

Reflecting on the Past to Shape the Future: A Systematic Review on Cross-Cultural Collaborative Learning from 2011 to 2020

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Abstract: Cross-cultural collaborative learning in different learning domains is the road to the sustainability of economic, social, and environmental development. It creates the appropriate environment to acquire cross-cultural communication and collaboration skills for the 21st century. This study conducted a systematic review of 54 articles on cross-cultural collaborative learning published from 2011 to 2020. Based on the proposed analysis framework, the major elements of cross-cultural collaborative learning are revealed, including learners, group composition, learning environment, cross-cultural learning content, collaborative learning strategies, and research designs. The results indicated that most studies engaged learners at the university level and adopted small group sizes in cross-cultural collaborative learning activities. The online learning environment and social science learning content were widely employed in the past 10 years. Most studies adopted multiple collaborative learning strategies and lasted for 9 to 24 weeks. Most studies targeted mixed research purposes and adopted the qualitative analysis method. The findings and relevant suggestions for future studies are discussed in depth.

Keywords: cross-cultural collaborative learning; systematic review; collaboration; communication



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1. Introduction

Globalization, world economics, the internationalization of educational institutions, and the rapid development of telecommunications technology have turned the world into a global village [1]. Hence, there is pressure on educational institutions to educate and help students develop skills required in the 21st century working environment by adjusting education curricula [2]. For instance, Van [3] reported the relentless concern of the Vietnamese government to develop a cross-cultural curriculum for foreign language learning by collaborating with experts and international publishers including Macmillan Education and Pearson Education to develop textbooks. Additionally, Syzenko and Diachkova [2] discovered that cross-cultural projects supported by technology have a positive effect on learners' language proficiency and develop their cross-cultural competence. A well-designed 21st century curriculum focuses on giving students increased experiences targeted towards developing these skills through student-centered activities. Learning and innovation skills made up of collaboration, communication, critical thinking, problem-solving, and creativity and innovation [4], social and cross-cultural skills, and information and communications technology skills [5] are referred to as 21st century skills. These skills are necessary for driving a sustainable development mindset among learners. Hence, different frameworks and strategies, such as collaborative learning and cross-cultural learning, have been adopted to create and engage learners in real world scenarios and environments.

Collaborative learning has received much attention for decades from educators and researchers [6]. Collaborative learning can be referred to as a teaching and learning method that engages groups of individuals to learn and work together with a common goal [7]. Through technology-supported collaborative learning, individuals from different cultures can interact

to solve real world problems [8–10] without limitation of time and place [11]. Moreover, the benefits of collaborative learning include improving knowledge building, shared knowledge, social interaction, and learning achievements [12]. Collaborative learning promotes high-order skills and knowledge gains required to work in an international environment [13].

To develop good social and cross-cultural skills, learners need to interact and work more efficiently with people in their groups or culturally diverse teams at the workplace, school, or in a virtual community [5]. Cultures, according to White [14], involve shared knowledge that evolves through social interactions between individuals within the same social context. Culture is significant in the affairs of humans as it influences perceptions and protocols [15]. The cultural background of individuals plays a role in how they think, behave, and interact with others. For example, a study by Shi et al. [16] investigated the role cultural experience plays on self and socially oriented learning processes and actions among Chinese and Canadian students. The researchers found that among the homogenous groups, Canadian pairs displayed self-regulated learning action more than the Chinese pairs, whereas the mixed pairs did not show any significant difference. In another study by Strickland and co-authors [17], students from Finland, the USA, and Scotland were involved in a cross-cultural collaborative learning activity to provide international experience for students enrolled in a nursing program and the results indicated that students were satisfied and the activities promoted learning together thereby removing cultural barriers such as mistrust. Therefore, cross-cultural collaborative learning has gained the attention of researchers and educators as a method for not only giving learners international experience but also improving cross-cultural communication skills. Studies such as those by Kumi-Yeboah [18] and Zhu [19] confirm that cross-cultural collaborative learning stimulates the shared construction of knowledge through engagement, social interaction, and collaboration. Cross-cultural collaborative learning studies are increasing to provide students opportunities to have international experience and global competence for a sustainable world. Therefore, it is significant to explore how researchers design cross-cultural collaborative learning activities based on elements proposed by Kumi-Yeboah [18] and Chen et al. [20] in the research area.

Furthermore, cross-cultural collaborative learning has been confirmed to promote international and professional competencies. However, researchers need to investigate the duration as a significant variable [21]. There are studies on how various instructional support [22] and collaborative learning strategies influence cross-cultural communication competence but these studies are limited. In addition, the appropriate sample size and group compositions which are crucial variables for effective collaboration among diverse groups, suitable for generalizing results [1,23] are understudied. Social aspects of cross-cultural collaborative learning such as social interaction and communication competency need to be explored further [24]. Therefore, there is a need for a comprehensive review of how cross-cultural collaborative learning was conducted in the past.

This study developed an analysis framework for a systematic review of cross-cultural collaborative learning literature papers from 2011 to 2020. This framework was adapted from Fu and Hwang [6] with some elements from Kumi-Yeboah [18] to tailor the research purpose of this study. When designing cross-cultural collaborative learning, practitioners need to consider research design, group composition, different strategies, content, resources, and the online environment that bridges geographic and cultural backgrounds. Therefore, the framework focuses on six elements of cross-cultural collaborative learning, including learners, group composition, learning environment, cross-cultural learning content, collaborative learning strategies, and research design.

2. Literature Review

2.1. Cross-Cultural Collaboration in the Field of Education

In a cross-cultural learning environment, individuals acquire new skills, knowledge, and attitudes by engaging and interacting with others from different cultural backgrounds [25]. Cross-cultural collaboration requires interaction which can be achieved

through different approaches. The first approach is to adopt technology integration and the second approach is without technology integration. Collaboration among learners in an on-line setting promotes cultural awareness, and increases lexical and cultural knowledge [26]. Furthermore, interacting with others from different cultural backgrounds has more benefits, although it is challenging [21]. To conduct cross-cultural collaboration, educators and designers should have more guidance on how to design and conduct cross-cultural collaboration successfully [27]. Some studies have highlighted that cross-cultural collaboration can cause social tensions and is also challenging [28]. To curb these challenges, experts in the field have employed different learning strategies [24] such as problem-solving, group investigation, storytelling, and role-play. Previous studies suggest that instructor or teacher involvement and support during cross-cultural collaboration is very significant [29,30].

2.2. The Deficiency of Previous Reviews

Previous related reviews have investigated the different aspects of cross-cultural collaboration and focused on predictors of international students' adjustment, effects on language learning, instruments for measuring skills obtained in cross-cultural contexts, and the affordances of technologies for learning in cross-cultural contexts. A systematic review on cultural concepts and their implications for intercultural collaborative online learning by [31] investigated the cultural effects on social behaviors, cognition, and the implications of online collaboration. Their study found that cultural issues identified in most of the studies ignored cultural issues in social interaction, the relationship between culture and affordances, and the design of interfaces for online collaboration platforms. Yet, there is no systematic review of how cross-cultural collaborative activities are designed and implemented. A recent review by Chen and Gabrenya [32] was aimed at investigating the quality of instruments adopted for the evaluation of individual capabilities living and working in cross-cultural contexts, and the results indicated that cross-cultural competence measurement in terms of convergent validity was good, however, discriminant validity was lacking. However, this study did not delve deep into what these instruments were being used to measure, the research purpose, and the research methods used. Furthermore, Avgousti [33] analyzed 57 empirical studies on the impact of online intercultural exchange on first and second language learners' intercultural communicative competence. The author focused on the use of web 2.0 technologies used to support online intercultural exchange. Hence, other technologies and their roles were not included. In another recent review, Cao and Meng [34] analyzed 33 articles to identify predictors of international students' adjustment in China as a multicultural environment. From the above studies, it can be seen that cross-cultural collaborative learning is significant for helping students enhance their cross-cultural communication skills to be global citizens.

There are several studies on cross-cultural collaboration, however, there are limited systematic reviews on cross-cultural collaborative learning. Moreover, there is limited information on which learning strategies or methods are more effective and the learning domains that the researcher preferred for cross-cultural collaboration from 2011 to 2020. To the best of our knowledge, no systematic review has explored the following aspects such as level of participants being engaged, the learning environments, materials and technologies used for the learning environment and the role of these tools, the learning domains, and research designs in cross-cultural collaborative learning over the last decade. Therefore, this study aimed to conduct a comprehensive analysis through the systematic review procedure to bridge the above-mentioned gaps by synthesizing significant components of cross-cultural collaborative learning activities.

2.3. The Need for this Study

Based on our literature search, it was found that there are no reviews on cross-cultural collaborative learning that carefully examine how cross-cultural collaborative activities were designed over the past ten years from 2011 to 2020. Moreover, essential elements such as the demographic information of participants, the learning context, interaction

strategies used, and tools and methods used for effective cross-cultural collaborative learning activities are not known. Previous studies have investigated certain aspects of cross-cultural collaboration necessary for the advancement of this domain. Therefore, the current study investigated the evolving trends, major areas of focus, and different components employed by researchers and educators to provide international experience, knowledge, social and cross-cultural skills, and ICT skills for students. A systematic review on cross-cultural collaborative learning activities designed by researchers would contribute to the current literature by revealing the trends and current status of cross-cultural collaborative learning studies. Moreover, it would serve as a knowledge resource for future studies when planning to design and engage cross-cultural collaboration research as it reveals interesting findings and implications for the research area. Most significantly, an in-depth analysis of the literature papers would reveal various purposes for which cross-cultural collaborative learning studies are conducted.

2.4. Research Purposes and Research Questions

To bridge the research gap, which is a lack of systematic review that examines multiple dimensions of cross-cultural collaborative learning over the past ten years, this study was designed to meet the following objectives; (i) to conduct systematic analysis and provide statistical evidence about the essential elements of cross-cultural collaborative learning in different contexts from 2011 to 2020; (ii) to determine whether the modified conceptual framework for analysis is capable of serving as a guided framework for future studies; (iii) to identify understudied areas over the last ten years concerning cross-cultural collaborative learning; (iv) to contribute to the current literature by providing comprehensive information on cross-cultural collaborative learning; and (v) to recommend areas of cross-cultural collaborative learning that need researchers' attention. To achieve these objectives, the following research questions were developed:

RQ1: Who participated in the cross-cultural collaborative learning?

RQ2: What is the group composition adopted in cross-cultural collaborative learning studies?

RQ3: What is the learning environment in cross-cultural collaborative learning studies?

RQ4: What are the cross-cultural learning contents used in cross-cultural collaborative learning activities?

RQ5: What are the collaborative learning strategies in cross-cultural collaborative learning?

RQ6: What are the research designs of cross-cultural collaborative learning studies?

The remainder of this paper describes the methods involved in the data collection, followed by a discussion and conclusion. The methods section reports the procedure for retrieving the literature samples and how data were extracted and analyzed. The results section reports the findings from the sample literature and the fourth section discusses and interprets the findings based on the conceptual framework and literature. Last, the findings, implications, contributions, and recommendations for future studies are summarized in depth.

3. Methods

The systematic review is a scientific process that was deemed as the appropriate approach for retrieving and analyzing the research foci for this review [35]. This section of the paper describes the processes used to obtain the selected literature and a synthesis. The procedure involved eligibility criteria, data collection process, information sources, search strategy, selection process, data items, study risk of bias assessment, and data analysis framework.

3.1. Data Collection

To achieve the objectives of this systematic review, a literature search began by querying the Web of Science, Scopus, and ERIC databases since these databases publish high-quality papers and have been used in a previous study by Zheng et al. [36]. The search was conducted from 1 to 15 August 2021. This systematic review limited the search to topics

on cross-cultural collaborative learning and intercultural collaborative learning using the databases. The search keywords and Boolean connectors applied to the literature search included (cross-cultural OR intercultural) AND (collaborative learning OR online collaborative learning OR cross-cultural collaborative learning) AND (cross-cultural collaboration). The search results were limited to the most recent ten years, namely from 1 January 2011, to 31 December 2020. The total search result was 610 papers out of which 312 papers were retrieved from ERIC, 129 papers from Web of Science, and 169 papers from the Scopus database, respectively.

3.2. Eligibility Criteria

The inclusion and exclusion criteria were set based on research purposes to determine the papers appropriate for this study. Therefore, to meet the eligibility criteria, a research paper first had to involve participants in a cross-cultural collaborative learning or cross-cultural collaboration activity. Next, the papers had to include information related to how to conduct cross-cultural collaborative learning. Then, the publication date had to be from 2011 to 2020. The following steps were followed for the selection process:

- (a) Exclusion of papers not published in 2011 to 2020 ($n = 282$);
- (b) Removing non-journal literature such as book reviews, conference papers, editorials, and commentaries ($n = 117$);
- (c) Removing duplicates and non-English language papers ($n = 35$);
- (d) Exclusion of studies that were cross-cultural collaboration but not collaborative learning among researchers or participants and cross-cultural collaboration between institutions that did not focus on nor involved participants in collaborative learning activity ($n = 122$).

3.3. Quality Criteria

The selected papers were examined for quality which, according to Yeh and colleagues [37], is how well the research was designed and executed. There were cross-cultural collaboration studies that did not include group activities and interaction and therefore were rejected. Figure 1 shows the paper selection process. Finally, 54 literature papers were retrieved from the searched 610 papers. The distribution of the number of papers found from 2011 to 2020 is presented in Figure 2 below.

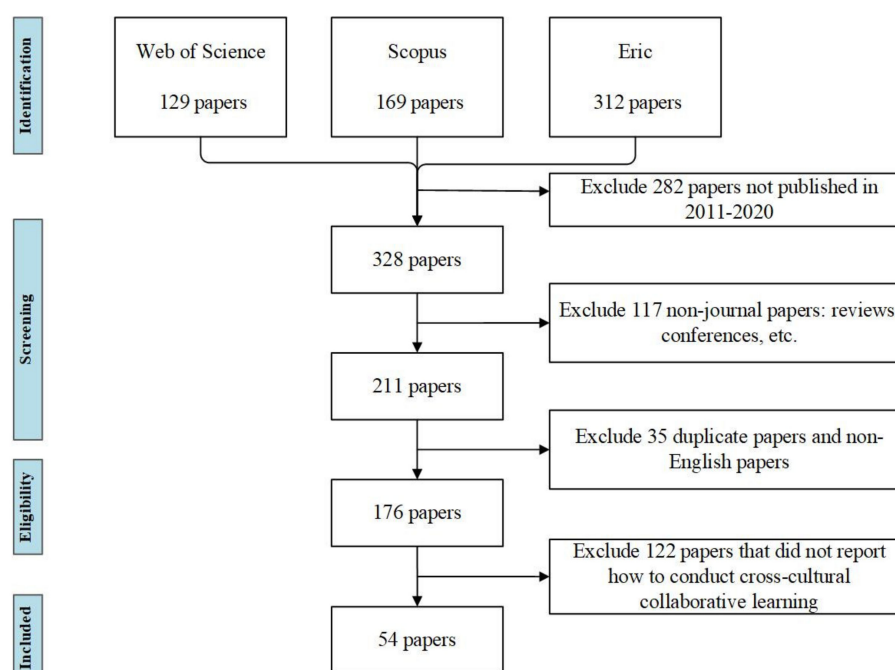


Figure 1. Illustration of the paper selection procedure.

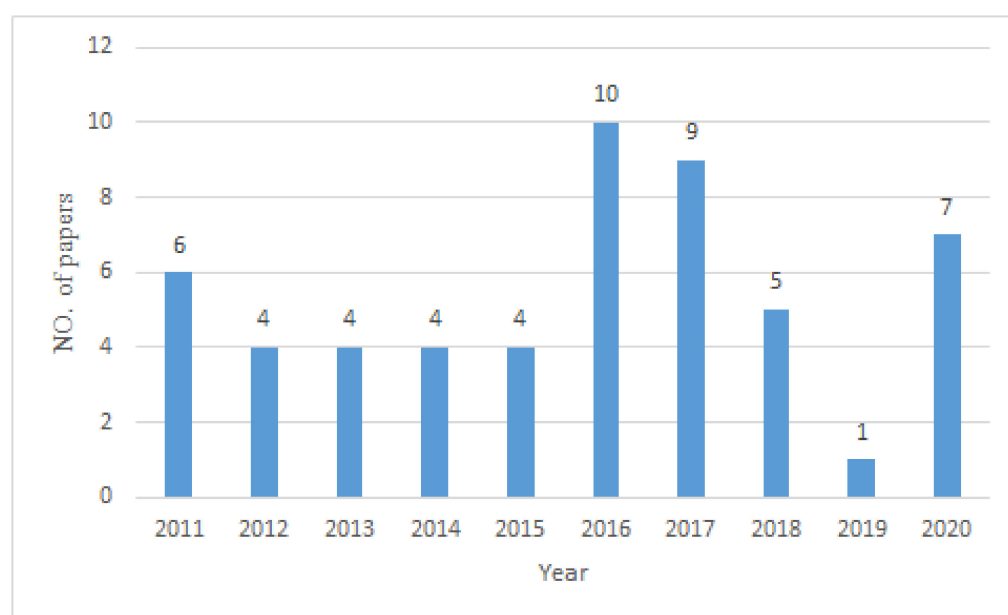


Figure 2. Distribution of 54 papers from 2011 to 2020.

3.4. Theoretical Framework for Data Analysis

The proposed analysis framework was modified for cross-cultural collaborative learning and used as a guide for the analysis of data. The social constructivism perspective, which views learning as a collective construction of knowledge through social interaction [38], and the literature informed the elements included in the framework. Different cross-cultural collaborative learning approaches were considered for the modified framework from the literature. Four specific instructional strategies are group work, self-introductions, the use of online platforms, and incorporating global instances into the curriculum to be effective [18,39] when applied to cross-cultural collaborative learning. During cross-cultural collaborative learning, individuals from different cultures interact and learn or work together with expectations of different behaviors and communication practices [20]. Furthermore, with the 21st century abilities as a focus to help students overcome challenges that may occur during learning with cross-cultural teams, three scaffolding stages have been proposed on the Ohio State University blog [40] and applied to different instances in the Asia Society's report [41]. The order of these stages involves first building trust through sharing and learning about cultural background. Second, the community building stage involves learners obtaining knowledge about their team members' countries, and the last stage is the collaboration stage which requires students to complete a group task. The above-cited literature and blogs informed the design of the proposed framework. To design a cross-cultural collaborative learning activity, it is important to group learners from different cultural backgrounds to engage in a group activity; the learning environment and learning content should be designed from a global perspective; instructional approaches and strategies are necessary for successful communication and learning and should be carefully designed based on the research objectives and design. The elements, learners, group composition, learning environment [6], cross-cultural learning content, collaborative learning strategies, and research design were included in the framework. Learners represent research participants or subjects who participated in the study. Group composition refers to how cross-cultural collaborative groups were formed, that is homogenous, heterogeneous, or both, and the group size [42]. The learning environment involves the learning setting (such as online learning, blended learning, mobile learning, etc.), the hardware and software materials or tools used, and the role of technologies. Furthermore, cross-cultural learning content involves the use of meaningful and culturally relevant learning content [43]. Collaborative learning strategies involve

collaborative learning methods (e.g., learning together, learning achievement, etc.), interaction methods, collaborative tasks, interaction methods and tools, intervention strategies, and the duration of cross-cultural activities. For instance, one of the collaborative learning strategies is role-play [44]. Finally, research design refers to the research approach adopted in cross-cultural collaborative learning studies.

To train learners to develop cross-cultural competence, a cross-cultural collaborative learning activity with appropriate group composition, collaborative learning strategies for the specific learning environment and learning content should be carefully considered during design. To be cross-culturally competent, individuals need to know how to communicate, with mindset and image, about other cultures which can be achieved through awareness and understanding. Therefore, the proposed framework was developed to suit the purpose of this systematic review. Figure 3 illustrates the framework which includes six elements that were further used to generate the coding scheme. The six elements are explained below:

- The learners are the research participants who participated in the selected literature papers and the extracted data include sample level, cultural background, country, and sample size;
- Group composition includes group size and group member selection (e.g., heterogeneous, homogeneous);
- Learning environment is the setting for cross-cultural collaborative learning utilized in the analysed papers which includes the learning setting, hardware, software, and the roles of these devices utilized in the analysis papers;
- The cross-cultural learning content includes learning domains and learning outcomes;
- The collaborative learning strategies include interaction methods, collaborative learning methods, interaction tools, collaborative learning task types, interaction types, interaction tools, teacher involvement, intervention strategies, duration, and communication language;
- Research designs adopted for cross-cultural collaborative studies include research purpose, experimental design, and data analysis methods.

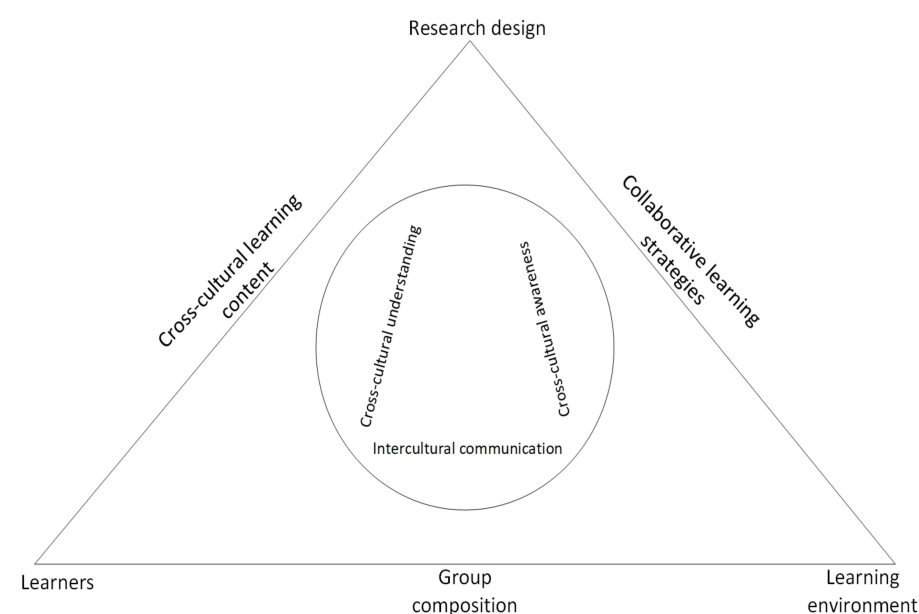


Figure 3. The proposed framework for cross-cultural collaborative learning.

Table 1 shows the developed coding scheme based on previous studies [6,18,45,46]. Furthermore, the statistical analysis of the extracted data is presented in a table format which displays the proportion of studies. To calculate the trends and growth rate of the

overall data, the initial value and ending value were determined in the first five years (2011 to 2015) and the second five years (2016 to 2020) [47].

Table 1. The coding scheme.

Elements	Super-Dimensions	Sub-Dimensions
Learners	Sample level	1. Elementary
		2. Middle school
		3. High school
		4. College/university
		5. Mixed
	Cultural background	1. Western
		2. Eastern
		3. Mixed
		4. Not Specific
	Country	1. 2 countries
		2. 3–5 countries
		3. More than 5 countries
	Sample size	1. 1–50
		2. 51–100
		3. 101–300
		4. More than 300
		5. Not specific
Group composition	Group size	1. Small size (3–5 learners)
		2. Medium size (6–10 learners)
		3. Large size (More than 10 learners)
		4. Mixed
		5. Not specific
	Group member selection	1. Homogenous (culture/country)
		2. Heterogeneous (culture/country)
		3. Mixed
		4. Not specified
Learning environment	Learning setting	1. Online learning
		2. Blended learning
		3. Mobile learning
		4. Mixed
		5. Not specific
	Hardware	1. Mobile devices
		2. Computers
		3. Mixed
		4. No hardware
		5. Not specific
	Software	1. LMS
		2. Social media app
		3. Website
		4. Data collection or analysis software
		5. Mixed
	Role of technologies	6. No software
		7. Not specific
Cross-cultural learning content	Learning domains	1. Group discussion
		2. Evaluation and assessment
		3. Learning resource storage and sharing
		4. Design
		5. Mixed
		6. Not specified
	Learning outcomes	1. Engineering/computers
		2. Science
		3. Social science/social studies
		4. Arts/design
		5. Languages
		6. Business management
		7. Mixed
		1. Cross-cultural communication competency
		2. Cross-cultural understanding
		3. Learning achievement
		4. Learning engagement
		5. Learning perception
		6. Mixed

Table 1. Cont.

Elements	Super-Dimensions	Sub-Dimensions
Cross-cultural collaboration strategies	Collaborative learning methods	1. Discussion
		2. Team game
		3. Group investigation
		4. Learning together
		5. Collaborative creation
		6. Project-based inquiry
		7. Project-based learning
		8. Problem-based learning
		9. Mixed
	Interaction methods	1. Synchronous
		2. Asynchronous
		3. Mixed
		4. Not specific
	Collaborative learning task types	1. Inquiry
		2. Simulation
		3. Investigation
		4. Issue discussion
		5. Problem-solving
		6. Engineering/educational product design
		7. Knowledge acquisition
		8. Mixed
	Interaction types	1. Student-student
		2. Teacher-teacher
		3. Mixed
	Interactive tools	1. Video calls
		2. Audio messages
		3. Text messages
		4. Mixed
		5. Not specific
	Teacher involvement	1. Teacher guidance
		2. No guidance
		3. Not specific
	Intervention strategies	1. Scaffolding
		2. Collaborative scripts
		3. Games
		4. Mixed
	Duration	1. Less than one day
		2. 1–7 day
		3. 2–4 weeks
		4. 5–8 weeks
		5. 9–24 weeks
		6. More than 24 weeks
		7. Not specified
Research design	Communication language	1. English
		2. Mixed
		3. Others (Thai)
		4. Not specified
	Research purpose	1. Cross-cultural understanding
		2. Cross-cultural communication
		3. Cross-cultural learning content
		4. Cross-cultural challenges
		5. Cross-cultural competence
		6. Effects of tools
		7. Mixed
	Experimental design	1. True experimental design
		2. Quasi-experimental design
		3. Others
	Analysis methods	1. Quantitative
		2. Qualitative
		3. Qualitative and quantitative

3.5. Inter-Rater Reliability

For reliability of the data coding, two of the authors analysed the retrieved 54 research papers. The Fleiss' kappa [48] was employed to compute the inter-rater reliability and it achieved 0.88, indicating high reliability.

4. Results

This section of the systematic review presents the statistical analysis and descriptive analysis of the research findings. The results are organised based on the research questions. The proportions and growth rates are presented in tables and further described. First, they describe the research subjects or participants followed by the group composition which includes the group sizes and how group members were assigned based on their cultural background or nationality. Next, the learning environment which is the learning setting adopted by educators and researchers for successful cross-cultural collaboration, followed by the learning content of the cross-cultural studies are described. Then, the cross-cultural collaboration strategies that were employed for successful activity and as intervention are presented. Last, the research design, based on research purpose or objectives for engaging participants in a cross-cultural collaborative learning activity, and the analysis methods are described.

4.1. Learners Involved in Cross-Cultural Collaborative Learning Activities from 2011 to 2020

This sub-section of the paper describes the research participants who were involved in cross-cultural collaborative learning activities from 2011 to 2020. Different levels of participants included elementary level, middle school level, high school level, college or university level, and working adults. Based on the results, most of the analysed studies engaged learners at the college or university level in cross-cultural collaborative learning activities constituting 72%, followed by the studies that used mixed levels of participants constituting 14% of the 54 literature papers. Middle school, high school, and working adults constituted 4% each and only 2% were found to have involved elementary level learners. The statistical distributions are presented in Table 2 below.

Table 2. Distribution of learners engaged in cross-cultural collaborative learning from 2011 to 2020.

Variable	Category	No. of Studies	Proportion of Studies
Sample level	Elementary	1	2%
	Middle school	2	4%
	High school	2	4%
	College/university	39	72%
	Working adults	2	4%
Cultural background	Mixed	8	14%
	Western	11	20%
	Eastern	4	8%
	Mixed	38	70%
	Not specific	1	2%
Country	2 countries	31	57%
	3–5 countries	9	17%
	More than 5	14	26%
	1–50	28	52%
Sample size	51–100	9	16%
	101–300	14	26%
	More than 300	2	4%
	Not specific	1	2%

The majority of the studies engaged participants from two or more cultural backgrounds which can be seen in Table 2 below. For instance, diverse cultural backgrounds such as eastern and western cultures and western and southern cultures were engaged in

38 out of 54 papers. The second most engaged participants were from western cultures, whereas the least were studies that engaged participants from eastern cultural backgrounds.

According to Table 2, the majority of studies engaged participants from two countries with a sample size between 1–50 or 52–100. For instance, MacLeod et al. [23] engaged 35 participants from China and the USA. Similarly, Shi et al. [16] engaged 60 participants from China and Canada. Researchers rarely engaged a sample size above 300 except [19,49] who reported a sample size above 300.

Furthermore, to demonstrate the current trend and status of learners and participants of cross-cultural collaborative learning studies, the growth rate analysis is presented in Table 3. From the findings, the number of studies that engaged college and university participants increased by 43.75%. Surprisingly, high school, working adults, and mixed participants did not increase, while elementary and middle schools were involved over the last five years (from 2016 to 2020). Participants from eastern cultures obtained a 200% increase compared to studies that involved participants from western and mixed cultures, respectively. Concerning countries of participants, studies that engaged 2 countries increased by 81.82%, followed by studies that engaged 3 to 5 countries. Moreover, researchers preferred small sample sizes from 2016 to 2020.

Table 3. The growth rate of participants.

Variable	Category	2011–2015	2016–2020	Growth Rate
Sample level	Elementary	0	1	NA
	Middle school	0	2	NA
	High school	1	1	0
	College/university	16	23	43.75%
	Working adults	1	1	0
	Mixed	4	4	0
Cultural background	Western	4	7	75%
	Eastern	1	3	200%
	Mixed	17	21	23.53%
	Not specific	0	1	NA
	2 countries	11	20	81.82%
Country	3–5 countries	4	5	25%
	More than 5	7	7	0
Sample size	1–50	8	20	150%
	51–100	6	3	–50%
	101–300	7	7	0
	More than 300	1	1	0
		0	1	NA

4.2. Group Composition in Cross-Cultural Collaborative Learning from 2011 to 2020

Table 4 shows that most studies employed a small group size which was 44% of the literature papers that were analysed. However, the second-highest were studies that were not specific with the group size. It must be noted that some studies engaged different sample sizes (mixed) and these were 15%, that is the same as the medium group size. In addition, group members were mostly heterogeneous being 73% of the 54 papers. Furthermore, the proportions of studies that engaged both homogenous and heterogeneous groupings achieved 13%. There were equal proportions of studies that compared homogenous groups and those that did not specify whether group members were the same culture, diverse, or mixed.

Table 4. Distribution of group composition during cross-cultural collaborative learning from 2011 to 2020.

Variable	Category	No. of Studies	Proportion of Studies
Group size	Small size (3–5 learners)	24	44%
	Medium size (6–10 learners)	8	15%
	Large size (More than 10 learners)	2	4%
	Mixed	8	15%
	Not specific	12	22%
Group member selection	Homogenous (culture/country)	4	7%
	Heterogeneous (culture/country)	39	73%
	Mixed	7	13%
	Not specified	4	7%

The in-depth analysis in Table 5 shows that small group size and mixed group size increased significantly by 66.67% from the initial five years (2011 to 2015) to the second five years (2016 to 2020). Next to the small group size were studies that were not specific with the group size which increased by 40% over the second five years. However, medium and large group sizes did not obtain any group in terms of frequency. Concerning how group members were selected, the number of studies that did not specify achieved a growth rate of 200%. Next were studies that engaged students in diverse cultural groups (heterogeneous). However, studies that employed mixed group member selection decreased by 25%. Lastly, there were equal proportions of homogenous groups in the initial five years and the most recent five years, and therefore did not obtain any growth.

Table 5. The growth rate of group composition of cross-cultural collaborative learning studies from 2011 to 2020.

Variable	Category	2011–2015	2016–2020	Growth Rate
Group size	Small size (3–5 learners)	9	15	66.67%
	Medium size (6–10 learners)	4	4	0
	Large size (More than 10 learners)	1	1	0
	Mixed	3	5	66.67%
	Not specific	5	7	40%
Group member selection	Homogenous (culture/country)	2	2	0
	Heterogeneous (culture/country)	15	24	60%
	Mixed	4	3	–25%
	Not specified	1	3	200%

4.3. The Learning Environment of Cross-Cultural Collaborative Learning Studies from 2011 to 2020

According to the results in Table 6, most cross-cultural collaborative studies utilized an online learning environment, followed by blended learning. Face-to-face settings were also used in some studies at a proportion of 15%, but few studies utilized mobile and mixed learning settings. With learning materials, the majority of the studies used more than one hardware and software. However, 6% did not specify the hardware materials while 10% did not specify the software used. Comparably, few studies used computers or mobile devices only. Concerning the role of technologies or learning materials during cross-cultural collaborative learning, a great number of the studies used them for mixed (more than one role) purposes. Next to mixed were studies that used technologies for supporting group and online learning.

Table 7 shows the growth rate of the learning environment. It was found that studies that used mixed learning settings increased by 300% in the second half of the ten years. Next, face-to-face increased by 66.67% in the second half of the ten years, followed by online learning which increased by 27.27%. On the other hand, blended learning decreased by 28.57% in the second half of the past ten years. Two studies employed mobile learning settings in the second half of the ten years. Concerning hardware, it was discovered that the use of mixed devices increased by 5.88% while studies that used only computers decreased by 20%. It must be noted that, within the ten years, studies on the use of mobile devices got researchers' attention in the second half (from 2016 to 2020). More so, 3 studies did not use

hardware and 3 studies were not specific with the kind of hardware used. Studies that did not include software increased by 200%, followed by studies that did not name the software used at a rate of 50%. Studies that used more than one software gained the minimum increase at a rate of 7.14%. It was surprising to discover that studies that used learning management systems (LMS) did not increase, while the use of social media applications began to receive attention in the second half (from 2016 to 2020) of the ten years. Using technology as a support for only group discussion or as learning resource storage and sharing obtained an upsurge of 200% each. Similarly, studies that did not specify any role of the technology increased by 200% in the second half of the ten years.

Table 6. Distribution of learning environment design over the past ten years.

Variable	Category	No. of Studies	Proportion of Studies
Learning setting	Face-to-Face	8	15%
	Online learning	25	46%
	Blended learning	12	22%
	Mobile learning	2	4%
	Mixed	5	9%
	Not specific	2	4%
Hardware	Mobile devices	4	7%
	Computers	9	17%
	Mixed	35	64%
	No hardware	3	6%
	Not specific	3	6%
	LMS	4	7%
Software	Social media app	6	11%
	Website	4	7%
	Data collection/analysis software (e.g., Fulcrum)	2	4%
	Mixed	29	54%
	No software	4	7%
	Not specific	5	10%
Role of technologies	Group discussion	12	22%
	Evaluation and assessment	1	2%
	Learning resource storage and sharing	4	7%
	Design	1	2%
	Mixed	32	60%
	Not specified	4	7%

4.4. Cross-Cultural Learning Content in the Recent Past 10 Years

Table 8 shows that social sciences or social studies topics were widely applied in the most recent past ten years. The second widely used learning domain was science, followed by business management and studies that applied more than one learning domain (mixed) with the same proportion, then engineering or computers, arts or design, and languages. Concerning learning outcomes, most researchers explored mixed learning outcomes (61%), such as both cross-cultural understanding and learning achievements. For instance, O'Donovan and colleagues [50] engaged diverse participant levels in a cross-cultural collaborative science activity, and measured outcomes were learning perceptions and learning engagement. Next to mixed outcomes were studies that measured learning perceptions. However, cross-cultural communication competency, learning achievements, and cross-cultural understanding were less explored.

Table 9 below demonstrates that studies that engaged participants in mixed learning domains increased by 500% in the second half of the ten years. Next, business management surged by 150%, followed by science at 50%, then social science or social studies by 25%. Concerning the status of learning outcomes, learning perceptions increased 150%, followed by mixed learning outcomes from 2016 to 2020 compared to 2011 to 2015. However, learning engagement was not applied over the past five years of the ten years duration.

Table 7. The growth rate of the learning environment in cross-cultural collaborative learning.

Variable	Category	2011–2015	2016–2020	Growth Rate
Learning setting	Face-to-Face	3	5	66.67%
	Online learning	11	14	27.27%
	Blended learning	7	5	−28.57%
	Mobile learning	0	2	NA
	Mixed	1	4	300%
	Not specific	0	2	NA
Hardware	Mobile devices	0	4	NA
	Computers	5	4	−20%
	Mixed	17	18	5.88%
	No hardware	0	3	NA
	Not specific	0	3	NA
	LMS (e.g., Blackboard)	2	2	0
Software	Social media app	0	6	NA
	Website	3	1	−66.67%
	Data collection/analysis software (e.g., Fulcrum)	0	2	NA
	Mixed	14	15	7.14%
	No software	1	3	200%
	Not specific	2	3	50%
Role of technologies	Group discussion	3	9	200%
	Evaluation and assessment	0	1	NA
	Learning resource storage and sharing	1	3	200%
	Design	1	0	NA
	Mixed	16	16	0
	Not specified	1	3	200%

Table 8. Distribution of cross-cultural learning domains and outcomes in the most recent 10 years.

Variable	Category	No. of Studies	Proportion of Studies
Learning domains	Engineering/computers	6	11%
	Science	10	19%
	Social science/social studies	18	33%
	Arts/design	4	7%
	Languages	2	4%
	Business management	7	13%
	Mixed	7	13%
Learning outcomes	Cross-cultural communication competency	2	4%
	Cross-cultural understanding	1	2%
	Learning achievement	2	4%
	Learning engagement	2	4%
	Learning perceptions	14	25%
	Mixed	33	61%

Table 9. The growth rate of cross-cultural collaborative learning content from 2011 to 2020.

Variable	Category	2011–2015	2016–2020	Growth Rate
Learning domains	Engineering/computers	3	3	0
	Science	4	6	50%
	Social science/social studies	8	10	25%
	Arts/design	3	1	−66.67%
	Languages	1	1	0
	Business management	2	5	150%
	Mixed	1	6	500%
Learning outcomes	Cross-cultural communication competency	1	1	0
	Cross-cultural understanding	0	1	NA
	Learning achievement	1	1	0
	Learning engagement	2	0	−100%
	Learning perception	4	10	150%
	Mixed	14	19	35.71%

4.5. Cross-Cultural Collaborative Learning Strategies over the Past Ten Years

Table 10 shows the adopted collaborative learning strategies. The findings revealed that the most applied collaborative learning method was mixed, which is adopting more than one method. The second most applied was the discussion method, followed by project-based learning. Project-based inquiry, learning together, collaborative creation, team game, group investigation, and problem-based learning were less applied over the past ten years. In addition, interaction methods that were mostly employed by researchers were mixed, followed by the synchronous method. Few studies were found to apply asynchronously and one paper was not specific with the interaction method. Furthermore, collaborative task types were mostly mixed, followed by issue discussion. Concerning task types, mixed tasks were also most utilized constituting 56% of the 54 papers. The second most applied task was issue discussion which was 27%. Other tasks such as problem-solving, engineering or educational product design, knowledge acquisition, inquiry, and investigation were the least task types applied over the past ten years.

Furthermore, the most applied interaction type was student-to-student interactions, followed by mixed interactions (teacher-student). Only 1 out of 54 papers applied teacher-to-teacher interaction. From 2011 to 2020, the majority of studies used mixed interaction tools such as text and video conferencing. The second most utilized tool was text messages, but only 1 out of the 54 studies used video calls and audio calls each as a means for interaction. Almost all the studies involved teacher guidance except 4 out of 54 papers that did not apply teacher guidance. These 54 papers mostly guided participants on how to form groups, how to collaborate, and how to use collaborative learning tools or platforms. On the other hand, 4 papers did not specify whether there was teacher support or guidance. Concerning the intervention strategies that were employed, it was found that most of the studies used collaborative scripts as a guideline. Scaffolding and mixed intervention strategies constituted 11% each out of the 54 papers. Lastly, the most applied duration was 9 to 24 weeks, followed by studies that engaged participants between 5 to 8 weeks, and the third most applied duration was 2 to 4 weeks. Few studies engaged participants for either less than a day, 1 to 7 days, or more than 24 weeks. Concerning the choice of language for communication among group members, the majority of the analysed literature papers adopted the English language as the language for cross-cultural collaborative learning. Studies that used both the native language and English language were found to be experimental, comparing the same culture versus mixed culture groups. Few of the studies did not report the language used for communication. Only one study used Thai as the language for communication.

According to the findings in Table 11, in the most recent ten years, learning together increased by 100% by the end of the last five years, next was the project-based learning method, then mixed methods, and discussion. However, the use of games and problem-based learning decreased by 100% each. On the other hand, collaborative learning methods such as group investigation, project-based inquiry, and collaborative creation recently received attention. Regarding interaction methods, the asynchronous approach was applied twice as much in the second half of the ten years compared to the first five years. Likewise, synchronous methods increased in the recent past 5 years compared to the first five years in the analysed papers. Studies that used mixed interaction methods (synchronous and asynchronous) increased slightly in 2016 to 2020 compared to 2011 to 2015. The most widely used task type in the most recent 5 years of the 10 years' duration in terms of growth rate was issue discussion, then engineering or educational product design, and studies that utilized more than one task type. However, problem-solving and knowledge acquisition was less applied from 2011 to 2020.

According to the analysed papers, studies that employed interaction between students and teachers during cross-cultural collaborative learning increased by 120%, and student-to-student interaction slightly increased at a rate of 31.25% in 2016 to 2020 compared to 2011 to 2015. The use of mixed interaction tools such as audio calls or messages and video received much attention from 2016 to 2020 whereas video calls and text messages reduced.

Concerning teacher involvement, studies that did not employ teacher guidance increased by 200%, and teacher guidance increased slightly by 19.05%.

Table 10. Distribution of collaborative learning strategies applied over the past ten years.

Variable	Category	No. of Studies	Proportion of Studies
Collaborative learning method	Discussion	13	24%
	Team game	1	2%
	Group investigation	1	2%
	Learning together	3	5%
	Collaborative creation	2	4%
	Project-based inquiry	2	4%
	Project-based learning	5	9%
	Problem-based learning	1	2%
Interaction methods	Mixed	26	48%
	Synchronous	20	37%
	Asynchronous	3	5%
	Mixed	30	56%
	Not specific	1	2%
Collaborative learning Task types	Inquiry	2	4%
	Investigation	1	2%
	Issue discussion	15	27%
	Problem-solving	3	6%
	Engineering/educational product design	3	6%
	Knowledge acquisition	3	6%
	Mixed	27	50%
	Student-student	37	68%
Interaction types	Teacher-teacher	1	2%
	Mixed	16	30%
	Video calls	1	2%
Interaction tools	Audio messages	1	2%
	Text messages	13	24%
	Mixed	36	67%
	Not specific	3	5%
Teacher involvement	Teacher guidance	46	86%
	No guidance	4	7%
	Not specific	4	7%
	Scaffolding	6	11%
Intervention strategies	Collaborative scripts	41	76%
	Games	1	2%
	Mixed	6	11%
	Less than one day	7	13%
Duration	1–7 days	3	5%
	2–4 weeks	8	15%
	5–8 weeks	13	24%
	9–24 weeks	18	34%
	More than 24 weeks	2	4%
	Not specified	3	5%
	English	39	72%
Communication language	Mixed	11	20%
	Others (Thai)	1	2%
	Not specified	3	6%

Table 11. The growth rate of collaborative learning strategies applied from 2011 to 2020.

Variable	Category	2011–2015	2016–2020	Growth Rate
Collaborative learning methods	Discussion	6	7	16.67%
	Team game	1	0	–100%
	Group investigation	0	1	NA
	Learning together	1	2	100%
	Collaborative creation	0	2	NA
	Project-based inquiry	0	2	NA
	Project-based learning	2	3	50%
	Problem-based learning	1	0	–100%
Interaction methods	Mixed	11	15	36.36%
	Synchronous	7	13	85.71%
	Asynchronous	1	2	100%
	Mixed	14	16	14.29%
	Not specific	0	1	NA
Collaborative learning task types	Inquiry	1	1	0
	Investigation	0	1	NA
	Issue discussion	5	10	100%
	Problem-solving	3	0	–100%
	Engineering/educational product design	1	2	100%
	Knowledge acquisition	2	1	–50%
	Mixed	10	17	70%
	Student-student	16	21	31.25%
Interaction types	Teacher-teacher	1	0	–100%
	Mixed	5	11	120%
	Video calls	1	0	–100%
Interaction tools	Audio messages	0	1	NA
	Text messages	10	3	–70%
	Mixed	11	25	127.27%
	Not specific	0	3	NA
Teacher involvement	Teacher guidance	21	25	19.05%
	No guidance	1	3	200%
	Not specific	0	4	NA
	Scaffolding	2	4	100%
Intervention strategies	Collaborative scripts	17	24	41.18%
	Games	1	0	–100%
	Mixed	2	4	100%
	Less than one day	2	5	150%
Duration	1–7 days	1	2	100%
	2–4 weeks	5	3	–40%
	5–8 weeks	3	10	233.33%
	9–24 weeks	8	10	25%
	More than 24 weeks	1	1	0
	Not specified	2	1	–50%
Communication language	English	15	24	60%
	Mixed	6	5	–16.67%
	Others (Thai)	0	1	NA
	Not Specified	0	3	NA

Furthermore, most studies employed collaborative scripts in 2016 to 2020 compared to the 2011 to 2015 intervention strategies. However, in terms of growth rate, scaffolding and mixed strategies increased more than collaborative scripts while the use of games decreased. Concerning the duration, 5 to 8 weeks surged at a rate of 233.33%. Studies that engaged students within a day increased by 150% in the second half of the ten years, followed by 9 to 24 weeks. In contrast, 2 to 4 weeks decreased, and the trend of not specifying the duration of cross-cultural activities also decreased from 2016 to 2020. Concerning the communication language, the results showed that there was an increase in the use of the English language. Last, only one study revealed interest in the Thai language in the year 2016.

4.6. Cross-Cultural Collaborative Learning Research Design

Table 12 shows that most studies were aimed at exploring more than one objective (mixed) which constituted 71% of the literature papers analysed. Concerning the research design, non-experimental designs such as case studies were widely used compared to true experiments and quasi-experiments. The qualitative analysis was widely employed, followed by studies that used a mixed approach, and lastly quantitative analysis methods.

Table 12. The proportion of cross-cultural collaborative learning research design over the past 10 years.

Variable	Category	No. of Studies	Proportion of Studies
Research purpose	Cross-cultural understanding	4	7%
	Cross-cultural communication	1	2%
	Cross-cultural learning content	1	2%
	Cross-cultural challenges	2	4%
	Cross-cultural competence	4	7%
	Effects of tools	4	7%
	Mixed	38	71%
Experimental design	True experimental design	8	15%
	Quasi-experimental design	4	7%
	Others	42	78%
Analysis methods	Quantitative	10	18%
	Qualitative	23	43%
	Quantitative and qualitative	21	39%

Table 13 shows that both cross-cultural understanding and cross-cultural competence surged by 200% in the second half of the ten years. On the other hand, cross-cultural communication and cross-cultural challenges were not explored from 2016 to 2020. Concerning experimental design, other research designs and true experimental designs increased whereas quasi-experimental design decreased in the second five years of 2011 to 2020. Furthermore, qualitative analysis was widely applied in the recent past five years compared to the initial five years of 2011 to 2020. Likewise, quantitative analysis slightly surged by 50% while mixed analysis methods (qualitative and quantitative) decreased by 9%.

Table 13. The growth rate of cross-cultural collaborative learning design in the past 10 years.

Variable	Category	2011–2015	2016–2020	Growth Rate
Research purpose	Cross-cultural understanding	1	3	200%
	Cross-cultural communication	1	0	–100%
	Cross-cultural learning content	0	1	NA
	Cross-cultural challenges	2	0	–100%
	Cross-cultural competence	1	3	200%
	Effects of tools	0	4	NA
	Mixed	17	21	23.53%
Experimental design	True experimental design	3	5	66.67%
	Quasi-experimental design	4	0	–100%
	Others	15	27	80%
Analysis methods	Quantitative	4	6	50%
	Qualitative	7	16	128.57%
	Quantitative and qualitative	11	10	–9.09%

5. Discussion

5.1. Discussion of the Main Findings

Over the most recent ten years, most cross-cultural collaborative learning researchers engaged learners at the postsecondary education level. This finding confirmed [22] that university campuses have become a conducive environment for promoting social interaction among students from different cultural backgrounds. More so, post-secondary education is seen as a stage to transitioning into the job market. However, the findings

reveal the neglect of engaging elementary, middle, high school, and working adults in cross-cultural collaborative learning activities. Furthermore, cross-cultural collaboration mostly engaged participants across countries, especially at the post-secondary education level. Cross-cultural collaborative learning studies involved participants from more than one cultural background. For instance, Oakley et al. [51] engaged participants in China which are in the East, and Australia which is considered a western country. This result indicated that most scholars preferred to engage participants across continents rather than across countries. Engaging participants from two countries was discovered as an increasing trend, although researchers are beginning to have an interest in engaging more than two countries. This is due to the internationalisation of colleges and universities and cross-country partnerships among universities. According to the findings, a small sample size was most preferred by researchers when designing cross-cultural collaborative learning. This confirms that a small sample size is easy to manage [45], although another reason could be that the number of students who registered in courses in which the published papers were used as a context was few. It should be noted that researchers began to show less interest in the medium to large sample sizes from 2016 to 2020.

Group size and member selection have been indicated as significant of collaborative learning [52]. Cross-cultural groups are formed to promote collaboration and provide participants with international experience although cross-cultural groups face challenges [53]. Group composition influences learners' recognition of collaborative learning activities and procedures [54]. From the findings, a small group was widely applied in different cross-cultural collaborative learning settings. This confirms the effectiveness of small-group learning methods in cross-cultural collaborative learning for improving cross-cultural competencies [55].

To promote cross-cultural collaborative learning, researchers and professional designers should carefully consider the learning environment [56]. A large proportion of the studies applied online learning during cross-cultural collaborative learning. The online learning environment is conducive for removing time differences and distance, which are sometimes barriers to learning, and creates an avenue for learners to interact and freely ask questions during lesson delivery [57]. This finding indicated that online learning plays a significant role in cross-cultural collaborative learning and is therefore a significant element. Likewise, a blended learning environment was also applied in cross-cultural collaborative learning, although it received less attention in the second half of the ten years. In addition, most researchers applied more than one hardware and software for different purposes. Technologies such as blogs, emails, social media, learning management systems, and other software such as Camtasia were used to facilitate cross-cultural collaborative learning [58,59].

Cross-cultural learning topics were mostly related to social science learning domains. Scholars who engaged learners in social science or social studies-related topics were interested in assessing learners' perceptions or mixed (e.g., learning perceptions and cross-cultural awareness). This finding was not far from expectation as the main goal of the cross-cultural collaboration is to promote cross-cultural competencies such as collaboration, cross-cultural awareness, and understanding. Learning content should be directed towards learners' needs [60]. Therefore, most cross-cultural collaborative learning studies involved learners and learning content related to their subject area. Activities were more about building learners' cross-cultural competencies and knowledge which are necessary for training students for sustainable development. A moderate number of studies engaged learners in science, engineering, and computer science-related activities. Engaging cross-cultural groups on science-related practical tasks in an online learning environment would require advanced technology resources, therefore most studies applied face-to-face or blended learning. Hence, learning content should be carefully considered when designing activities.

Educators preferred to apply more than one collaborative learning strategy in a cross-cultural context while a good number also preferred discussion. Other collaborative learning strategies are understudied which requires urgent attention. In instances where learners

did not know each other, social lounge and cultural orientation through self-introduction were included to encourage social presence [61,62]. Engaging students in collaborative creative activities where students from diverse cultural backgrounds collaborate to create and design has recently gained researchers' attention, and it is still at a prime stage. The project-based inquiry was also recently applied in 2018 [63] and 2019 [21]. Applying both synchronous and asynchronous interaction methods was deemed more effective by more than 50% of the studies. The synchronous interaction curbed the challenge of social loafing whereas asynchronous settings bridged the issues of time difference. The use of only asynchronous settings was not a preferred interaction method by most researchers. The reason could be due to findings from prior research that asynchronous communication interferes with collaborative goals and learning outcomes [64], with heterogeneous groups. In contrast, [65] found that Chinese learners preferred asynchronous communication to synchronous because it gave them a sense of community towards discussing, interacting, and sharing knowledge and ideas. Therefore, in a distance learning cross-cultural collaborative learning setting, cultural background, group composition, and learning environment are critical aspects to consider when deciding the interaction methods.

Furthermore, collaborative learning task types were mostly mixed tasks such as the discussion of issues related to a topic or problems and solving it. Engaging learners for mixed outcomes influenced mixed task types, interaction methods, and collaborative learning methods. Student-to-student and mixed (students and teachers or professionals) interaction were mainly preferred. Engaging teachers and students in cross-cultural collaborative learning activities guarantees cognitive, teaching, and social presence [62]. Applying more than one interaction tool (such as text messages and video calls) was highly effective and preferred by the majority of researchers when applying mixed interaction methods. In addition, to evaluate learning achievement as part of learning outcomes, text messages were found to be valuable and time-saving. Collaboration scripts were found to be highly significant as an intervention strategy for guiding students to collaborate in diverse cultural groups. Although scaffolding gained moderate attention, it increased in the second half of 2011 to 2020. Researchers have begun to explore the potentials and effectiveness of scaffolding in cross-cultural collaborative learning activities. Teachers only acted as guiders without telling students directly what to do during activities [66]. Groups were formed under teacher guidance which influenced the group size, and group composition, although group heterogeneity was also influenced by several participants from the participating countries. It was surprising to find that a number of the analysed papers did not report on a team hierarchy. For instance, [15] reported that students were given the liberty to assume the leadership preference that is, by choosing someone, by themselves, or not. Conversely, few studies such as Yang and colleagues [62] established a team hierarchy by assigning one group member as a project leader. Surprisingly, few studies by Shi et al. [16] and Hur et al. [21] discovered cross-cultural groups assumed team hierarchies, roles, or structures without teacher guidance. However, studies such as Gu et al. [15] and Dodd et al. [67] included role assignment or role-play. Most researchers applied a medium (5 to 8 weeks) to long (9 to 24 weeks) period of study. This finding is supported by Aguanta and Tan [68] who posited that a longer duration of intervention could be a great factor to improve learners' attitudes and effective implementation of intervention methods. Another reason is that most of the studies were conducted during a school course or subject which could take a whole semester. The English language was commonly used for communication in most cross-cultural collaborative learning studies. The reason could be that the English language is widely spoken and international [69]. Most of the studies engaged countries with different languages but have the English language in common as a tool for communication. Therefore, the ability to communicate in the English language is seen as a global competence in organizations and different countries [70]. Conversely, [71] engaged students from Thailand and Cambodia to collaborate using the Thai language for communication. This was effective because both countries share a cultural history in terms

of language. This finding indicated that the communication language for cross-cultural collaboration should carefully be considered during activity design.

Almost all the cross-cultural collaborative learning studies were targeted at more than one research objective. For instance, Puteh and colleagues engaged Malaysian and UK students in an online learning setting with the objective of improving their communication skills and promoting knowledge sharing [72]. The finding indicated that cross-cultural collaborative learning activities are not targeted at one competence. Therefore, to prepare learners to be global citizens for sustainability, different approaches were considered [73]. Concerning research designs, experimental designs were understudied. It must be noted that quasi-experimental design has not been applied over the past five years which indicated a decline in interest. The reason is that most of the studies did not manipulate variables [74]. Studies that used neither true-experimental design nor quasi-experimental design preferred using both qualitative and quantitative analysis methods or purely qualitative.

It should be noted that major challenges such as technology glitches, time difference [75], language barriers [76,77], different expectations and perceptions were discovered. To illustrate, Oakley and colleagues [50] reported that students experienced challenges with the platform for collaborative learning, and Chinese students did not recognize digital content with copyrights nor acknowledge sources. Organising cross-cultural group meetings across time zones can be challenging [78]. Wang [27] also discovered the language barrier as the major challenge aside from time difference, whereby American students do not understand the Chinese language and Chinese students had limited English language comprehension. These challenges affected intercultural dialogue and social interaction among team members [57]. Language is a means for communication that involves sharing ideas and opinions, information, and feelings [79]. Therefore, the language barrier could hinder or delay collaborative activities. MacLeod and co-authors [24] reported that the difference in perceptions of social interdependence among students was a challenge among diverse cultural teams. That is, Chinese students expected to have a dialogue about other topics and socialize more rather than being task-oriented but found their American counterparts were more focused on the task which affected their intrinsic motivation negatively. However, cultural differences according to Chang and Benson [80] positively influenced both individual and group learning, and social connectedness.

5.2. Implications

This study discovered interesting findings for the research area through a systematic review of cross-cultural collaborative learning. It reveals the current status of cross-cultural collaborative learning research over the past decade. The findings confirmed the effectiveness of cross-cultural collaborative learning in promoting not only cross-cultural communication but cross-cultural understanding, awareness, problem-solving skills, and professional development. However, it requires critical considerations and much effort to be implemented.

First, based on the findings, it is recommended that researchers involve more elementary, middle, high school level learners, and working adults in cross-cultural collaborative learning activities. A suggestion is to engage learners from southern cultures such as from African countries with other cultures.

Second, detailed information on group composition should be clearly stated. Information on how groups are structured during cross-cultural collaborative learning should be carefully considered and reported in future studies. Future studies should explore more science, technology, engineering, and mathematics activities in cross-cultural collaborative learning activities.

Third, there is a requisite to explore different learning environments by comparing which is more effective. More so, the relationship between learning environment, learning content or domain for learning achievement, and cross-cultural communication competence are unknown. Although cross-cultural collaborative learning has been confirmed to

contribute to the development of necessary skills and knowledge for 21st century skills, none of the analysed papers explored how knowledge is converged, elaborated, and the social processes that lead to knowledge building and creativity. Therefore, future studies would need to explore this area.

Fourth, it is recommended that the languages used for communication during cross-cultural collaborative learning and the challenges they pose for cross-cultural teams should be reported in future studies. Further studies to explore the major challenges that are likely to hinder cross-cultural collaboration and the possible effects of team hierarchies during cross-cultural collaborative learning will be rewarding to the research area. Technological interventions can be explored to reduce the effects of the language barrier.

Last, this systematic review proposed a framework based on the existing scholarly works and adopted it for the analysis of the selected literature papers. The proposed conceptual framework could be adopted by future researchers and educators to design cross-cultural collaborative learning activities. The conceptual framework brings together elements of different approaches and stages for successful cross-cultural collaborative learning that have been suggested by experts in the research area. Despite the extended studies on cross-cultural collaboration, this study, through the proposed framework, summarized different significant components and characteristics of cross-cultural collaborative learning over the past decade.

6. Conclusions

This comprehensive review of cross-cultural collaborative learning literature from 2011 to 2020 sheds more light on the essential elements to consider in the design and planning, implementation, and analysis of cross-cultural collaborative learning. A major contribution was that rich information through in-depth analysis of the significant aspects was discovered to have an impact on the current status and driving objectives for cross-cultural collaborative learning. Another significant contribution is that this study revealed the different variables that researchers and educators need to consider to sustain students' global competence through cross-cultural collaborative learning. However, the findings cannot be generalized because the selected papers were sourced from three databases. Future studies will expand to more data sources such as Google Scholar and EBSCOhost. In addition, experimental research with other technological interventions such as AI-enabled software will be further explored. Last, although this study discussed findings on the group hierarchies and challenges that cross-cultural teams encounter, in-depth analysis is recommended. Therefore, future studies will delve into this area.

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