Synchronous Online Teaching Practices: A Scoping Review

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ABSTRACT

This scoping review seeks to comprehensively summarise existing research on teaching practices employed in synchronous online learning, aiming to identify gaps in the literature and thereby contribute to the advancement and evaluation of future strategies for synchronous learning sessions. Employing a systematic scoping review methodology, the study searched three major databases—Scopus, ScienceDirect, and Web of Science—utilising the keywords 'synchronous' and 'teaching practices'. The research inquiries guiding this study are twofold: 1) To elucidate the spectrum of teaching practices utilised in synchronous online learning; and 2) To delineate the demographic and contextual characteristics that define the application of these teaching practices. Notably, the study excludes hybrid learning scenarios that involve face-to-face interaction. Inclusion criteria encompass publications in English, spanning the years 2015 to 2023, and teaching practices substantiated through scientific research. The chosen practices were meticulously reviewed based on study populations and contextual settings. In total, 13 synchronous online teaching practices were identified, and categorised according to the teaching presence elements of the Community of Inquiry Model (COI): design and organisation, direct instruction, and facilitating discourse. Most studies focused on university and higher education contexts, with limited representation at the K-12 level, particularly in elementary education.

Keywords
Synchronous learning; Teaching practices; Online Learning

Introduction

Teaching practices refer to the strategies, methods, and approaches educators use to facilitate learning and instruction in the classroom or educational setting. Teaching practices included a wide range of activities, such as creating lesson plans, delivering lectures, conducting class discussions, designing and administering assessments, providing feedback and guidance to students, and adapting teaching methods to meet the needs of individual learners (Martin, Kumar, Ritzhaupt, & Polly, 2023; Sharp, Norman, Spagnoletti, & Miller, 2021). Teaching practices vary depending on the subject matter, grade level, cultural context, and individual learning needs. In brick-and-mortar physical classrooms, there are many practices that educators may employ, such as lectures, group discussions, hands-on activities, inquiry-based learning, collaborative learning, integrating technology, etc. Due to the limitation of social interaction and personal connection with peers and teachers and geography dispersed, the teaching practices that work well in physical classrooms might not work well in an online setting.

In the synchronous online learning environment, teachers and students interact in real-time using video-conferencing software which consists of video, audio, and instant messaging (Grammens, Voet, Vanderlinde, Declercq, & De Wever, 2022; Martin, Ahlgrim-Delzell, & Budhrani, 2017). A synchronous online learning environment is enriched by different kinds of interactive tools and features, such as interactive whiteboards, polling, games, raise-hand gestures, discussion boards, and breakout rooms, which allow students to be separated virtually when conducting group discussions. The features available in synchronous online learning environment have overcome the disadvantages of asynchronous online learning environment by increasing the interactions between student-teacher and student-students (Kang & Zhang, 2020; Reguera & Lopez, 2021; Ross, Chase, Robbie, Oates, & Absalom, 2018). Nonetheless, when inappropriate teaching practices were adopted in synchronous online sessions as part of effective online learning, it could bring more harm than good.

Studies indicated that inappropriate teaching practices in synchronous online sessions caused unpleasant learning experiences in online learning (Bedenlier et al., 2021; Widikasih, Widiana, & Margunayasa, 2021). Most students felt bored and not interested to learn in virtual setting (Aristovnik, Keržič, Ravšelj, Tomaževič, & Umek, 2020; Bray, Banks, Devitt, & Ní Chorcora, 2021; Fyllos et al., 2021; Muslimin & Harintama, 2020; Rasmitadila et al., 2020; Thang et al., 2022; Usher et al., 2021) due to less social support (Anugrahana, 2020) and severe interaction difficulties (Daguang & Wen, 2020; Ho, Zhang, Li, & Zhang, 2023). In circumstances, studies reported that students preferred face-to-face learning to online learning. In addition, the studies related to online learning at K12 level were limited, (Arnesen, Hveem, Short, West, & Barbour, 2019; Barbour, 2018; Grammens et al., 2022; Martin, Bacak, Polly, & Dymes, 2021), educators were forced to adopt non-research-based practices in emergency remote teaching during pandemic in 2019, such as delivered instruction in one-way communication without providing any support (Flynn & Noonan, 2020), adopted lecture-based and teacher-centred approach in online learning (Aliyyah et al., 2020), only delivered outdated learning video which downloaded from YouTube as the primary source of instruction (Rasmitadila et al., 2020), etc. The situation got worsened when teachers and students were unprepared. Student online engagement became a crisis for students at all levels (Dhawan, 2020; Khlaif, Salha, & Kouraichi, 2021; Yong et al., 2021).

Research has been done before highlighted that the lack of effective technique by teachers to check student presence and understanding. (Heilporn, Lakhal, & Bélisle, 2021; Purarjomandlangrudi & Chen, 2019). The most used instructional method was question and answer (Q&A) (Rasmitadila et al., 2020) as it was the easiest way for teacher to measure students' understanding. The most frequently asked question in online learning was " Do you understand the content?" (Terzi & Çelik, 2005). Many studies which indicated that the inappropriate and ineffective online teaching practices, strategies, and teachers' support were the culprit of low online engagement (Chiu, 2021a, 2021b, 2021c; Kurt, Atay, & Öztürk, 2022; Li, Jin, Edirisingha, & Zhang, 2021).

Teaching presence in Community of Inquiry framework describes teachers' role in course designing and organisation, delivering direct instruction, and facilitating discourse to promote students' interest, active participation, and deep understanding of the knowledge and skills. There were three main elements in teaching presence, namely (1) design and organisation, which referred to the "planning and design of the structure, process, interaction and evaluation aspects of the online course" (Garrison & Arbaugh, 2007); (2) direct instruction, which referred to the "instructor's provision of intellectual and scholarly leadership, in part through sharing their subject matter knowledge with the students" (Garrison & Arbaugh, 2007); (3) facilitate discourse, which defined as "the means by which students are engaged in interacting about and building upon the information provided in the course instructional materials" (Garrison & Arbaugh, 2007). Teaching presence and teaching practices were inseparable. Functional practices developed based on the definition and scope of teaching presence promised a successful online learning. As part of effective online teaching, the synchronous online teaching has to be carefully designed and supported by appropriate teaching practices. Therefore, this study aimed to determine what are the appropriate and effective teaching practices that work well in synchronous online sessions before proceeding to further formulation and development.

In conceptualising of teaching presence in COI framework, this scoping review aimed to summarise teaching practices in synchronous online learning in the literature. The research questions developed in this study were: (1) What teaching practices are used in synchronous online learning? (2) What is the population and setting of these teaching practices?

Literature Review

The success of synchronous online educational delivery hinges on active learner engagement (Baxter & Hainey, 2022; Kurt et al., 2022). Appropriate and effective teaching practices are crucial in sustaining productive and functional synchronous online learning. Many studies have proposed suggestions and strategies for maximising synchronous online learning sessions.

A study by (Wang et al., 2022) indicated that the valuable strategies to engage learners in synchronous online learning were: (1) providing opportunities for instructors and peers to interact frequently; (2) having relevant content that could apply to practice; (3) involving interactive activities like group discussions and peer feedback; and (4) having informal conversations with individual learners. A study by (Chen, Ye, & Weng, 2022) showed that the main factor of good practices was the method of assigning tasks. According to the study, student participation was greatly

influenced by the richness of curriculum resources and the role played by teachers. Teachers' repetition was no longer the primary means of improving the retention of information.

Meanwhile, the student's interest in learning was stimulated and achieved through efficient knowledge transfer using creative teaching methods. Studies of (Ng, 2020; Vurdien, 2019) showed the differences between face-to-face and synchronous online sessions. Although video conferencing allowed multiple communication channels with nonverbal information such as tone of voice, gesture and facial expression in an asynchronous online setting, students would instead communicate in a face-to-face setting as the video conferencing setting appeared somewhat cold and less personal contact. Most of the studies suggested using the webcam, except (Ng, 2020) argued the mandatory video as the video of the webcam may be distracting or even voyeuristic to others, including the instructor. Studies of (Christensen, 2020; Henriksen, Creely, & Henderson, 2020) adopted Fold Pedagogy of Bruner to suggest synchronous online teaching practices using Do/Know/Think/ Manage. A study by (Khan, Atta, Sajjad, & Jawaid, 2022) suggested twelve tips to enhance student engagement in synchronous online teaching and learning, including real-time chatting, virtual whiteboards, interactive pads, breakout rooms, online polls, interactive video and quizzes, gamification, and short coffee-break to rejuvenate the participants. A study by (Sharp et al., 2021) suggested tips for maximising synchronous online learning sessions, focusing on the skills and confidence of hosting synchronous online sessions. Yet, these tips were suggested for medical students. The implementation of the practices in other disciplines needs more exploration.

Methodology

This study adopted the framework outlined by (Arksey & O'Malley, 2005) to conduct the scoping review. There were five critical phases in reviewing process, namely (1) identifying the research questions; (2) identifying the relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarising and reporting the results. First, a systematic search was conducted in three databases, namely Scopus, ScienceDirect journal, and Web of Science. The rationale for choosing these three databases was that Web of Science and Scopus was renowned for their extensive coverage of scholarly literature across various disciplines. They indexed thousands of high-quality journals, conference proceedings, patents, and other research publications. Web of Science and Scopus offered citation analysis features, allowing researchers to track the citation impact of specific papers and authors. This helped gauge the significance and influence of research within a particular field. ScienceDirect, on the other hand, was a leading full-text database that covered a wide range of scientific and technical research articles, making it a valuable source of in-depth information. The keywords that were used to search for the literature were "synchronous" and "teaching practices" (The exact keywords used were Synchronous AND "teaching practice"). Some studies did not include the keywords in their title; the researcher had to carefully screen the abstract and content to ensure the study met this study's criteria.

The articles were chosen based on the inclusion criteria: (1) published in English; (2) published between 2015-2023; (3) the teaching practices were tested and proved through scientific study method, and (4) the teaching practices were suggested after a scientific study process. The term " scientific study method " refers to the systematic approach scientists use to conduct research, gather evidence, and answer questions about an issue. It involves a process of investigation that follows a logical sequence of steps to ensure objectivity, reliability, and reproducibility of the finding. Before publishing their findings, scientists submitted their research to peer-reviewed scientific journals, which involved evaluation by independent experts in the field to ensure the study's rigour, validity, and relevance. Hence, this study excluded all grey literature but included all the primary studies and review papers. Table 1 presents the inclusion and exclusion criteria of this study.

Table 1. Inclusion and exclusion criteria in this study.

No	Inclusion Criteria	Exclusion Criteria
1	Published in the English Language	Not published in the English Language
2	Published between 2015-2023	Published before 2015
3	All primary studies and review papers	Exclude grey literature
4	Only online learning	Exclude hybrid learning, which may involve face-to-face interaction

5	Teaching practices which were tested and proved through or after the scientific study process	Excluded teaching practices in grey literature

Data Analysis

A total of 185 articles were found related to synchronous online teaching practices. After title and abstract screening, 63 articles were found related to the research question. All studies were checked to ensure that the studies focused mainly on online or remote learning. Those studies which involved face-to-face interaction as part of their study setting were excluded. In the end, 34 articles were reviewed through full-text access. There were 26 synchronous online teaching practices found in the process. After another round of review, five teaching practices were excluded as the study emphasised blended synchronous learning, which involved face-to-face interaction. However, the excluded practices were cited as references because the same practices were mentioned by other studies. 8 practices were collaged as they were similar. The teaching practices, the authors, the year of study and their population and setting were listed in a table carefully. Based on the conceptual framework of this study, all the teaching practices were coded and categorised under three themes: design and organisation, direct instruction, and facilitated discourse. The result of this review was presented in two sections; namely (1) teaching practices in synchronous online learning; and (2) population and setting of the study.

Results

Thirteen online teaching practices were found after filtration based on the inclusion and exclusion criteria. These teaching practices were carefully reviewed, coded and collated to avoid duplication. Similar teaching practices which addressed the same practices were collated and merged into one. As the concept of the study is teaching presence, hence, all the synchronous online teaching practices were categorised and grouped under three themes, (1) design and organisation, (2) direct instruction; and (3) facilitate discourse. Two other researchers checked and reviewed the process to eliminate biases and errors. The results and findings of this study were presented and discussed in the following sub-topics.

Synchronous Online Teaching Practice

There were 13 synchronous online teaching practices found in the literature from 2015 to May 2023. Based on the definition of teaching presence, the tasks such as creating presentation slides and lecture notes, developing audio/video lectures, providing personal insights into materials, creating schedules, and providing guidelines for using the medium were categorised under course design and organization. The tasks related to presenting content using various assessment and feedback methods and providing explanatory feedback that emphasises social presence and instructor immediacy were categorised under direct instruction. For category of facilitate discourse, tasks such as facilitating reflection and discourse, exchanging viewpoints, recognising areas of convergence and divergence, and striving for consensus and comprehension were grouped under it. The distribution of the synchronous teaching practices was presented (See Figure 1).

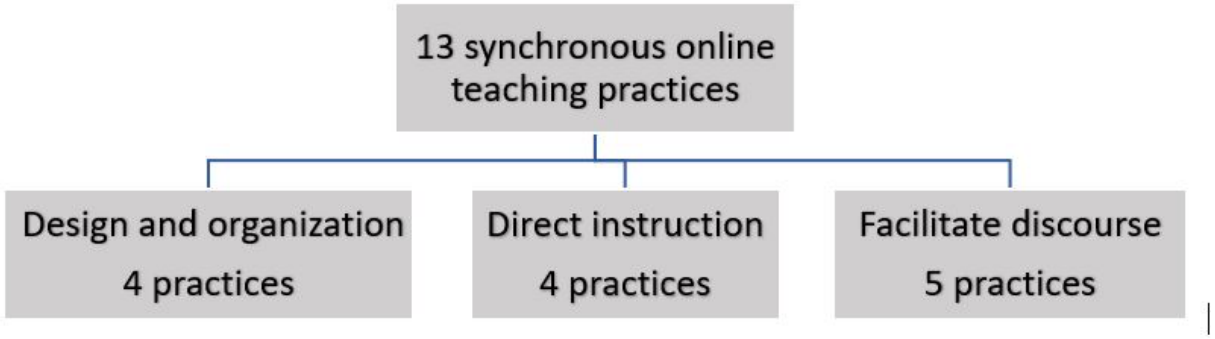

Figure 1. The distribution of the practices in this study.

The findings of teaching synchronous teaching practices were arranged under three main themes (design and organisation, direct instruction, and facilitating discourse) based on the concept of teaching presence in COI framework. The sub-themes and coding were added as descriptions to guide readers for a clearer picture of the teaching practices. The teaching practices under each theme were arranged based on the frequency mentioned in the studies. A few studies mentioned the same practices, and some practices were mentioned once or twice.

All the practices that involved design, course organisation and preparation before conducting synchronous online sessions were categorised under the design and organisation category. There were four practices in this category. Before conducting synchronous teaching, educators have to design and organise the flow of the real-time synchronous sessions, such as arriving earlier in the meeting room, welcoming and greeting students for their participation, adjusting the camera to ensure a better framing for the visual experience and organise when and how to adopt breakout room features and online activities to engage students. Besides course organisation, online teachers were suggested to have some mental preparations to set a professional and friendly tones to bring warmth and humanity, and to wear appropriate clothing to reduce distraction or to gain attention before staring the sessions. The synchronous online teaching practices under design and organization are presented in Table 2.

Table 2. Synchronous Online Teaching Practices under design and organization

No	Teaching Practices	Description	Number of studies mentioned	Authors, Years
1	Use of a webcam	Reinforce the use of a webcam; adjust teacher framing and projection in the webcam; do not insist on the use of a webcam	5	(Brown, Schroeder, & Eaton, 2016; Ng, 2020; Rehn, Maor, & McConney, 2018; Satar & Wigham, 2020; Sharp et al., 2021)
2	Set a professional and friendly tone to bring warmth and humanity.	Welcome all students when they arrive, and say thanks for participation, opening with a personal anecdote, laughing when technology glitches arise, and making references to unique moments from a previous class	4	(Conklin, Lowenthal, & Trespalacios, 2019; Goldsworthy & Verkuyl, 2021; Lakhal, Mukamurera, Bédard, Heilporn, & Chauret, 2020; Sharp et al., 2021)
3	Use of breakout room, classroom activities	Use breakout rooms for various activities, such as group discussions, problem-solving exercises, peer reviews, debates, etc.; circulate among breakout rooms to check in with the different groups	4	(Brown et al., 2016; Moorhouse & Kohnke, 2022; Palmer et al., 2022; Reinholz, Stone-Johnstone, White, Sianez Jr, & Shah, 2020)
4	Wear appropriate clothing	learners will see if the instructor had to stand up suddenly or move while on video	1	(Sharp et al., 2021)

There were four practices categorised under direct instruction. Educators were urged to incorporate non-verbal cues using onscreen emojis or hand signs, and adopt open and inclusive language to engage online students. Online teachers were suggested to avoid long, dull slide presentations and arrange timely short breaks to refresh the online learners, be patient to allow interruption, and adopt interactive instruction to make online classrooms a community. The synchronous teaching practices under direct instruction are presented in Table 3.

Table 3. Synchronous Online Teaching Practices under direct instruction

No	Teaching Practices	Description	Number of studies mentioned	Authors, Years
1	Incorporate non-verbal cues	Using smiles or onscreen emoticons to establish immediacy with learners; Establish a set of 'cues' to replace the non-verbal cues in a physical classroom.	4	(McArthur, 2022; Moorhouse, Li, & Walsh, 2021; Rehn et al., 2018; Satar & Wigham, 2020)
2	Allow interruption	Interrupt teacher talk to ask questions was not considered rude as the teacher could not see them.	1	(Moorhouse et al., 2021)
3	Student-centred and interactive instruction	Make the online classroom a community	1	(Xu, Zhou, Watts, & Kogut, 2023)
4	Arrange short and well-timed break	Refresh learners to combat "Zoom Fatigue"	1	(Sharp et al., 2021)

There were five practices categorised as facilitating discourse. Educators were encouraged to adopt unstructured, informal and chat-based interaction when interacting with students in synchronous online sessions. To encourage active participation, educators can amplify students' participation by frequently calling and repeating students' names to invite them to reflect on their experiences and opinions instead of waiting for a free-wheeling response. Meanwhile, to eliminate the dullness of virtual learning environment, online teachers were encouraged to use humour selectively when facilitating discourse. The synchronous online teaching practices under facilitate discourse are presented in Table 4.

Table 4. Synchronous Online Teaching Practices under facilitate discourse

No	Teaching Practices	Description	Number of studies mentioned	Authors, Years
1	Adopt unstructured, chat-based interaction	Use informal conversation to promote social interaction	6	(Alger & Eyckmans, 2022; Moorhouse & Kohnke, 2022; Moorhouse et al., 2021; Racheva, 2018; Reinholz et al., 2020; Sharp et al., 2021)
2	Encourage and amplify participation	Acknowledge students who contributed ideas	5	(Alger & Eyckmans, 2022; Ali, Narayan, & Sharma, 2020; Baker & Wick, 2020; Peck, 2021; Scull, Phillips, Sharma, & Garnier, 2020)
3	Use students' names.	Call students instead of waiting for the free-wheeling response	3	(Kelly & Westerman, 2016; Peck, 2021; Reinholz et al., 2020)
4	Creating a sense of humour	Jokes rely on timing, use humour selectively	3	(Hew, 2018; Pentaraki & Burkholder, 2017; Sharp et al., 2021)
5	Invite each student to comment.	Ask participants to reflect on their experiences, invite final thoughts and one critical take-home message	2	(Goldsworthy & Verkuyl, 2021; Sharp et al., 2021)

Population and Setting of the Study

This section presented the sample population and the background setting of the reviewed synchronous online teaching practices. These synchronous online teaching practices, including teaching profession development, were applied at university and higher education levels. Studies at K12 levels were scarce and limited. These teaching practices were adopted in different educational contexts and disciplines, such as pharmacy, nursing, medical, preservice teachers, teaching development, etc. The result of the population and setting of this study is presented in Table 5.

Table 5. Population and setting of the teaching practices

Teaching practices	Population and sample of the studies	Setting
1,2, 3, 7, 12, 11, 10	Undergraduate students, preservice teacher, teacher educator	Medical, nursing, pharmacy, linguistic, MOOCs learner, accounting, teaching profession development
12	Graduate students	Social science,
4, 5, 6, 9, 8	Teacher educator	Teaching profession development, online tutor

Most of the studies related to synchronous teaching practices were conducted in countries such as the USA, UK, Australia, China, etc. There were 34 studies found related to our research objectives; 56% of the studies were from the USA, 25% of the studies were from China, and 7% was from the UK. (See Figure 2).

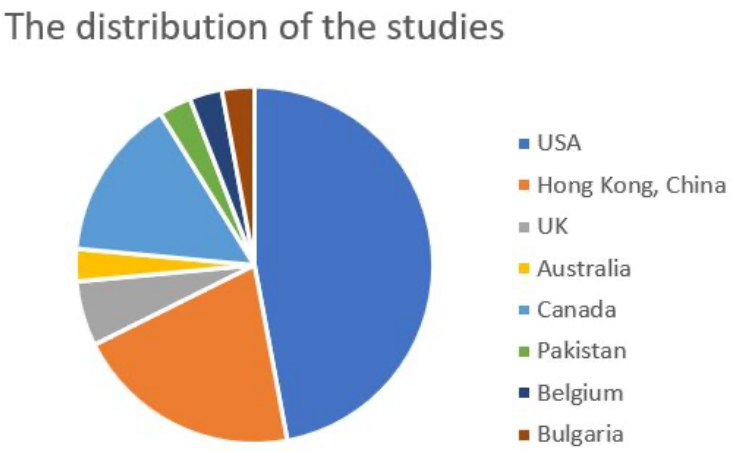

Figure 2. The distribution of the studies

Discussions

The objective of this scoping review was to summarize the synchronous teaching practices and their demography context in the literature for future advancement and evaluation. There were thirteen synchronous online teaching practices found. Four practices were categorised under design and organisation, four under direct instruction and five under facilitate discourse. Most of these practices were adopted at university or higher education levels, the study at K12 levels was none. The findings aligned with other studies where studies at K12 were rare and scarce (Borup, Chambers, & Stimson, 2019; Martin et al., 2021; Martin, Sun, & Westine, 2020). Since the needs and characteristics

were different between children and adults, the applicability and suitability of these practices on K12 levels needed more exploration. Most of these studies were conducted in the USA, UK and China. Cultural background can significantly affect perception, and the suitability of these practices on learners outside the USA, UK, and China needs to be delved into to find the most appropriate teaching practices that suit the learners.

The study's findings presented the roles of an online instructor in synchronous online sessions. The instructor managed different roles simultaneously, including instructional, managerial, technical, communication, and social (Grammens et al., 2022). Previous research has indicated that the teachers' behaviour plays a crucial role in implementing evidence-based practices to optimise student engagement. (Harbour, Evanovich, Sweigart, & Hughes, 2015). It involved demonstrating desired academic and social behaviours, offering opportunities for students to engage with curricular content, and providing both academic and behavioural feedback. Teaching online requires specific skills (Barbour, 2018; Grammens et al., 2022). The study's findings served as a direction for online teachers to maximize their flexibility, adaptability, capability, and creativity in future synchronous online teaching.

Previous studies indicate that the teaching practices that work well on adult learners may not necessarily work on learners at other levels (DiPietro, Ferdig, Black, & Preston, 2008). This is aligned with the findings where studies at the undergraduate level suggested reinforcing the use of the webcam. Meanwhile, studies at higher levels suggested not insisting on the use of the webcam. As part of effective and productive online learning, synchronous online sessions must to be carefully designed based on the needs and characteristics of the learners.

Among these practices, some were easy and some were difficult. For example, creating a sense of humour when facilitating discourse to create a dynamic virtual learning environment. This practice could be the most challenging in synchronous online sessions. A synchronous online session is a form of real-time communication. Even a stage comedian needs a storyline beforehand; producing interesting, engaging, humorous, but not vulgar online content tests every teacher's communication, content, technology and pedagogy ability.

Although these studies provided an overview of teaching practices in synchronous online sessions, they need more details on implementation. For example, creating a sense of humour. How to joke? What to joke? The implementation details were crucial for educators new to the field. Besides, most practices mentioned practices that make things better. Besides, none of the practices mentioned how to deal with mischievous behaviour or purposeful distraction. As synchronous online sessions are real-time communication, it will be helpful for inexperienced instructors if there are some conflict management practices.

Conclusion

The review highlighted the teaching practices employed in synchronous online learning from 2015 to 2023. Thirteen synchronous online teaching practices were found in the study. These practices were categorised into design categories: organization, direct instruction, and facilitated discourse. Most of the studies focused on students at higher levels. The studies of teaching practices at elementary levels were limited. Most of the studies were conducted in the USA, UK and China. The applicability and suitability of these practices in countries other than the USA, UK, and China need exploration.

Limitations and Future Studies

This scoping study offered a detailed description of the research findings and scope within specific areas of study. It also served as a valuable mechanism to summarize and communicate research outcomes to policymakers, practitioners, and teachers who may need more time or resources to conduct such comprehensive assessments independently. Nevertheless, it is essential to acknowledge that a scoping study's identification of gaps in the literature may not necessarily highlight research gaps caused by poor-quality studies, as assessing the research's quality is outside the scope of the scoping study's objectives. There were a few suggestions for future studies on this topic, such as the feasibility and suitability of these practices on K12 learners and the details of implementation of these practices.

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