybrid environments for universities*. Waxmann Verlag.

OECD. (2020). Education and COVID-19: *Focusing on the long-term impact of school closures*. Retrieved July 14, 2024, from https://www.oecd-ilibrary.org/education/education-and-covid-19-focusing-on-the-long-term-impact-of-school-closures_2cea926e-en

Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *PLoS Med*. 2021, 18, e1003583

Papaioannou, G., Volakaki, M. G., Kokolakis, S., & Vouyioukas, D. (2023). Learning spaces in higher education: a state-of-the-art review. *Trends in Higher Education*, 2(3), 526-545.

Park, E. L., & Choi, B. K. (2014). Transformation of classroom spaces: Traditional versus active learning classroom in colleges. *Higher Education*, 68, 749-771.

Passos, A. D. Q., Jorge, E., Moreira, J. A., Miranda, J. G., Sales, K., & Saba, H. (2022). Architectural design of classroom to stimulate learning in higher education: an approach connected with neuroeducation and neuroarchitecture. *International Journal for Innovation Education and Research*, 10(4), 87-102.

Pelayo, E., & Pelayo, L. (2020). Flexible learning: a new learning design in this time of COVID-19 pandemic. *International Journal of Innovative Science and Research Technology*, 4(9), 76-79.

Peruzzo, F., & Allan, J. (2024). Rethinking inclusive (digital) education: Lessons from the pandemic to reconceptualise inclusion through convivial technologies. *Learning, Media and Technology*, 49(2), 244-258. https://doi.org/10.1080/17439884.2022.2131817

Porter, S. G., Greene, K., & Esposito, M. K. (2021). Access and inclusion of students with disabilities in virtual learning environments: Implications for post-pandemic teaching. *International Journal of Multicultural Education*, 23(3), 43-61.

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2021). Balancing technology, pedagogy and the new normal: Post-pandemic challenges for higher education. *Postdigital Science and Education*, 3(3), 715-742. https://doi.org/10.1007/s42438-021-00249-1

Rasli, A., Tee, M., Lai, Y. L., Tiu, Z. C., & Soon, E. H. (2022). Post-COVID-19 strategies for higher education institutions in dealing with unknown and uncertainties. In Frontiers in Education (Vol. 7, p. 992063). *Frontiers Media SA*. https://doi.org/10.3389/feduc.2022.992063

Rosário, A. T., & Raimundo, R. (2024). Sustainable Entrepreneurship Education: A Systematic Bibliometric Literature Review. *Sustainability*, 16(2), 784. https://doi.org/10.3390/su16020784

Rus, R. C., Salisu, M. A., Hussain, M. M., Kamal, M. M., Hanapi, Z., Idris, M. O., ... & Kayode, B. K. (2023). Systematic review of Malaysia technical and vocational education (TVET) sustainability framework to increase the marketability of graduates using PRISMA. *Jurnal Kejuruteraan*, *6*(2), 51-63. https://doi.org/10.17576/jkukm-2023-si6(2)-06

Saha, B., Atiqul Haq, S. M., & Ahmed, K. J. (2023). How does the COVID-19 pandemic influence students' academic activities? An explorative study in a public university in Bangladesh. *Humanities and Social Sciences Communications*, 10(1), 1-10. https://doi.org/10.1057/s41599-023-02094-y

Saladino, V., Algeri, D., & Auriemma, V. (2020). The psychological and social impact of Covid-19: new perspectives of well-being. *Frontiers in psychology*, 11, 577684. https://doi.org/10.3389/fpsyg.2020.577684

Salisu, M. A., Ridzwan, C. R., Oyebamiji, Y. O., Usaizan, N., Abioye, A. E., Biola, I. F., ... & Luqman, H. (2024). Disruption of the Covid-19 pandemic on the agri-food sector: A systematic review of its implications in post-pandemic and future of food security. *AIMS Agriculture & Food*, 9(1).

Sato, S. N., Condes Moreno, E., Rubio-Zarapuz, A., Dalamitros, A. A., Yañez-Sepulveda, R., Tornero-Aguilera, J. F., & Clemente-Suárez, V. J. (2023). Navigating the new normal: Adapting online and distance learning in the post-pandemic era. *Education Sciences*, 14(1), 19.

Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for COVID-19, post vaccine, & post-pandemic world. *Journal of Educational Technology Systems*, 50(2), 140-171.

Temple, P., & Fillippakou, O. (2007). Learning spaces for the 21st century. *Higher Education Academy,* 1-80.

Tosto, S. A., Alyahya, J., Espinoza, V., McCarthy, K., & Tcherni-Buzzeo, M. (2023). Online learning in the wake of the COVID-19 pandemic: Mixed methods analysis of student views by demographic group. *Social Sciences & Humanities Open*, 8(1), 100598.

Tugwell, P., Welch, V. A., Karunananthan, S., Maxwell, L. J., Akl, E. A., Avey, M. T., ... & White, H. (2020). When to replicate systematic reviews of interventions: consensus checklist. *Bmj*, 370.

Ulanday, M. L., Centeno, Z. J., Bayla, M. C., & Callanta, J. (2021). Flexible learning adaptabilities in the new normal: E-learning resources, digital meeting platforms, online learning systems, and learning engagement. *Asian Journal of Distance Education*, 16(2). https://doi.org/10.5281/zenodo.5762474

UNESCO. (2020). *Education: From disruption to recover*y. Retrieved July 14, 2024, from WWW.UNESCO.ORG.

Utaminingsih, S., Fajrie, N., Bamiro, N. B., & Azman, M. N. A. (2023). Teachers and students perception of technology and sustainable adoption framework in the pedagogical process: A systematic review. *International Journal of Learning, Teaching and Educational Research*, *22*(12), 162-186. https://doi.org/10.26803/ijlter.22.12.9

Wang, X., Liu, J., Jia, S., Hou, C., Jiao, R., Yan, Y., ... & Liu, X. Y. (2024). Hybrid teaching after COVID-19: advantages, challenges and optimization strategies. *BMC Medical Education*, *24*(1), 753. https://doi.org/10.1186/s12909-024-05745-z

Weller, M. (2007). The distance from isolation: Why communities are the logical conclusion in e-learning. *Computers & Education*, *49*(2), 148-159. https://doi.org/10.1016/j.compedu.2005.04.015

Wester, E. R., Walsh, L. L., Arango-Caro, S., & Callis-Duehl, K. L. (2021). Student engagement declines in STEM undergraduates during COVID-19–driven remote learning. *Journal of microbiology & biology education*, 22(1), 10-1128. https://doi.org/10.1128/jmbe.v22i1.2385

Wheele, T., Lindkvist, C., Weber, C., Windlinger, L., & Haugen, T. (2023, May). Studying the influence of technology on the social connectedness of students: a hybrid university learning environment (HULE). In *IOP Conference Series: Earth and Environmental Science* (Vol. 1176, No. 1, p. 012009). IOP Publishing.

Wheele, T., Weber, C., Windlinger, L., Haugen, T., & Lindkvist, C. (2023). A narrative literature review using placemaking theories to unravel student social connectedness in hybrid university learning environments. *Buildings*, 13(2), 339.

Whelehan, D. F. (2020). Students as Partners: A model to promote student engagement in post-COVID-19 teaching and learning. *All Ireland Journal of Higher Education*, 12(3).

World Bank. (2021). *The impact of COVID-19 on education: Recommendations and opportunities for Ukraine*. World Bank. Retrieved July 14, 2024, from https://www.worldbank.org/en/news/opinion/2021/04/02/the-impact-of-covid-19-on-education-recommendations-and-opportunities-for-ukraine

Yang, D., Wang, H., Metwally, A. H. S., & Huang, R. (2023). Student engagement during emergency remote teaching: A scoping review. *Smart Learning Environments*, 10(1), 24. https://doi.org/10.1186/s40561-023-00240-2

Zarzycka, E., Krasodomska, J., Mazurczak-Mąka, A., & Turek-Radwan, M. (2021). Distance learning during the COVID-19 pandemic: students' communication and collaboration and the role of social media. *Cogent Arts & Humanities*, 8(1), 1953228.

Zhao, X., & Xue, W. (2023). From online to offline education in the post-pandemic era: Challenges encountered by international students at British universities. *Frontiers in Psychology*, 13, 1093475