International Journal of Adult Education and Technology
Volume 14 • Issue 1

Blended Instructional Strategies Based on Community of Inquiry Framework:
A Systematic Review of the Literature

Xiaoyu Wang, Universiti Teknologi Malaysia, Malaysia*
https://orcid.org/0009-0000-5942-9758

Nurhasmiza Sazalli, Universiti Teknologi Malaysia, Malaysia

Wan Nur Asyura Wan Adnan, Universiti Teknologi Malaysia, Malaysia
https://orcid.org/0000-0002-2332-6703

ABSTRACT

In this study, 210 articles were reviewed from two databases—Web of Science and Scopus—using the systematic literature review method, following the PRISMA (preferred reporting items for systematic reviews and meta-analyses) selection and analysis process. Through systematic literature review and statistical analysis of empirical research articles, this study takes the community of inquiry (CoI) framework as theoretical support, tries to clarify blended learning instructional design methods based on the CoI framework based on understanding the thematic distribution of the existing literature, and provides a deeper understanding of the application of the CoI framework in the blended classroom. Hence, blended instructional design can be approached from the perspective of both teachers and learners. Students' personalized learning, collaborative learning, peer interaction, and student engagement are targeted to be strengthened. Teachers, on the other hand, should consider teacher-student interactions, teacher roles, instructional materials and environments, and mobile learning.

KEYWORDS

Blended Learning, Community of Inquiry (CoI) Framework, Instructional Design, PRISMA, Systematic Literature Review

1. INTRODUCTION

1.1 Research Background

Due to the COVID-19 epidemic, online/distance learning is growing rapidly around the world. With the stabilization of the epidemic, teaching and learning in the post-epidemic era can never go back and should not return to the old way of education (Zhao & Wang, 2020). Blended learning has become the best choice to follow the trend of the times and meet the learning needs of students. The general blended instructional design for college teachers lacks guidance on relevant pedagogy to

DOI: 10.4018/IJAET.332812 *Corresponding Author

accommodate the different blended instructional environments. Realizing the importance of teaching models, educators and researchers have begun to explore the role and impact of different teaching models in guiding and building a comprehensive view of blended learning.

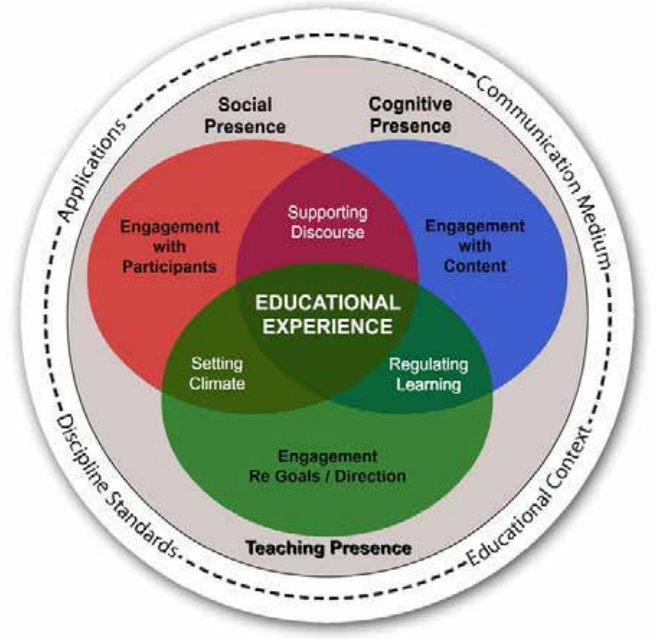
Various teaching and learning models have gradually captured the limelight in the long history of blended learning development. The community of inquiry (CoI) framework, one of the online and blended learning models, was created by Canadian scholars Garrison et al. (2001) to create an environment in which teachers and students could perceive the presence of learning in online or blended settings. They developed the concept of presence, a psychological representation of being present and connected (Greene, 1973; Tremmel, 1993), into a blended learning community constructed by the triad of cognitive presence, teaching presence, and social presence to facilitate active student inquiry, the community of inquiry. It is important to note that the CoI model has been identified as one of the most widely used frameworks in online teaching and learning (Castellanos-Reyes, 2020).

There are an increasing number of articles exploring the characteristics and strategies of teaching and learning in blended learning environments using the CoI framework as the theoretical basis. The CoI framework has become a well-established theory for guiding blended learning. The purpose of this study is to review the existing literature on the CoI framework in blended learning, to elucidate the strategies and methods of blended instructional design based on the CoI framework, and to attempt to form some guidelines for blended instructional design that can be used as a reference for future educators.

1.2 Research Gap

Since Garrison et al. (2001) proposed the community of inquiry framework (Figure 1) in online learning environments, scholars have been interested in the CoI framework and its impact on online learning and have studied it from several perspectives (Rourke & Kanuka, 2009; Annand, 2011). Although many studies are focusing on the use of CoI in online learning and its impact on the teaching and

Figure 1. Community of Inquiry Framework



learning process, few scholars have systematically reviewed the existing research. The importance of systematically reviewing past studies is unquestionable. However, traditional literature reviews are prone to reviewer bias, are seldom comprehensive, and rarely consider different research quality levels, according to Robinson and Lowe (2015). This study attempts to provide a systematic literature review of the community of inquiry framework's instructional strategies in blended learning course design. According to Rudnicka et al. (2012), the systematic literature review method refers to an explicit and systematic method of reviewing relevant literature, using clear and reproducible search techniques and retrieval strategies to search and evaluate relevant literature. It is necessary to screen and filter literature based on the research question or predefined criteria in order to accurately understand the current state of research and development trends of the research topic. In addition, Drahota et al. (2016) describe systematic literature review (SLR) as a process of categorizing, selecting, and critically evaluating previous studies. Protocols or plans are specified before the review process in SLR. It consists of a systematic search over several databases that other researchers can replicate and reproduce. Although the community of inquiry framework was initially designed for online learning environments, with the development of education and teaching, blended learning has become the optimal learning mode for most educational stages, and CoI in blended learning has been increasingly studied.

Clarifying instructional strategies based on the CoI framework in blended learning is urgently needed by English as a Foreign Language (EFL) teachers. This researcher is filling this gap by systematically reviewing previous related studies to better understand the characteristics of blended instructional design in a CoI environment. The blended learning environment was chosen for several reasons. First, blended learning uses a wide area. After the COVID-19 epidemic, most educational institutions around the world developed complete online courses and online learning platforms, allowing the necessary infrastructure for blended learning. Second, there is a lack of guidance on blended instructional design. Although most educational institutions have adopted blended learning in the post-epidemic era, there is a lack of guidance on blended instructional design due to teachers' lack of updated pedagogical knowledge and information literacy (Wang et al., 2023; Gurley, 2018). Therefore, it is instructive to clarify the instructional strategies guided by the CoI framework through a systematic literature review. This study provides contributions to practice and the body of knowledge. By referring to this study, interested populations, such as blended learning teachers, administrators, and educational technologists, can now understand the increasing need to incorporate pedagogical knowledge into instructional design in response to environmental and other forms of change. Furthermore, it provided specific information on the areas and content of research that should be the focus of researchers.

2. METHODOLOGY

A systematic literature review method was used to conduct this study. By using clear and reproducible search techniques and search strategies, the relevant literature is searched and evaluated in the systematic literature review method. Following the screening and selection of relevant literature, the research question and predefined criteria are used to determine the status and trends in the field of research on the research topic to answer the specific research question (Rudnicka et al., 2012). It is rigorous and transparent, and provides clear research questions, comprehensive search strategies, well-defined literature criteria, qualified evaluation methods, comprehensive data analysis, and reliable research results. In contrast to traditional research methods, which are subject to subjectivity and bias, systematic literature reviews can effectively overcome these problems (Sutherland, 2004).

2.1 Formulation of Research Question

The research questions in this study were developed using PICO (Population, Interest or Interventions, Context and Outcomes), an objective tool for formulating appropriate research questions for literature reviews. PICO focuses on three main concepts: population or problem, interest, and context.

Accordingly, the authors identified three key areas for inclusion in their review: university students as the target population, instructional strategies as the area of interest, and blended learning as the context. The resulting structure of the review reflects these three aspects. The research question presents itself within the context of PICO: What are the key instructional strategies of blended learning courses based on the community of inquiry framework?

2.2 The Review Protocol-PRISMA

This study followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA) approach to literature review. A commonly used method of systematic review is PRISMA, which contains 27 indicators (e.g., title, abstract, methods, results, discussion, etc.) and four stages (Liberati et al., 2009). Moreover, it is essential to clearly describe how and why the literature was identified, screened, included, or excluded (identification, screening, eligibility, inclusion) to improve the precision of systematic reviews and meta-analyses.

Based on this research idea, this study finally obtained 31 eligible papers, including five papers indexed by the Web of Science database, seven papers indexed by the Scopus database, and 19 papers dual indexed by WOS and Scopus. The PRISMA flow chart is shown in Figure 2. For the screened 31 papers, the study coded and analyzed them in the dimensions of author, year, country, journal, research topic, index system, research context, research object, research period, research method, measurement method, measurement tool, and research conclusion.

2.3 Systematic Searching Strategies

2.3.1 Identification

To effectively obtain studies of high-quality empirical literature from the community of inquiry framework, two databases, Web of Science and Scopus, were selected for this study, and an exact search of article titles and abstracts was conducted with the keywords community of inquiry or CoI, and the literature was limited to the period from 2013 to 2023, and a total of 210 articles were obtained. For the Web of Science database, the search formula was TS= ((“community of inquiry*” OR “CoI*”) AND (“blended learning*” OR “mixed learning” OR “mobile learning” OR “flipped class*”) AND (“design*” OR “class design” OR “instructional design” OR “teaching plan” OR “teaching design”)), and 82 articles were retrieved between 2006 and 2023. For the Scopus database, the search formula was TITLE-ABS-KEY ((“community of inquiry*” OR “CoI*”) AND (“blended learning*” OR “mixed learning” OR “mobile learning” OR “flipped class*”) AND (“design*” OR “class design” OR “instructional design” OR “teaching plan” OR “teaching design”)), and 128 results were found between 2006 and 2023.

2.3.2 Screening

For the purpose of ensuring the accuracy and reliability of the literature analysis results as well as accurately presenting the empirical research conducted in the community of inquiry framework around the world, Table 2 (Indriasari et al., 2020) outlines the criteria for identifying and excluding the 210 documents initially retrieved based on the research questions. Systematic literature reviews commonly utilize criteria 1-5 to ensure the sample is accurate and authoritative. In accordance with Criterion 6, empirical studies that lack a rigorous experimental design, clear research methods, and a clear research question are screened. Criterion 7 is designed to focus the research theme of the literature on blended instructional design based on the community of inquiry framework and to exclude research literature that uses the community of inquiry framework as a single variable or non-research focus. Criterion 8 seeks to focus the research setting of the literature on the undergraduate level and excludes the research literature at other levels of study.

Figure 2. PRISMA Flow Chart

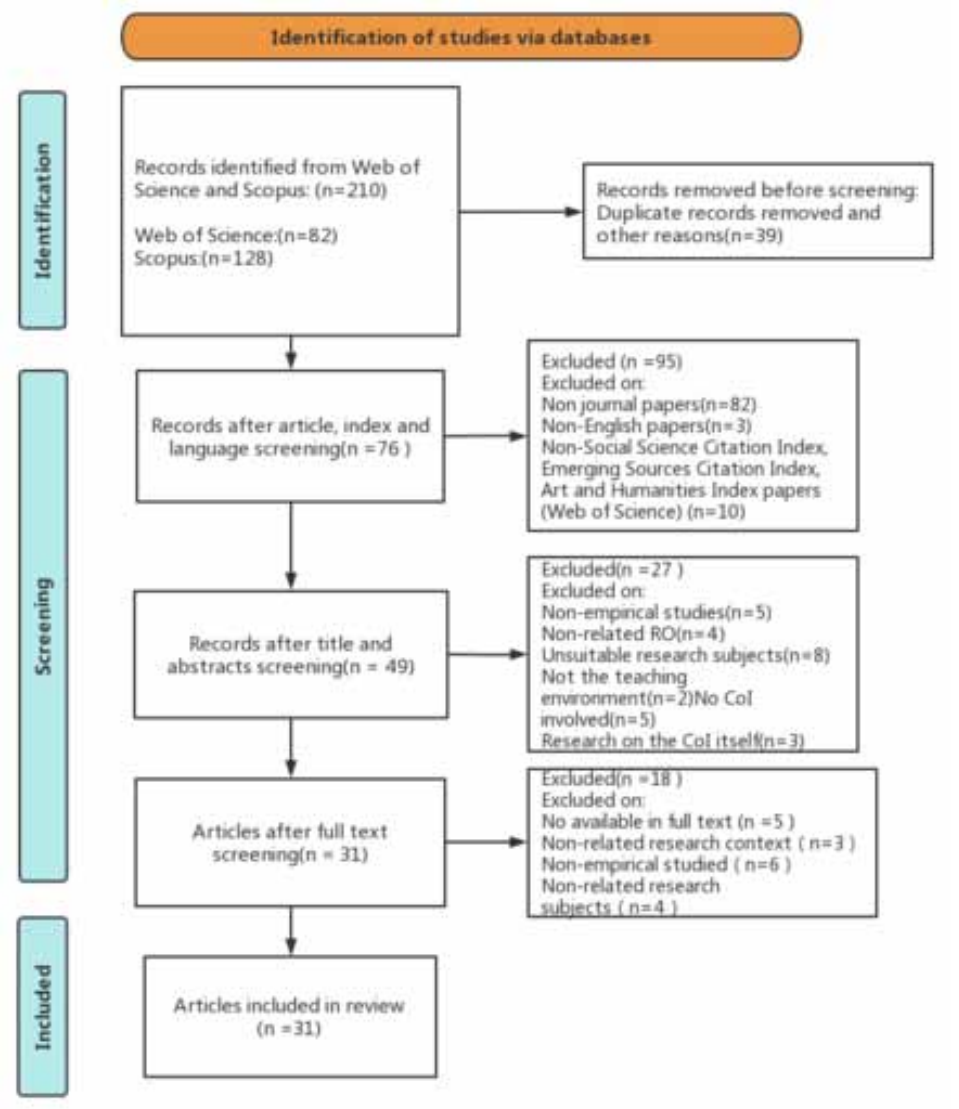


Table 1. The Search String Used for the Systematic Review Process

Database	Search String
Web of Science	TS= ((“community of inquiry*” OR “CoI*”) AND (“blended learning*” OR “mixed learning” OR “mobile learning” OR “flipped class*”) AND (“design*” OR “class design” OR “instructional design” OR “teaching plan” OR “teaching design”))
Scopus	TITLE-ABS-KEY ((“community of inquiry*” OR “CoI*”) AND (“blended learning*” OR “mixed learning” OR “mobile learning” OR “flipped class*”) AND (“design*” OR “class design” OR “instructional design” OR “teaching plan” OR “teaching design”))

Table 2. Literature Selection Criteria

No.	Inclusion Criteria	Exclusion Criteria
1	English Papers	Non-English papers
2	Empirical Studies	Non-Empirical Research
3	Full text available	Full text not available
4	The article is a journal article	Book manuscripts, conference papers, reports, etc.
5	The article contains at least three pages	Posters, short papers, or briefs of less than three pages, etc.
6	The study includes a clear research question, research methods, and research findings	The study does not present a clear research question, research methodology, or research findings
7	The article focuses on blended instructional design within the community of inquiry framework	The article uses the community of inquiry framework as a single variable or non-research focus
8	Research setting on the undergraduate level of study	Research literature at other levels of study.

2.3.3 Eligibility

Third, the authors conducted a manual review of the retrieved articles to ensure that all remaining articles (after screening) met the requirements. This process was accomplished by reading the titles and abstracts of the articles.

This process excluded 179 articles due to their focus on a purely online learning environment, focus on modifications to the CoI framework itself, focus on reviews rather than empirical data, lack of specific research methodology and conclusions, and publication in the form of book chapters. In general, only 31 articles were selected.

2.4 Data Abstraction and Analysis

The analysis and assessment of the remaining articles were conducted. A focus was placed on studies that addressed the formulated questions. A thorough reading of the abstracts was conducted first, followed by a thorough reading of the full articles (in-depth) in order to identify appropriate themes and sub-themes. Key features of blended instructional strategies based on the CoI framework were qualitatively analyzed using thematic analysis.

Using qualitative or mixed-methods techniques allows the researcher to compare primary data sources iteratively while synthesizing or analyzing synthesized data, according to Whitmore and Knafl (2005). For this study, a qualitative method was chosen. The authors thoroughly read the abstracts, results, and discussion sections of all 31 articles. In the subsequent process of thematic analysis, themes and sub-themes were identified as a result of attentional patterns and themes identified through clustering, counting, and noting similarities and relationships between abstracted data (Braun & Clarke, 2006). Braun and Clarke (2006) define thematic analysis as discovering, interpreting, and reporting patterns in data. Grouping large data sets into broad themes makes it possible to easily interpret them.

The coding method used by the authors in the thematic analysis was deductive, so the first step in the thematic analysis was to generate themes. In this process, the authors summarized all the screened literature abstracts into an Excel spreadsheet and imported it into the Nvivo software for categorization and analysis; similar and relevant abstracts were grouped together into four main clusters (teacher-student training, student perceptions, interactive supervision, and teaching and learning environments). Subsequently, the authors re-examined these four groups, found some duplication in content, and decided to group the articles in terms of both teacher and student activities, so the two main themes were identified as student learning activities and teacher instructional activities. The authors then summarized all the articles in terms of their research objectives and methods, findings were read

and compared repeatedly, and eight additional sub-themes were identified under the guidance of the two major themes (see Figure 3). The next process was to review these themes for accuracy, and the authors re-examined all of the generated major thems and sub-themes by reading all of the papers to ensure that they were useful and accurately represented for the articles. Although thematic analysis is a subjective process, failure to carefully weigh various factors can lead to the loss of important details. Therefore, all three authors, who are experts in qualitative methods and teaching, were involved in the discussion and development of the main themes and sub-themes throughout the process.

3. RESULTS

3.1 Basic Information on Reviewed Articles

The authors did an analysis of 31 articles selected for basic information. The distribution of these publications peaked in 2023, with six articles published as of September. This is followed by the year 2019 with five articles and 2018, 2021, and 2022 with four articles each, as shown in Figure 4.

Figure 3. Themes and Sub-themes in Nvivo Mind Map

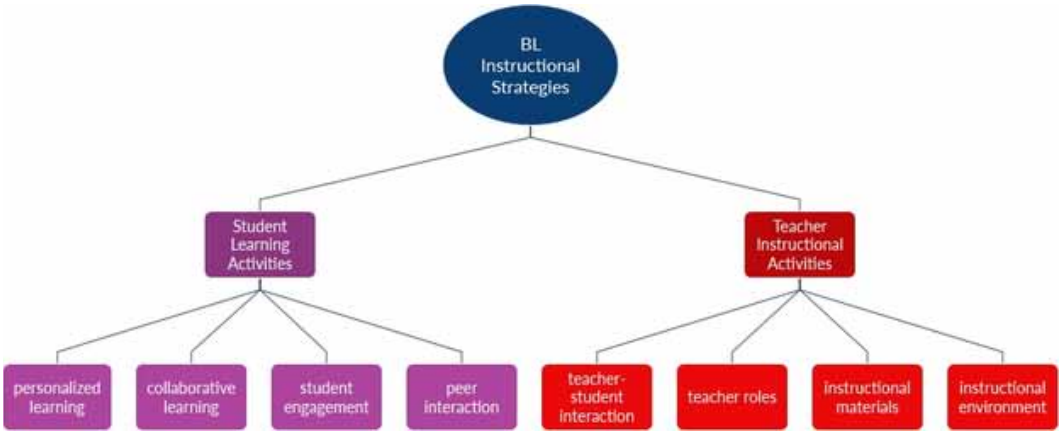
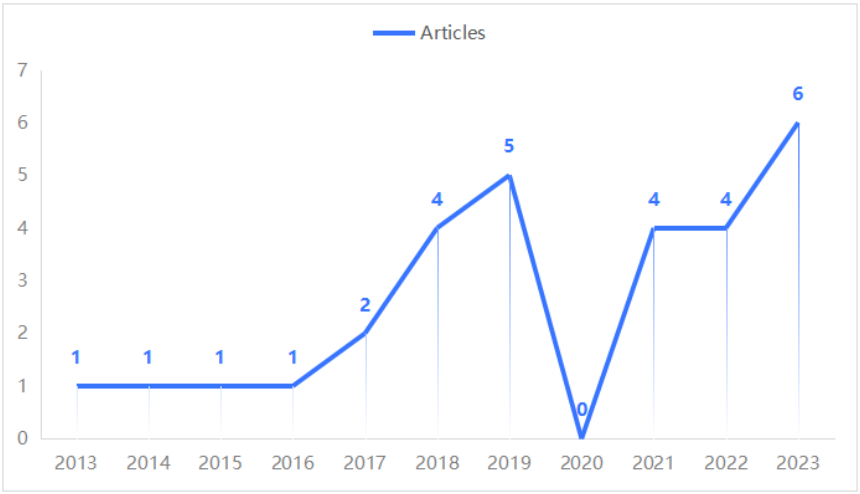


Figure 4. Year and Number of Articles Published



Next, the VOS Viewer 1.6.18 software was used to generate keyword co-occurrence maps. The software was set up to count co-occurrences, full counts, and a minimum of three occurrences. Twenty-eight keywords were selected visually. Based on the network mapping shown in Figure 5, terms are clustered in three main groups, and colored lines indicate co-occurrences.

Clusters related to instructional approaches (red) contain keywords: "blended learning" and "community of inquiry"; clusters related to human learning experimentation (green) with keywords such as "human experiment" and "controlled study." Clusters related to the subject of the study (blue) have keywords such as "adult" and "female."

Although they are categorized into different clusters, most of the keywords fit and represent all the core components of Col-based blended learning.

3.1.1 Publication and Citation of Literature

In terms of publication time, the current empirical research on blended learning design with CoI shows an overall trend of increasing year by year (see Figure 2), indicating that blended learning design with CoI continues to be and is being paid attention to by researchers around the world in an upward trend. In terms of the distribution of published journals, 31 articles were published in 27 different journals, of which 24 (77.4%) were published in education journals, 3 (9.7%) in humanities and social sciences journals, 3 (9.7%) in medical journals, and the remaining 1 (3.2%) in interdisciplinary journals. The top four journals in terms of number of publications were *Turkish Online Journal of Distance Education, Internet and Higher Education, Nursing Open,* and *International Journal of Emerging Technologies in Learning* (Table 3).

There are 10 publications with more than 20 citations and four articles with more than 50 citations as measured by the citation rate. According to the citations, Kim et al.'s (2014) study of flipped classrooms in an urban university attracted the most citations (535), followed by Szeto's (2016) study of three CoI presences in a blended synchronous learning and teaching environment (179).

Figure 5. Keywords Co-occurrence Chart for Filtered Articles

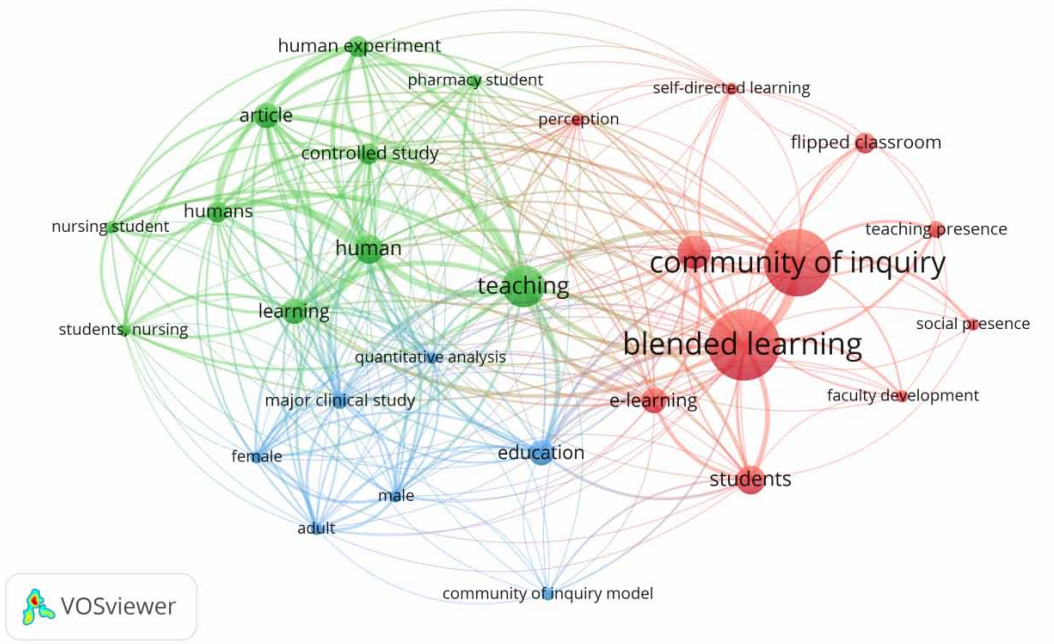


Table 3. Distribution of Reviewed Studies Based on Journal References

Journal reference	Number	Study(N=32)
Turkish Online Journal of Distance Education	2	(Mese & Dursun, 2019; Karaoglan-yilmaz et al., 2023)
Internet and Higher Education	2	(Kim et al., 2014; Wicks et al., 2015)
Nursing Open	2	(Liu et al., 2021; Wang et al., 2023)
International Journal of Emerging Technologies in Learning	2	(Man et al., 2019; Chuah & Kabilan, 2021)
Behavior and Information Technology	1	(Ateş Çobanoğlu, 2018)
CALL-EJ	1	(Bailey & Almusharraf, 2021)
Education and Information Technologies	1	(Bamoallem & Altarteer, 2022)
International Journal of Learning, Teaching, and Educational Research	1	(Bosch & Laubscher, 2022)
IEEE Transactions on Education	1	(Cabrera et al., 2017)
Educational Technology and Society	1	(Chen & Chang, 2017)
BMC Medical Education	1	(Cornelison & Zerr, 2023)
Journal of Computers in Education	1	(ElSayad, 2023)
Online Learning Journal	1	(Gurley, 2018)
Issues in Educational Research	1	(Hains-Wesson & Tytler, 2015)
International Journal of Information and Learning Technology	1	(Huang & Lee, 2022)
Theory and Practice in Language Studies	1	(Huynh & Nguyen, 2019)
International Journal of Educational Technology in Higher Education	1	(le Roux & Nagel, 2018)
Education and Training	1	(Lindorff & McKeown, 2013)
Social Sciences and Humanities Open	1	(Morrison & Jacobsen, 2023)
International Journal of Pharmacy Practice	1	(Nazar et al., 2019)
International Journal of Mathematical Education in Science and Technology	1	(Padayachee & Campbell, 2022)
Innovations in Education and Teaching International	1	(Paskevicius & Bortolin, 2016)
Computer Assisted Language Learning	1	(Rubio et al., 2018)
Journal of Clinical Nursing	1	(Siah et al., 2021)
International Journal of Instruction	1	(Solimani et al., 2019)
Pharmacy Education	1	(Sonji et al., 2023)
Turkish Online Journal of Educational Technology	1	(Szeto, 2016)

3.1.2 Characteristics of the Study Design

In order to further analyze the blended learning design with the CoI framework empirical research context and the experimental design, this study systematically analyzed the disciplinary background, research object, sample size, and research methodology of the selected literature. The analysis of disciplinary background reveals that in the past ten years, the empirical research on blended learning

design with CoI has not only been distributed in the field of education but also in medical science and computer science, etc. Researchers have also paid attention to the CoI blended learning framework. Among them, researchers in education and medicine pay the most attention to blended learning design with CoI empirical evidence, and research cases are relatively rich.

In terms of the category of research subjects, because the screening criteria for this review had filtered out literature from non-college research backgrounds, blended learning design with CoI empirical studies had 74.2% (n = 23) of undergraduate students as research subjects, 22.6% (n = 7) of university teachers as research subjects, and other (online participation data) as research subjects were 3.2% (n = 1).

In terms of sample size, 25.8% (n = 8) of the blended learning design with CoI empirical studies had a sample size of less than 40 students, 22.6% (n = 7) had a sample size of more than 200 students, and the sample sizes of the other studies were relatively evenly distributed. This indicates that the sample size of the empirical studies of blended learning design with CoI is mainly controlled at about one class, which facilitates the research design and the control of relevant variables and, at the same time, avoids the research limitations caused by too small a sample size. However, there are some studies with a sample size of more than 200 students, which are basically longitudinal follow-up studies for large groups of students.

To better utilize the blended learning design with the CoI empirical research paradigm, in terms of data collection and analysis methods, a mixed research method combining quantitative and qualitative research methods was used in 45.2% (n = 14) of the studies, with 35.5% of quantitative studies (n = 11) and 19.4% of qualitative studies (n = 6). In general, most of the studies used mixed research methods (n = 14, 45.2%) and quantitative research (n = 11, 35.5%)

3.2 The Themes and the Sub-Themes

3.2.1 Features of Student Learning Activities

Blended learning utilizes technological tools and online platforms that allow students to learn independently at different times and places and to have a more personalized, flexible, and diverse educational experience. The theme of blended instructional design features based on student learning activities can be divided into four sub-themes: personalized learning, collaborative learning, peer interaction, and student engagement (Table 4).

First, personalized learning is the first sub-theme under student learning activities. Personalized learning can better meet the students' own interests and abilities. It can also be more effective in promoting the holistic development of each student. By understanding and focusing on each student's unique needs and providing them with appropriate resources and coaching, we can help them achieve balanced cognitive, emotional, social, and other aspects of development. Elson Szeto (2016) suggested that providing students with feedback based on the learning process can help to improve their sense of community of inquiry, teaching presence, social presence, and cognitive presence. In order to adjust the implementation of online activities, Man et al. (2019) argued that instructors must analyze each student's behavioral characteristics during blended learning. The study by Bamoallem and Altarteer (2022) combined two modified blended learning models and suggested that continuous and targeted feedback during operation is one of the measures to ensure blended learning effectiveness. Nazar et al. (2019) also argued that investigating student learning preferences helps to provide effective educational interventions. Morrison and Jacobsen (2023) found that students perceive teaching as a result of receiving timely, strengths-based, and personal feedback. It is important that students receive regular feedback on their work so that they know whether their work is being reviewed and whether they are on the right track.

The second sub-theme of this theme is collaborative learning. Collaborative learning is also the most preferred form of classroom activity according to student feedback, as well as an important design concept of blended learning activities that promotes the establishment and development of the three types of presence in the CoI framework. Bosch and Laubscher (2022) identified collaborative learning

as an effective strategy for promoting self-directed learning as a learning presence and suggested guidelines for teachers (active participation of the instructor, the benefits of sharing responsibility and success, and the fact that students enjoy group tasks). Padayachee and Campbell (2022) also suggested design principles for teachers' instructional strategies to adapt CoI to online discussion forums where math students collaborate. Rubio et al. (2018) revealed that teachers had more facilitative behaviors and a more meaning-oriented instructional orientation that relied more on collaboration, again demonstrating the importance of sustained student engagement and collaborative learning for blended learning design. Cabrera et al. (2017) redesigned the community of inquiry-based learning framework using an online community and a team-based learning (TBL) design model.

The third sub-theme of blended instructional strategies based on student learning activities is student engagement enhancement. Extensive studies have shown that student engagement is closely related to students' academic achievement, learning satisfaction, etc.. In this review, seven articles also identified student engagement as an important instructional measure of blended learning based on the CoI framework. Hains-Wesson and Tytler (2015), in exploring which understandings in designing blended instruction influenced the process of refining a blended learning model, emphasized the importance of student engagement when they argued that new ways must be found to engage the disengaged. The findings of both Morrison and Jacobsen (2023) and Rubio et al. (2018) showed that sustained engagement proved to be the strongest variable in predicting success in the course, which also implies more facilitative behaviors from teachers and a pedagogical direction that focuses more on cognitive development. The study by Cabrera et al. (2017), on the other hand, utilized a blended learning model that integrates CoI and team-based learning to enhance student engagement.

The last sub-theme of this theme is peer interaction. Here the behavior of interaction throughout blended learning is divided by the authors into teacher-student and peer interaction. In the process of discussion and communication, they can share their views, experiences, and ways of thinking, thus broadening their knowledge and understanding of the problem. At the same time, peers were able to inspire, motivate, and help each other to improve their learning by working together. Chuah and Kabilan (2021) utilized chatbots to simulate an interactive cycle for students to practice the target language, which ultimately created an active environment for the students. Bamoallem and Altarteer (2022) also mentioned interaction and discussion as the most preferred and engaging form of teaching and learning activities for university students in their pedagogical advice to teachers. Nazar et al. (2019) developed a series of effective educational interventions by investigating the learning preferences of students, which included online peer interactions. In a study by Huang and Lee (2022), it was also argued that interactive techniques should focus on improving peer-to-peer interactions.

3.2.2 Features of Teacher Instructional Activities

For teachers and educators, blended instructional design based on the community of inquiry framework presents a significant challenge. Since there are no instructional design principles or guidelines that teachers can refer to in the blended learning process, most of the literature in this review has implications for research. Within the theme of features of teacher instructional activities, there are four sub-themes: teacher-student interactions, teacher roles, instructional materials, and instructional environment (Table 4).

The community of inquiry framework has been continuously argued and explored by scholars since it was proposed. One of the most discussed issues in blended instructional design is teaching presence. The first sub-theme of instructional design from teacher instructional activities is teacher-student interaction, which is an important characterization of teaching presence. Lindorff and McKeown (2013) found that students preferred interactive tutoring. Paskevicius and Bortolin (2015) focused on forums in the Learning Management System (LMS), using the instructor as a subject of the study, and found that learning occurs through building and sustaining interactions in a community of learners. Padayachee and Campbell (2022) focused on online discussion forums that provide faculty-student interactions and proposed 14 design principles for online discussion forums. Bailey

Table 4. The Themes and the Sub-themes

Author	Student Learning Activities				Teacher Instructional Activities			
	PL	CL	PI	SE	T-SI	TR	IM	IE
Mese & Dursun (2019)								/
Karaoglan-yilmaz et al.(2023)	/			/				
Kim et al.(2014)			/					
Wicks et al.(2015)								/
Liu et al. (2021)		/						
Wang et al.(2023)		/				/		
Man et al.(2019)	/			/				
Chuah & Kabilan(2021)			/					/
Ateş Çobanoğlu(2018)			/		/			/
Bailey & Almusharraf(2021)					/	/		/
Bamoallem & Altarteer(2022)	/		/		/	/		
Bosch & Laubscher(2022)	/	/				/		
Cabrera et al.(2017)		/		/				
Chen & Chang(2017)							/	
Cornelison & Zerr(2023)							/	
ElSayad(2023)								/
Gurley(2018)						/		
Hains-Wesson & Tytler(2015)				/		/		
Huang & Lee(2022)		/	/		/			
Huynh & Nguyen(2019)			/					/
le Roux & Nagel(2018)	/	/		/			/	
Lindorff & McKeown(2013)					/		/	
Morrison & Jacobsen(2023)	/			/				
Nazar et al.(2019)	/		/		/	/		/
Padayachee & Campbell(2022)	/				/			
Paskevicius & Bortolin(2016)					/		/	
Rubio et al.(2018)				/				
Siah et al.(2021)	/	/						
Solimani et al.(2019)								/
Sonji et al.(2023)				/				/
Szeto(2016)	/				/			

PF=Personalized Learning
CL=Collaborative Learning
PI=Peer Interaction
SE=Student Engagement
T-SI=Teacher-Student Interaction
TR=Teacher Roles
IM=Instructional Materials
IE=Instructional Environment

and Almusharraf (2021) argued that teachers should creatively intervene in online discussions by facilitating and encouraging students to comment, seeking elaboration of ideas, facilitating positive interactions in online discussions, and promoting the use of meaningful language games to develop interaction and knowledge construction.

The second sub-theme of instructional design features from teacher instructional activity is the teacher's multiple roles. Teachers in blended learning are not only guides and mentors in the student learning process, but also act as technology mediators and tool users. Hains-Wesson and Tytler (2015) argued that educators need to have professional backgrounds that are adapted to the times. Gurley (2018) also emphasized the need for training and development programs for teachers' professional skills. The empirical study of CoI by Wang et al. (2023) also proved that teachers play the role of supervisor, facilitator, and coordinator in facilitating learning. Bosch and Laubscher (2022) noted the importance of active participation and discourse facilitation of lecturers in their guiding recommendations for teachers.

The third sub-theme under this theme is reasonable instructional materials. The selection and integration of instructional materials determine the interest of students in learning. Lindorff and McKeown (2013) found that students primarily accessed online materials they found most useful for improving their grades and preferred online materials related to assessment results over materials designed to deepen understanding. Le Roux and Nagel (2018) used instructional video recordings in advance to integrate instructional resources and instructional priorities followed by instructor assistance to increase student engagement in learning. However, Cornelison and Zerr (2023) found a statistically significant difference between the experimental and control cohorts in terms of total test scores, with the on-campus class cohort scoring slightly higher than the online class cohort.

The last sub-theme under this theme is an interesting instructional environment. Nazar et al. (2019) suggested that small class sizes help maximize instructional resource use. Wicks et al. (2015), on the other hand, through a study of faculty learning communities, found that faculty learning communities are a useful form of professional development. Teachers who struggle with blended courses can receive advice and encouragement from their peers about promising practices. Sonji et al. (2023) also stated that a safe classroom learning climate contributes to student engagement and cognitive development. ElSayad (2023) suggested the importance of establishing a CoI framework in a blended learning environment by investigating the potential impact of the components of a community framework of inquiry on students' perceptions of learning. Research on the integration of mobile applications into blended learning environments is also represented in this sub-theme. Chuah and Kabilan (2021) learned about the effects of chatbots (mobile apps) on students' social presence and interactive behaviors from a teacher's point of view. Huynh and Nguyen (2019) investigated students' perceptions of blended learning and mobile apps and provided teachers with suggestions to incorporate mobile apps into blended EFL classrooms. Bailey and Almusharraf (2021) asked teachers to adopt Facebook for interaction in their study and received positive responses. However, the study on gamified instructional design conducted by Mese and Dursun (2019) found that academic achievement, motivation, and the community of inquiry model did not differ between groups.

3.3 Blended Instructional Guidelines Based on CoI Framework

With the analysis of the selected literature, the authors generalized seven blended instructional guidelines based on the community of inquiry framework.

First, it is important to ensure that the CoI framework is well established and students are engaged in blended instruction. Bamoallem and Altarteer (2022) found that teaching cognitive and social presences was a predictor of students' perception and acceptance of blended learning. There was also a positive moderate relationship between academic self-efficacy and the CoI framework (Karaoglan-Yilmaz, 2023). Numerous studies have shown that student engagement is closely related to students' academic achievement, learning satisfaction, etc., and it is also considered an important

measure of blended instruction based on the CoI framework (Hains-Wesson and Tytler, 2015; Morrison & Jacobsen, 2023; Rubio et al., 2018; Cabrera et al., 2017).

Second, blended instruction should be designed to enhance students' collaborative learning. Bosch and Laubscher (2022) found that collaborative learning in blended courses enhanced self-directed learning by allowing students to manage their own learning, providing enjoyable experiences, and offering encouraging feedback. Developing collaborative guidelines for classroom and online discussions helps create and maintain a supportive learning environment with a higher level of trust and a sense of group belonging (Wang et.al., 2023). Collaborative seminar learning also improves students' learning comprehension and promotes deeper learning (Le Roux, 2018; Cabrera et al., 2017). Online collaborative group learning, including online forums, online learning communities, etc., leads to collaborative knowledge construction through student-teacher and student-student debates and discussions (Nazar et al., 2019; Huynh & Nguyen, 2019). However, members of collaborative groups need to be relatively fixed to ensure a safe and stable learning atmosphere (Cornelison & Zerr, 2023).

Third, more platforms for teacher-student and student-student interactions should be designed using technology. Due to the time constraints of face-to-face interactions, more discussions and interactions should happen online with the help of technology. Huang and Lee (2022) found that first-year college student respondents perceived media to be slightly more efficient for communication in blended learning (Shea & Bidjerano, 2008). A community of learners establishes an atmosphere that supports open communication, trust, and a safe environment in which the use of online discussion forums contributes to increased social presence, cognitive presence, and teaching presence, which in turn improves student learning outcomes (Padayachee & Campbell, 2022; Paskevicius & Bortolin, 2016; Cabrera et al., 2017). Notably, interactive software such as Chatbot or chat-gpt is useful in language teaching to provide students with feedback and simulate the interactive cycle of language practice, as well as to enhance social presence in the learning environment (Chuah & Kabilan, 2021).

Fourth, instruction should be designed to ensure the teacher's multi-role identity in blended learning. Teaching presence is a key factor in the success of blended learning classroom activities. The role of the teacher is changing all the time, becoming more of a facilitator and helper in addition to a lecturer (Kim et al., 2014). In order to run a successful blended course and increase student motivation, teachers play the role of supervisor, facilitator, and coordinator in facilitating learning (Wang et al., 2023). When multiple devices or technologies are involved in blended instruction, faculty also need to take on the role of guiding the technology and giving students timely feedback and assistance with their devices. This means that higher education administrators must invest in mentoring programs for faculty teaching blended learning environments, taking into account the time as well as the foundational knowledge and skills required for faculty to engage in technology management and mentoring (Gurley, 2018).

Fifth, blended learning environments must also focus on the proper distribution of online and offline activities. Sonji et al. (2023) found that the majority of students appreciated clear course content, organization, instructional resources, course design, and orientation. The design approach as well as the division between online and classroom courses were the key factors influencing the satisfaction of university students with their learning experience. For most students, the theory and lecture portions are very effective online, while tutorials and feedback seem to be better suited to the face-to-face classroom (Bamoallem & Altarteer, 2022). Lindorff and McKeown (2013) also found that the majority of students preferred more interactive classroom time to more online material and that the majority of students were not interested in online forums or other extracurricular or in-class computerized activities, so the establishment of offline social presence and teaching presence is particularly important to enhance student engagement.

Sixth, it is also possible to incorporate mobile app engagement into a blended instructional environment. Nazar et al. (2019) found that while technology-enhanced active learning strategies may not significantly improve short-term grades, they can improve student satisfaction and instructional effectiveness. Mobile apps are more than just applying the online self-study process; they can also

provide learning management for the entire blended instruction so that teachers can keep track of the students' learning process. Mobile learning management systems can help learners to build a social presence online through online learning tasks, thus feeling satisfied and relaxed about blended learning (Ateş Çobanoğlu, 2018; Chuah & Kabilan, 2021).

Seventh, personalized instruction for different students is an important strategy to enhance student engagement in blended learning. Man et al. (2019) argued that profiling students on an individual basis helps instructors to identify appropriate activities to increase student engagement during blended learning. Thurlings (2014) found that higher perceived feedback was associated with more effective observed feedback and that social presence had an impact on both perceived and observed feedback. Therefore, teachers' targeted observation and feedback to students can increase students' social presence and thus be more engaged in the class emotionally.

4. DISCUSSION AND RECOMMENDATIONS

4.1 Research Findings

Through a systematic literature review method, this study screened 31 English-language empirical literature in the field of CoI-based blended instructional design in the last decade and systematically analyzed the current status of empirical research on CoI-based blended instructional design in terms of publication date, journal and citation, research design, and blended instructional design approaches and strategies. The study found that:

First, the basic information of this review article contains the publication date, the citation of the journal, and the research method. In terms of the number of publications, the number of empirical studies based on CoI blended instructional design in the past decade has been on an overall increasing trend every year and is mainly published in pedagogical and medical journals. Among them, the number of articles published in 2020 in this review is 0, which may be caused by the fact that most blended instruction was changed to pure online instruction during the COVID-19 epidemic. From the geographical distribution of authors, China and the United States have the highest percentage of authors (5 each), indicating that scholars from China and the United States dominate research in the field of CoI-based blended instructional design. Regarding the distribution of published journals, 31 articles were published in 27 different journals, of which 24 were published in educational journals, 3 in humanities and social sciences journals, 3 in medical journals, and the remaining 1 in an interdisciplinary journal. These data show a high level of interest among researchers in the field of education, as most of the articles were chosen for publication in educational journals. It is also evident that the humanities, social sciences, and medical fields have also attracted a certain number of researchers. According to the literature citations, 10 articles had more than 20 citations, while four had more than 50 citations. Among them, Kim et al.'s (2014) "A Study of Design Principles of Flipped Classrooms in Urban Universities" was cited 535 times, followed by Szeto's (2016) "Pedagogical, Social, and Cognitive Presence of Blended Synchronous Learning and Teaching," which was cited 179 times. It can be found that the topics of articles with high citation rates are mainly focused on students' learning perceptions and teachers' teaching strategies in blended learning, which is a hotspot of empirical research on blended learning design with CoI. It should be noted that the four literature sources with more than 50 citations were published between 2014-2018, which may be due to the fact that recently published articles did not have enough time to get more citations. From the perspective of research design, blended learning design with CoI empirical research focuses primarily on university students, followed by college and university teachers; the sample size presents a polarized feature, with the highest proportion of studies with 1~40 and more than 200 students; and the research method is mainly mixed and quantitative research.

The research question of this review is about instructional strategies for blended courses based on the CoI framework, so the authors further developed the discussion of these themes by analyzing and summarizing 31 articles and grouping the findings into two themes and eight sub-themes. One of

the themes is instructional design from the student learning activities. Under this theme, the authors mentioned four sub-themes: personalized learning, collaborative learning, peer interaction, and student engagement. These sub-themes were all centered on how to enhance the student learning experience. First, all ten articles mention the importance of personalized learning. In a blended course, instructors can play an active role in helping students solve problems and improve their performance by providing targeted feedback based on the varying needs and level of proficiency of each student. In Le Roux and Nagel's (2018) student interviews, some students explicitly mentioned how instructional videos through integration resonated with their personal learning preferences. Others expressed support for "learning in a more personal way outside of the classroom" (Le Roux & Nagel, 2018). Some students preferred the videos because they did not like reading at all, which may be a culturally relevant phenomenon (Bharuthram, 2012). Second, collaborative learning has also been recognized as an effective way to promote student engagement and interaction. Through group activities or partner work, students can support each other, share knowledge, and work together to solve problems, developing a sense of teamwork and collaboration in the process. Bosch and Laubscher's (2022) recommendations for blended instructional design mentioned that teachers must recognize that students enjoy group tasks. In his study, a student mentioned that it was "positive in the sense that I could get feedback from my partner. It was very helpful to receive feedback from someone going through what I am going through" (Bosch & Laubscher, 2022). At the same time, students' self-directed learning can be enhanced through the instructional design of the collaborative classroom. In addition, facilitating peer interaction is also an important consideration in blended course design. Through the use of tools such as online discussion boards or social media, instructors can encourage and guide their classmates to engage in meaningful and productive exchanges and discussions, as well as stimulate their thinking, sharing of ideas, and critical thinking skills (Kim et al., 2014). The final sub-theme was to enhance student engagement. The use of diverse and flexible educational technology tools (e.g., online quizzes, games, etc.) in the blended classroom can engage and motivate students to actively participate in exploratory, hands-on, and self-assessment activities to improve their English language knowledge and skills (Morrison & Jacobsen, 2023; Bailey & Almusharraf, 2021).

The second theme was instructional design approaches based on teachers' instructional activities. Four sub-themes were also subdivided under this theme: teacher-student interaction, teacher roles, instructional materials and environments, and mobile applications. First, in terms of teacher-student interaction, a large body of research suggests that blended course design needs to promote positive and effective teacher-student interactions. This includes encouraging students to actively participate in class discussions and teamwork activities and providing appropriate feedback mechanisms to support student learning. Wu et al. (2010) suggested that teachers should provide effective interaction tools and encourage open interaction. The study results show that interaction contributes the most to performance expectations. Second, in terms of teacher roles, the study emphasized that teachers in blended courses play an essential role as guides and mentors. They must have good communication and organizational skills and adapt and personalize instruction flexibly to students' needs. Bailey and Almusharraf (2021) stated that teachers should creatively intervene in online discussions, facilitate positive interactions, and promote meaningful language games to develop interactions and knowledge construction. Third, in terms of instructional materials and environments, research has found that blended course design requires the selection of appropriate materials integration to help students raise the point during self-directed learning (Le Roux & Nagel, 2018). Additionally, creating positive, safe, and challenging learning environments is considered important (Sonji et al., 2023). Finally, in terms of mobile applications, with the rapid development of mobile technology, more and more blended courses are adopting mobile applications to enhance interactivity and convenience. For example, it has become common practice to use cell phones or tablets for online discussions, assignment submission, and other operations (Huynh & Nguyen, 2019; Ateş Çobanoğlu, 2018; Padayachee & Campbell, 2022). Notably, Mese and Dursun (2019) used gamification elements to enrich the blended learning environment of the experimental group, but the final results showed no

differences between the two groups of students in terms of community of inquiry patterns, academic achievement, and motivation to learn.

Finally, the authors integrated the two major themes, eight sub-themes based on the main features of the blended learning strategies reviewed, and propose seven instructional guidelines for future blended educators.

4.2 Research Recommendations

Future scholars are recommended to consider two recommendations from this study. First, more research is needed to achieve deep cognitive engagement that promotes blended learning for students. Chen and Chang (2017) demonstrated that the participants had the highest proportion of "Exploration" and the second largest rate of "Integration" but rarely reached "Resolution." This implies that students' cognitive engagement was low and existed only in the shallow internalization stage of learning, which could not solve practical problems. Therefore, this will be an important indicator of the effectiveness of blended learning in the future. Future research should explore how to design and evaluate instructional strategies and activities that can increase students' level of cognitive engagement in blended learning. For example, methods such as problem-based learning, project-based learning, and case studies can be used to guide students in applying what they have learned to solve real-world problems and to provide timely and effective feedback.

Moreover, the review shows that blended teaching with social media tools, gamified learning contexts, and mobile learning approaches is gradually receiving more and more attention from researchers. For example, Cakiroglu et al.'s (2016) study on student learning engagement in gamified contexts found that gamified contexts can significantly increase students' learning engagement, improving students' academic performance. However, what factors in the gamification context will have an impact on students' learning input and what characteristics students' behavioral input, cognitive input, and emotional input will present in the gamification context have not yet been studied in depth. To sum up, when conducting empirical research on the impact of technology on blended learning, scholars can explore the influencing factors and enhancement strategies of students' learning affective variables in new teaching situations by integrating social media tools, gamified classrooms, and even immersive classrooms represented by AR/VR. This will become an important future research direction for blended instructional design.

5. CONCLUSION

The main purpose of this study was to systematically review the strategies of blended instructional design based on the CoI framework. By reviewing nearly a decade of research from both the teachers' and the students' perspectives, eight dimensions were used to develop short and long-term approaches to blended instructional design. In addition to summarizing some ideas about blended instructional design based on the past literature, the results of the study provide seven instructional guidelines on how to implement the instructional design strategies mentioned in the literature in the blended classroom. In addition, the results of the study have given the authors an understanding of some of the shortcomings of blended instruction based on the CoI framework today and the key points that have not yet been emphasized, and these areas and content should be the focus of scholars' future research. The review concluded that the design of blended courses based on CoI theory should focus on the student learning experience, including aspects such as personalized feedback, collaborative learning, peer interaction, and increased student engagement. Teachers should also integrate their own educational experiences into instructional design, with a strong emphasis on teacher-student interactions, diversity of teacher roles, integration of instructional materials and environments, and integration of mobile applications in blended instruction. In addition, university administrators need to help them in terms of policies, training, and teaching environments to strengthen the teaching and research capacity of blended faculty.

REFERENCES

Annand, D. (2011). Social presence within the community of inquiry framework. *International Review of Research in Open and Distance Learning*, *12*(5), 40–56. doi:10.19173/irrodl.v12i5.924

Ateş Çobanoğlu, A. (2018). Student teachers' satisfaction for blended learning via Edmodo learning management system. *Behavior and Information Technology, 37*(2), 133–144. *Scopus*. doi:10.1080/0144929X.2017.1417481

Bailey, D., & Almusharraf, N. (2021). Facebook in class: The instructor's influence on engagement and language play in online social media forums. *CALL-EJ*, *22*(3), 66–85.

Bamoallem, B., & Altarteer, S. (2022). Remote emergency learning during COVID-19 and its impact on university students perception of blended learning in KSA. *Education and Information Technologies, 27*(1), 157–179. *Scopus*. doi:10.1007/s10639-021-10660-7 PMID:34276241

Bharuthram, S. (2012). Making a case for the teaching of reading across the curriculum in higher education. *South African Journal of Education*, *32*(2), 205–214. doi:10.15700/saje.v32n2a557

Bosch, C., & Laubscher, D. J. (2022). Promoting self-directed learning as learning presence through cooperative blended learning. *International Journal of Learning, Teaching and Educational Research, 21*(9), 17–34. *Scopus*. doi:10.26803/ijlter.21.9.2

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. doi:10.1191/1478088706qp063oa

Cabrera, I., Villalon, J., & Chavez, J. (2017). Blending communities and team-based learning in a programming course. *IEEE Transactions on Education, 60*(4), 288–295. IEEE. doi:10.1109/TE.2017.2698467

Castellanos-Reyes, D. (2020). 20 years of the community of inquiry framework. *TechTrends*, *64*(4), 557–560. doi:10.1007/s11528-020-00491-7

Chen, H. L., & Chang, C. Y. (2017). Integrating the SOP2 model into the flipped classroom to foster cognitive presence and learning achievements. [Scopus.]. *Journal of Educational Technology & Society*, *20*(1), 274–291.

Chuah, K. M., & Kabilan, M. K. (2021). Teachers' views on the use of chatbots to support English language teaching in a mobile environment. *International Journal of Emerging Technologies in Learning, 16*(20), 223–237. *Scopus*. doi:10.3991/ijet.v16i20.24917

Cornelison, B., & Zerr, B. (2023). Comparison of pharmacy student performance in a self-care therapeutics course conducted as a flipped classroom on-campus and remotely. *BMC Medical Education, 23*(1). *Scopus*, *23*(1), 597. doi:10.1186/s12909-023-04581-x PMID:37608266

Drahota, A. M. Y., Meza, R. D., Brikho, B., Naaf, M., Estabillo, J. A., Gomez, E. D., Vejnoska, S. F., Dufek, S., Stahmer, A. C., & Aarons, G. A. (2016). Community academic partnerships: A systematic review of the state of the literature and recommendations for future research. *The Milbank Quarterly*, *94*(1), 163–214. doi:10.1111/1468-0009.12184 PMID:26994713

ElSayad, G. (2023). Higher education students' learning perception in the blended learning community of inquiry. *Journal of Computers in Education.* doi:10.1007/s40692-023-00290-y

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, *15*(1), 7–23. doi:10.1080/08923640109527071

Greene, M. (1973). *Teacher as stranger: Educational philosophy for the modern age*. Wadsworth.

Gurley, L. E. (2018). Educators' preparation to teach, perceived teaching presence, and perceived teaching presence behaviors in blended and online learning environments. *Online Learning Journal, 22*(2), 197–220. *Scopus*. Advance online publication. doi:10.24059/olj.v22i2.1255

Hains-Wesson, R., & Tytler, R. (2015). A perspective on supporting STEM academics with blended learning at an Australian university. [Scopus.]. *Issues in Educational Research*, *25*(4), 460–479.

Higgins, J. P., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., & Sterne, J. A. (2011). The Cochrane collaboration's tool for assessing risk of bias in randomized trials. *BMJ (Clinical Research Ed.)*, 343. PMID:22008217

Huang, Q., & Lee, V. W. Y. (2022). Exploring first-year university students' blended learning experiences during the COVID-19 through the community of inquiry model. *International Journal of Information and Learning Technology, 39*(4), 373–385. doi:10.1108/IJILT-02-2022-0024

Huynh, T. L., & Nguyen, U. N. T. (2019). Students' perceptions and design considerations of flipped interpreting classroom. *Theory and Practice in Language Studies, 9*(9), 1100–1110. *Scopus*. doi:10.17507/tpls.0909.05

Karaoglan-yilmaz, F., Ustun, A., Zhang, K., & Yilmaz, R. (2023). Metacognitive awareness, reflective thinking, problem-solving, and community of inquiry as predictors of academic self-efficacy in blended learning: A correlational study. *Turkish Online Journal of Distance Education*, *24*(1), 20–36. doi:10.17718/tojde.989874

Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: An exploration of design principles. *The Internet and Higher Education*, *22*, 37–50. doi:10.1016/j.iheduc.2014.04.003

Le Roux, I., & Nagel, L. (2018). Seeking the best blend for deep learning in a flipped classroom: Viewing student perceptions through the community of inquiry lens. *International Journal of Educational Technology in Higher Education, 15*(1). *International Journal of Educational Technology in Higher Education*, *15*(1), 16. doi:10.1186/s41239-018-0098-x

Lindorff, M., & McKeown, T. (2013). An aid to transition? The perceived utility of online resources for on-campus first year management students. *Education and Training, 55*(4), 414–428. *Scopus*. doi:10.1108/00400911311326045

Liu, W., Wang, J., Zhang, H., Yu, C., Liu, S., Zhang, C., Yu, J., Liu, Q., & Yang, B. (2021). Determining the effects of blended learning using the community of inquiry on nursing students' learning gains in sudden patient deterioration module. *Nursing Open, 8*(6), 3635–3644. *Scopus*. doi:10.1002/nop2.914 PMID:33973718

Man, M., Azhan, M. H. N., & Wan Hamzah, W. M. A. F. (2019). Conceptual model for profiling student behavior experience in e-learning. *International Journal of Emerging Technologies in Learning*, *14*(21), 163–175. doi:10.3991/ijet.v14i21.10936

Mese, C., & Dursun, O. O. (2019). Effectiveness of gamification elements in blended learning environments. *Turkish Online Journal of Distance Education, 20*(3), 119–142. *Scopus*. doi:10.17718/tojde.601914

Morrison, L., & Jacobsen, M. (2023). The role of feedback in building teaching presence and student self-regulation in online learning. *Social Sciences and Humanities Open, 7*(1). *Social Sciences & Humanities Open*, *7*(1), 100503. doi:10.1016/j.ssaho.2023.100503

Nazar, H., Omer, U., Nazar, Z., & Husband, A. (2019). A study to investigate the impact of a blended learning teaching approach to teach pharmacy law. *International Journal of Pharmacy Practice*, *27*(3), 303–310. doi:10.1111/ijpp.12503 PMID:30548898

Padayachee, P., & Campbell, A. L. (2022). Supporting a mathematics community of inquiry through online discussion forums: Towards design principles. *International Journal of Mathematical Education in Science and Technology, 53*(1), 35–63. doi:10.1080/0020739X.2021.1985177

Paskevicius, M., & Bortolin, K. (2016). Blending our practice: Using online and face-to-face methods to sustain community among faculty in an extended-length professional development program. *Innovations in Education and Teaching International, 53*(6), 605–615. *Scopus*. doi:10.1080/14703297.2015.1095646

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC methods programme. *Version*, *1*(1), 92.

Robinson, P., & Lowe, J. (2015). Literature reviews vs systematic reviews. *Australian and New Zealand Journal of Public Health*, *39*(2), 103–103. doi:10.1111/1753-6405.12393 PMID:25827181

Rourke, L., & Kanuka, H. (2009). Learning in communities of inquiry: A review of the literature (Winner 2009 Best Research Article Award). *International Journal of E-Learning & Distance Education*, *23*(1), 19–48.

Rubio, F., Thomas, J. M., & Li, Q. (2018). The role of teaching presence and student participation in Spanish blended courses. *Computer Assisted Language Learning*, *31*(3), 226–250. doi:10.1080/09588221.2017.1372481

Rudnicka, A. R., Jarrar, Z., Wormald, R., Cook, D. G., Fletcher, A., & Owen, C. G. (2012). Age and gender variations in age-related macular degeneration prevalence in populations of European ancestry: A meta-analysis. *Ophthalmology*, *119*(3), 571–580. doi:10.1016/j.ophtha.2011.09.027 PMID:22176800

Siah, C.-J., Lim, F.-P., Lau, S.-T., & Tam, W. (2021). The use of the community of inquiry survey in blended learning pedagogy for a clinical skill-based module. *Journal of Clinical Nursing*, *30*(3–4), 454–465. doi:10.1111/jocn.15556 PMID:33174239

Solimani, E., Ameri-Golestan, A., & Lotfi, A. (2019). Flipped vs. unplugged instructions: Sailing EFL learners' oral proficiency through virtual and real learning communities. *International Journal of Instruction*, *12*(3), 459–480. doi:10.29333/iji.2019.12328a

Sonji, G. M., Halat, D. H., Mourad, N., Sonji, N. M., Mehyou, Z., & Rahal, M. (2023). Pharmacy students' perceptions and satisfaction with blended instruction in quantitative chemical analysis course. *Pharmacy Education, 23*(1), 269–282. *Scopus*. Advance online publication. doi:10.46542/pe.2023.231.269282

Szeto, E. (2016). What effects of a community of inquiry are there on teaching in a blended learning mode? *Turkish Online Journal of Educational Technology*, (DecemberSpecialIssue), 1352–1358.

Tremmel, R. (1993). Zen and the art of reflective practice in teacher education. *Harvard Educational Review*, *63*(4), 434–459. doi:10.17763/haer.63.4.m42704n778561176

Wang, L., Liao, B., Yang, H., & Yang, C. (2023). Exploring nursing undergraduates' experiences with a redesigned blended learning course: A descriptive qualitative study. *Nursing Open*, *10*(4), 2689–2695. doi:10.1002/nop2.1478 PMID:36403244

Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, *52*(5), 546–553. doi:10.1111/j.1365-2648.2005.03621.x PMID:16268861

Wicks, D. A., Craft, B. B., Mason, G. N., Gritter, K., & Bolding, K. (2015). An investigation into the community of inquiry of blended classrooms by a Faculty Learning Community. *The Internet and Higher Education*, *25*, 53–62. doi:10.1016/j.iheduc.2014.12.001

Wu, J. H., Tennyson, R. D., & Hsia, T. L. (2010). A study of student satisfaction in a blended e-learning system environment. *Computers & Education*, *55*(1), 155–164. doi:10.1016/j.compedu.2009.12.012

Zhao, X., & Wang, J. (2020, May 15). [China Education News] During the epidemic, 1,454 colleges and universities opened 12.26 million online courses, involving 2.3 billion students. *Government Portal of the Ministry of Education of the People's Republic of China*. www.moe.gov.cn. http://www.moe.gov.cn/fbh/live/2020/51987/mtbd/202005/t20200518_455656.html#:~:text=%E2%80%9D%E5%90%B4%E5%B2%A9%E8%A1%A8%E7%A4%BA%EF%BC%8C%E5%9C%A8%E7%BA%BF

Wang Xiaoyu is a lecturer at the College of Foreign Language Education at China West Normal University. She received her Master of Education degree from China West Normal University in 2017. Since March 2020, Wang Xiaoyu has been pursuing her PhD in Language at the Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia. Her research areas are blended learning, teaching English as a second language, and mobile learning.

Nurhasmiza Abu Hasan Sazalli obtained her PhD in Education, from University of Exeter, UK. She is an active member of the International Association of Mobile Learning and the International Association of Blended Learning. One of her biggest project is the development of mobile apps content for onboarding of all new employees of McDonald's Malaysia. She also assists to map, design, develop and deliver Talent Development Programme for Gerbang Alaf Restaurants Sdn Bhd (McDonald's Malaysia). Currently, she is leading the PhD and Master in Education for Teaching of English as a Second Language programme in Universiti Teknologi Malaysia (UTM). She supervises 15 postgraduate students who are doing PhD in TESL and English language students. She is also the digital marketeer and the webmaster for the faculty as she is responsible in increasing its visibility on social media. Nurhasmiza also supervises PhD students who investigate studies related to mobile learning. She also teaches Second Language Acquisition, Innovation in Teaching & Learning, to her Master of Education (TESL) students and English language proficiency courses to UTM undergraduates.

Wan Nur Asyura Wan Adnan is a Senior Lecturer at Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia. She is trained as a discourse analyst whose core research interests are on health communication and health-related interaction on social media using netnography. Apart from that, Dr. Wan is also an English language teacher trainer at the faculty whose expertise is on language teaching methodologies and technology in language teaching.