ECNU Review of Education
2022, Vol. 5(1) 185–206

DOI: 10.1177/20965311211006721
journals.sagepub.com/home/roe

How Cooperative Learning Is Conceptualized and Implemented in Chinese Physical Education: A Systematic Review of Literature

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Abstract

Purpose: The purpose of this literature review was to investigate how cooperative learning (CL) has been conceptualized and implemented in Chinese physical education (PE). CL is one of the most influential and widespread areas of theory, research, and practice in western education. With the promotion of Chinese government policies, CL has become a popular field of research and was widely used as a pedagogical practice in Chinese.

Design/Approach/Methods: Shulruf's five methodological steps were utilized as the process of screening and selecting relevant studies. Inductive analysis and constant comparison were conducted for analyzing the chosen literature.

Findings: The analytic induction revealed four key themes: (a) historical development, (b) policy influence, (c) conceptualization of CL, and (d) implementation of CL. We found that the

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conceptualization of CL in Chinese PE was ambiguous, and the implementation of CL was predominantly documented by quantitative research methods. In addition, few studies were conducted at the elementary school level.

Originality/Value: This is a comprehensive literature review on CL in Chinese PE. Findings and recommendations in this article will be beneficial for policymakers, scholars, and PE teachers to better understand and promote CL in China.

Keywords

Chinese physical education, cooperative learning, education, systematic literature review

Date received: 16 May 2020; revised: 1 January 2021, 9 March 2021; accepted: 12 March 2021

Introduction

Cooperative learning (CL) was developed as a pedagogical practice in the United States during the 1970s amid concerns that students rarely had the opportunity to develop interpersonal and emotional skills in traditional and competitive school environments (Johnson & Johnson, 2009; Kagan & Kagan, 2009; Slavin, 1995, 1996). CL has been defined as a dynamic pedagogical practice that can teach diverse content to students at different grade levels in physical education (PE) (Casey & Goodyear, 2015). In a cooperative PE class, students could work together in small, structured, and heterogeneous groups to complete group tasks (Dyson, 2001). While there are various teaching structures in CL (e.g., Learning Team, Pair-Check-Perform, and Jigsaw), five essential elements are recommended by Johnson and Johnson (1989) to fully implement CL: positive interdependence, individual accountability, promotive face-to-face interaction, interpersonal and small group skills, and group processing (Dyson et al., 2016). A considerable number of studies have indicated the efficacy of CL in PE (Barrett, 2005; Dyson et al., 2004; Metzler, 2005; Metzler & McCullick, 2008). To further identify the impacts of CL in PE on students' learning, Casey and Goodyear (2015) conducted a systematic literature review. Their findings provided substantial evidence that CL could improve students' achievement of learning in physical, cognitive, social, and emotional domains. Students instructed by CL not only are responsible for their own behaviors but also help other group members to learn and achieve.

This review examined the conceptualization and implementation of CL in Chinese PE through the lens of social constructivism theory (Vygotsky, 1978). Many researchers (Antil et al., 1998; Cohen & Lotan, 1997; Dyson et al., 2004; Dyson & Casey, 2012; Perkins, 1999) have made the connections between CL and social constructivism theory. Social constructivists believe that learning is a social process and can only be achieved through reciprocal teaching, peer collaboration, cognitive apprenticeships, problem-based instruction, anchored instruction, and other

methods that involve interactions with others (Shunk, 2000). The tenet of this theoretical framework is on the discoveries of an engaged, active, and creative learner (Rovegno & Dolly, 2006). The implementation of CL has been proven a perfect match with this tenet (Perkins, 1999). In CL, students are guided to discover knowledge through tasks that stimulate decision making, critical thinking, and problem-solving, which empower them to construct knowledge through social interactions with peers and teachers. It is clear that CL is rooted in social constructivism theory in that CL articulates learning is an inherently social process in which individuals make sense of information and construct new knowledge through activity and social interactions in everyday contexts (Vygotsky, 1978). This notion is congruent with the claim proposed by Cohen and Lotan (1997), "Constructivists almost unanimously recommend small cooperative groups as settings in which students have the opportunity for such discourse" (p. 42). The theoretical perspective of social constructivism provides an in-depth understanding of CL, which facilitates the examination of relevant studies on CL in Chinese PE.

Although "cooperative learning methods are among the most extensively evaluated alternatives to traditional instruction in schools" (Slavin, 1991, p. 75), their uptake by teachers has been inconsistent. Many PE teachers have utilized collaborative activities, competitive games, or some elements of CL in their PE programs. However, few of them have implemented CL with applaudable fidelity (Dyson, 2001). Teachers mistakenly believe that as long as students work in teams, the activities should be considered cooperative. However, those activities may just be collaborative in practice, and often games are too competitive to be cooperative.

Based on the China National Knowledge Infrastructure (CNKI) database, CL was first introduced to China in 1982 (Fu, 1982). Since then, it has become a popular area of research for Chinese scholars and practitioners across subjects in schools. CL was promoted as an innovative pedagogical practice to schools by the Chinese State Council (CSC, 1999, 2001, 2010) and the Chinese Ministry of Education (CMOE, 2014), which led to a blowout of theoretical and experimental studies on CL in Chinese schools. Although there have been numerous studies on CL in Chinese PE, basic concepts, essential elements, and structures pertinent to the conceptualization and the implementation of CL are still ambiguous, and those issues need to be further addressed and clarified (Liu, 2007; Xie & Zhao, 2012). In addition, due to the competency of university teachers as researchers and the belief that only adult students are suitable for CL-based activities, many studies on CL were conducted in Chinese universities as opposed to the school system (Bao, 2008; Dang, 2017).

With this in mind, the purpose of this literature review was to investigate how CL has been conceptualized and implemented in Chinese PE, searching for a common ground understanding of how we can better implement CL in PE from an international perspective. This systematic review

was based on Shulruf's (2010) five methodological steps to examine relevant studies within their findings reported on CL in Chinese PE.

Methodology of review

Shulruf (2010) articulated that any systematic literature review should "examine the material pertaining to a particular area" (p. 596). The focal point for a systematic literature review is the researchers' control of potential methodological biases (Shulruf, 2010). To conduct a systematic literature review on both empirical and theoretical studies pertaining to the conceptualization and implementation of CL in Chinese PE, Shulruf's (2010) five methodological steps were employed for data collection and analysis. This approach draws synthesis from the findings while acknowledging and accounting for researcher bias (Boaz et al., 2002). The first four steps were used as a criterion for deciding the inclusion and exclusion of the studies. The last step was utilized as the process for analyzing the eligible studies.

1. *Focus on a specific question*: The specific question for this article is, "How has cooperative learning been conceptualized and implemented in Chinese PE?"
2. *Use a protocol to guide and plan the processes to be followed*: The basis of this article is a consideration of peer-reviewed journals, master's theses, and doctoral dissertations that are specific to CL in Chinese PE settings. Given the limited number of CL literature in Chinese PE, a small number of evidence-based and school-based master's theses and doctoral dissertations about the implementation of CL are considered for this review of the literature. The literature reviewed in this article includes theoretical and empirical studies covering elementary schools up to universities in China.
3. *Identify as much of the relevant literature as possible through a comprehensive search*: Literature was sourced through the Scopus, CNKI, and Wan Fang Date Service Platform, which are the three well-recognized databases of peer-reviewed literature, dissertations, and theses in China. The literature search process was conducted with the keywords "cooperative learning," "physical education," and "physical activity." An additional keyword, "China," was used for the Scopus database. Since the Chinese Basic Education Curriculum Reform highlighting the implementation of CL in schools started in 2001, the time range was set from 2001 to 2020. Seventy-six peer-reviewed articles satisfied the search criteria. For master's theses and doctoral dissertations, a timeline from 2000 to 2020 was set, returning 424 and 15 results, respectively. Further journal articles were obtained through the citations and references in the originally discovered documents.
4. *Make decisions about the inclusion and exclusion of studies based on methodological criteria*: The studies contained within the present review were theoretically and

empirically based on peer-reviewed journals, master's theses, and doctoral dissertations written in Chinese. Studies were excluded if (a) the article did not contain the fundamental elements of CL and/or reference to CL Structures used (e.g., typical CL Structures are Think-Pair-Perform, Jigsaw, Learning Team, Teams-Games-Tournament, etc.). The fundamental CL elements or CL Structures absent either in the abstract or in the keywords section were considered weak or irrelevant to this literature review and were excluded from the review list; (b) studies reported on collaborative learning (students only working in group study) rather than CL were also excluded. Collaborative learning did not emphasize the five fundamental elements: positive interdependence, individual accountability, interpersonal and small group skills, promotion interaction, and group processing. In our review, we distinguish between collaborative learning and CL as a different pedagogical model. Abstracts of those preliminary articles were initially read to examine whether they met the inclusion or exclusion criteria. Finally, 45 peer-reviewed articles, 7 master's theses, and 3 doctoral dissertations were eligible for this systematic literature review.

5. *Synthesis of research findings and being explicit and transparent:* All the 55 works were imported into NVivo 12 plus, followed by a systematic process of inductive analysis and constant comparison for the data analysis (Miles et al., 2014). Each study was read to confirm its initial inclusion in the review. Once this was completed, each work was independently read again and coded "to make the task of analysis more straightforward by sifting relevant material from a large body [of writing]" (Potter, 2009, p. 615). Descriptive coding was employed first. Descriptive coding is the process of assigning labels to statements or events in the data and summarizing them in a word or short phrase (Miles et al., 2014). Descriptive coding formed the first cycle of data analysis, which produced nodes or thematic descriptions from the data. The second stage of analysis involved pattern coding, which aimed to identify conceptual links, discover relationships among categories, and generate themes by constant comparison and triangulation (Miles et al., 2014).

The analytic induction of the 55 papers revealed four key findings/themes: (a) historical development, (b) policy influence, (c) conceptualization of CL, and (d) implementation of CL. In the following Findings section, we present themes found in the review of the literature. In the Discussion section, we focused on an in-depth understanding of those findings. We tried to identify factors that might influence the conceptualization and implementation of CL in Chinese PE. In the Future recommendations section, we provide suggestions for Chinese policymakers, scholars, and PE teachers to better promote and implement CL in Chinese PE.

Findings

The findings in this review of the literature regarding the conceptualization and implementation of CL in Chinese PE can be organized into four themes: (a) historical development of CL, (b) policy influence, (c) conceptualization of CL, and (d) implementation of CL.

Historical development of CL

CL was introduced to China in 1982 in pursuit of an alternative to traditional teacher-driven instruction. The title of the first Chinese journal about CL was *About Cooperative Learning* (Fu, 1982). In Chinese PE, the first peer-reviewed journal was written in 1997, entitled *A Probe into the Teaching Model of Cooperative Learning* (Wang et al., 1997). Along with the educational reforms in general education and PE, a large number of theoretical and empirical studies were conducted on CL, making it a trendy research area in China for more than 20 years. The development of the study on CL in China can be generally divided into three phases (Liu, 2009): the embryonic stage, the dependent development stage, and the independent development stage.

The embryonic stage covered the period from 1982 to 1992. During this period, earlier western research articles introducing concepts and efficacy of CL were translated and introduced to China. Sheng's (1990) and Wang's (1991) investigations on the rise of CL in American school settings provided preliminary theoretical insights into CL, articulating the necessity of learning and adopting CL as an innovative pedagogical practice in Chinese schools.

The dependent development stage was considered a time frame covered from 1993 to 2001 (Liu, 2009). During this period, Chinese researchers began to conduct empirical studies on CL in schools depending on the theories developed by western scholars. A salient research project on CL conducted by Wang T. from 1993 to 1999 investigated the efficacy of CL with "more than 100 elementary and middle schools across 9 provinces in China," which accelerated the promotion of CL in Chinese schools and led to an "significantly increased number of empirical and theoretical explorations on CL" in China (Liu, 2009, p. 51). At this period, not only researchers and practitioners showed interest in CL but also educational and research organizations started to study CL with collaborated efforts and resources. Universities and institutions in China established research labs aiming to adopt western theories, concepts, and principles of CL into Chinese school settings. Representative research labs in China include *Exploration of personality optimization education* in Hangzhou University, *Cooperation Teaching Research and Implementation* in Shandong Educational Science Research Institute, and *Cooperative Learning Laboratory* at Hunan Normal University. As the CL research community grew larger, a considerable number of evidence-based studies were carried out in this period (Pei, 2000; Sheng & Zheng, 2003; Wang, 1997, 1999).

The independent development stage began in 2002 and continues to the present. The *Deepening Educational Reform and Comprehensively Promoting Quality Education* policy released by the

CSC in 1999 and its following explanatory statement in 2001 are recognized as benchmarks for the pervasive promotion of CL in Chinese schools (CSC, 1999, 2001). Based on the promotion of these national policies, provinces and cities in China started to initiate curricular and pedagogical reforms, which provided positive contexts for the studies of CL to flourish. Consequently, CL was accepted by teachers as a pedagogical practice in their classrooms (Liu, 2009). Since 2001, theoretical studies (Bao, 2008; Dang, 2017; Dong, 2005; Jiang & Tan, 2011; Liu, 2007, 2009; Wang, 2002, 2005; Xie & Zhao, 2012) and empirical studies (Chen, 2006; Chu, 2010; Guan, 2015; Hu, 2004; Liu, 2015; Liu & Wang, 2005; Luo, 2012; Mou, 2017; Zhang, 2009; Zhang G., 2015) have been published more than ever.

Policy influence

Yan and Wang (2018) reported that the "education system in China is managed under the unified leadership under the central government" (p. 12). The reason why CL is proliferating in the Chinese school system is attributed to the education reform policies promoted by the Chinese government. To be specific, four government policies have played critical roles in the promotion of CL in China. The first policy was released in 1999, as the CSC announced the policy of "*Deepening Educational Reform and Comprehensively Promoting Quality Education*." The policy asked for "an active implementation of heuristic and discussion-based teaching module" and "attached importance to developing students' ability to work cooperatively and enhancing their social skills" (CSC, 1999, p. 2). Two years later, in 2001, the CSC announced another act named "*Decisions on the Reform and Development of Basic Education*," which reinforced the 1999 policy and encouraged teachers using CL as a pedagogical practice to promote "mutual exchanges and common development among students" and create "a new relationship between teachers and students" (CSC, 2001, p. 5). The educational policy in 2001 elicited a significant number of theoretical and empirical studies, which resulted in wide acceptance of CL as a pedagogical practice among teachers in Chinese schools. Another significant policy was the "*National Program for Medium and Long-Term Educational Reform and Development 2010-2020*," released by the CSC in 2010. The new educational policy encouraged teachers to employ "heuristic, inquisitive, discussion, and participatory" pedagogical approaches in their classrooms (CSC, 2010, p. 15). In 2014, to better implement the educational reform policies issued by the CSC, the CMOE announced the administrative rules of "*Comprehensively Deepening Curriculum Reform and Implementing the Fundamental Tasks of Whole Person Education*" (CMOE, 2014). The administrative rules articulated that the cultivation of students' talents should be "further deepened, while the self-regulated learning, cooperative learning, and inquiry learning approaches should be encouraged and promoted" (CMOE, 2014, p. 2).

For the past 30 years, along with the promotion of government policies, CL has been intensively studied as an innovative pedagogy in schools, especially universities. Liu's (2007) extensive meta-analysis on 2,737 articles published between 1979 and 2006 found a significant increase of interest in CL research from 2001 to 2007, with the numbers of studies growing from 66 to 676. Another meta-analysis of Chinese literature about CL reviewed 52 doctoral dissertations between 1998 and 2017 (Xie & Zhao, 2012). In line with Liu's (2007) work, Xie and Zhao (2012) found a dramatic increase in the number of dissertations on CL after 2001, following the policy of "*Decision on the Reform and Development of Basic Education*" (CSC, 2001). In particular, more empirical CL studies were published in China after 2001 (Xie & Zhao, 2012). Xie and Zhao (2012) also found that previous studies on CL were mainly focused on the university level rather than the elementary or middle school level. Therefore, they suggested more CL research should be conducted in the elementary or middle schools in China.

Conceptualization of CL

Conceptualizing CL in Chinese general education and PE. Chinese scholars use different definitions, terminologies, and statements to conceptualize CL in both general education and PE. In China, terminologies commonly used as alternatives of CL include "collaborative learning," "cooperative teaching," and "group learning" (Dang, 2017). Chinese scholars also conceptualize CL in different ways and from different perspectives.

In general education, Wang (2002) defined CL as "a teaching activity which achieves teaching objectives by heterogeneously grouping students and systematical utilizing the dynamic factors inherited in teaching activities to promote the students' learning outcomes," and the "evaluation focuses on group performance more than individual performance" (p. 32). Wang (1992) also pointed out that CL was based on group learning, which was combined with cooperative procedures and methods, aiming to improve students' cognitive and emotional skills. Li and Sun (2001) summarized that "cooperative learning is a teaching activity of which group learning is addressed and group performance is considered as the main evaluation indicator" and that these "interactions between teachers and students are essential to achieve the learning outcomes" (p. 1).

Although Chinese scholars have different conceptualizations of CL in the field of general education, the shared beliefs are (a) CL is built on group learning; (b) each member in the group has the same goal; and (c) group success depends on everyone's contribution, which emphasized the necessity of positive interdependence, which is one of the key elements of CL.

The conceptualization of CL for general education and empirical studies also extended to Chinese PE contexts. Li and Yu (2005) conceptualized CL in PE as "an interactive learning process that makes a balanced improvement between cognition, motor skill, emotion, and social

adaptation" (p. 84). They further explained that CL could mitigate the tensions of the mismatch between the students' learning interest and the course content in PE. Therefore, by using CL in PE, the teacher–student relationship could be improved. Ma and Chang (2010) recognized CL as an innovative pedagogy in PE that was "based on psychological and pedagogical theories." They stated that CL "involved heterogeneous grouping, moderate competition, scientific grading and evaluation, and can dramatically improve students' motor, social, and mental skills" (p. 106). Wei and Wu (2008) interpreted CL in PE as a group activity in which "the evaluation of the group performance is depended on each member's performance" (p. 14). They further addressed that CL can effectively elicit students' interactions and meet students' psychological and social needs in PE. Hu (2007) pointed out that the main characteristic of CL is small group work. Based on the learning task, PE teachers should heterogeneously assign two to four students in each learning team.

The shared conceptualizations and understandings of CL in Chinese PE are (a) students need to work in heterogeneously small groups; (b) team success in physical activities is based on each member's achievement; and (c) conducting CL in PE can lead to students' physical, cognitive, social, and emotional improvements.

Conceptualization of the CL key elements. Understanding key elements of CL is critical for the fidelity of the implementation. Pei (2000) addressed that there were three key elements for effective implementation of CL: (a) equal experiences of each group member, (b) each group member has a common task to complete, and (c) group members should have cooperative awareness and cooperative skills. In PE, Ma and Chang (2010) believed that the key elements of CL should be (a) interdependence between group members, (b) individual accountability, (c) interpersonal and social skills, (d) cooperative activities for groups, and (e) multiple evaluations and feedback. Wang (2002) cited Johnson and Johnson's (2009) definition of the five key elements in CL, which were promoted in Western education by Dyson (2001) as (a) positive interdependence, (b) promotive face-to-face interaction, (c) individual accountability, (d) interpersonal and social skills, and (e) group processing. Johnson and Johnson's (2009) five elements of CL have been widely accepted in China.

The most critical elements in CL reported by Chinese scholars were interdependence, individual accountability, and interpersonal and social skills. However, there is an overlook of group processing in the reviewed Chinese papers. This issue is in line with the finding of Dyson & Rubin (2003) work, where the authors addressed the neglection of group processing in his study and attributed this issue "due to time considerations" from the PE teachers in the classes (p. 50). Group processing is one of the most important tools in CL as it can be utilized by teachers "to encourage a more student-driven learning environment" (Dyson et al., 2016, p. 376), which is the core

objective of using CL in PE. More works should be done to fully understand the value and process of implementing group processing in the Chinese PE context.

Implementation of CL

Using CL in Chinese PE. A large number of empirical studies in Chinese PE have compared CL with the traditional teacher-driven pedagogy. Evidence has shown that students taught by CL have more cognitive, motor skills, social and emotional gains than those guided by teacher-driven instructions. CL, as a student-centered pedagogical approach, has been used to teach many sports and physical activities in Chinese PE, including soccer (Zhang, 2002), basketball (Chu, 2010; Guan, 2015; Ye, 2018), volleyball (Zhang, 2009), gymnastics (Luo, 2012; Zhang, 2015), Chinese martial arts (Chen, 2006; Dang, 2017; Liu, 1998), calisthenics (Wang et al., 2006), track and field (Mou, 2017), Chinese Tai Chi (Chen et al., 2003), swimming (Guo, 2007), table tennis (Zhou & Xing, 2016), tennis (Tang & Li, 2013), sports dance (Tan & Xia, 2013), and badminton (Liu, 2015).

Studies of using CL-based sports activities in Chinese PE have demonstrated positive students' learning outcomes in sports skills, sports knowledge, and interpersonal skills. For example, Zhang (2002) studied the impact of CL on university preservice PE students' learning outcomes in soccer classes. Compared to the control group, students in the intervention group instructed by CL-based activities demonstrated a higher level of motivation, cooperation, and interest in the class and achieved better learning outcomes in soccer skills. Using CL in basketball classes in two universities and one middle school, Chu (2010), Guan (2015), and Ye (2018) found students enjoyed the CL-based learning activities and were more motivated and engaged in the classes. Students in the experimental group achieved better learning outcomes in basketball skill performance and demonstrated the enhanced willingness and social skills of cooperating with other students in the basketball practices. Especially, Ye's (2018) study found that the use of CL in PE led to a significant improvement in the students' learning motivation, but little difference was found in students' physical fitness performance. Zhang (2009) utilized the experimental design to study the impact of CL in a normal university volleyball class for preservice PE students. Findings in this study indicated significantly positive learning effects in volleyball basic skills and knowledge. Zhang (2009) also accentuated that teachers must address the key points of CL before the start of the class, emphasizing trust and respect. In a tennis-based CL study, along with positive findings in students' tennis skills and interpersonal skills, Tang and Li (2013) recognized the lack of time and space for students to better understand and practice CL-based activities in the tennis class and called for extracurricular CL-based practices to better prepare students for the tennis class. Based on an experimental research design, Tan and Xia (2013) studied the implementation of CL in a university sports dance class. The study found an increase in self-confidence, willingness to

cooperate with others, and improved interpersonal skills among the students, which facilitated the teaching effectiveness for the sports dance class. Wang et al.'s (2006) study used repeated measure design to identify the impact of using CL in calisthenics classes with more than 100 university students. The results showed that CL, compared with traditional teacher-driven practices, significantly improved students' motor skills and had a significant impact on students' motivation to learn (Wang et al., 2006). This study also indicated that the strategy of heterogeneous grouping elicited students' caring and helping in the physical activities and empowered students to achieve their full potentials in the classes. Liu (1998) studied how CL was implemented in Chinese martial arts classes in a university setting. He concluded that the implementation of CL in PE should include five main steps: (a) class design and preparation, (b) collective teaching and learning, (c) group work, (d) class assessment, and (e) modification. By using a repeated-measure design, he also reported that CL significantly influenced students' learning interests, motivation, and affection in PE, articulating that it was feasible and worthwhile to employ CL in university PE classes.

Other studies investigating CL-based physical activities in Chinese PE also indicated positive students' learning outcomes, especially in the emotional domain. For example, compared to university students' learning outcomes in three different PE classes, Li and Sun (2001) found that physical activities based on CL could elicit better students' learning outcomes in skill performance and interpersonal skills than teacher-driven pedagogical practices. They found that in CL-based PE classes, students were positively and actively empowered and engaged in physical activities. He (2008) studied CL in PE in three Chinese universities in Hunan province with 104 students and found that students' confidence, interpersonal skills, and motivation were significantly improved. He (2008) also stressed that CL was more meaningful to meet the students' psychological needs, suggesting that CL should be introduced to preservice PE teachers in teacher education programs. Qiu et al. (2015) examined the efficacy of CL in PE with 101 third-grade Chinese students in Kunming city. Qiu et al. (2015) reported that after the implementation of CL in PE, students in the experimental group performed a significantly higher level of emotional stability and satisfaction than students in the control group, concluding that CL could help maintain students' mental wellness.

This large body of research regarding teaching sports and physical activities in Chinese PE has justified the efficacy of CL, providing solid evidence that CL can significantly improve students' learning outcomes in technical, cognitive, social, and emotional domains. From these representative empirical studies of CL in PE, it could be summarized that (a) the coverage of empirical studies on CL in Chinese PE ranges from elementary school to university, (b) CL has been implemented in a variety of sports and physical activities in Chinese PE. Findings in these studies suggested that CL achieved better learning outcomes in Chinese PE than traditional teacher-driven approaches.

Using CL Structures in Chinese PE. Previous studies have reported the efficacy of CL in Chinese PE. However, "without reviewing the research on the different cooperative learning methods [CL Structures], it is difficult to recommend specific cooperative learning procedures to educators" (Johnson et al., 2000, p. 12). CL Structures are essential in that they can help and guide PE teachers to use CL with higher fidelity in PE activities. CL Structures can be defined as teaching methods that employ strategies for organizing teaching content and promoting students' social interaction in a classroom or education setting (Kagan, 1989). CL Structures also could be regarded as methods of arranging students for cooperation, which are content-free and serve as instructional guides and frameworks for lessons (Dyson, 2001). Commonly used CL Structures in western PE classes are Think-Share-Perform, Pairs-Check-Perform, Jigsaw Perform, Co-op Play, and Learning Teams (Dyson, 2001).

Xiong et al. (2008) identified that the main CL Structures that fit in PE were *Think-Pair-Perform*, *Jigsaw*, and *Learning Team*. Given that students were different in age, gender, and motor skill, their learning ability and the awareness of cooperation would be different. The authors suggested that different CL Structures should be used based on actual educational contexts (Xiong et al., 2008). Wei and Wu (2008) applied the CL Structure of *Students Team Achievement Divisions (STAD)* in university PE classes and found that CL significantly improved university students' social adaptability and interpersonal relationship, especially for students who had a lower ranking in PE before the intervention. In another CL study in a university setting, Chu (2010) utilized *STAD* and *Team Games Tournaments* in basketball classes, where students were randomly assigned into the experimental group and the control group and were tested on dribbling, set shots, 1,000-m run, 100-m run, and their interest of learning. After 16 weeks, based on comparing the test results, Chu (2010) reported that the use of CL Structures significantly enhanced students' learning interest and improved their motor skills and fitness performances. In an effort to guide PE teachers' use of CL, another study conducted in Shenyang Sports University with 130 students proposed four-phase procedures for implementing CL in PE: (a) design phase, (b) implementation phase, (c) feedback phase, and (d) revision phase (Zhang, 2009).

Although there were many empirical examples of research on CL in Chinese PE settings, the research on CL Structures was still limited. With the overwhelmed quantitative data and the ambiguity of the detailed description of how the CL Structures were implemented, PE teachers might feel challenging to reproduce and follow these CL Structures in their classrooms.

Assessment in CL-based PE class. Assessment in CL-based PE class also emerged as a salient subtheme in this review of the literature. Bao (2008) pointed out that the assessment of students' learning outcomes in CL-based PE classes should be administrated on both individual level and group level. In addition, the assessment should focus not only on students' academic performance

but also on the developmental process of learning. Later, Zhang W. (2015) investigated the assessment of students' performance in PE by surveying 635 Chinese elementary and middle school PE teachers. The survey indicated that 81% (515) of the PE teachers thought that it was imperative to assess students' interpersonal and small group skills. However, more than 30% (195) of the PE teachers had never really assessed students' interpersonal and small group skills in their PE classes even though most of them recognized the necessity. The study also pointed out that only 20% (127) of the PE teachers were confident in their ability to implement assessments on students' interpersonal and small group skills in PE (Zhang W., 2015). The PE teachers' deficiency of methods and motivation in assessing students' interpersonal and small group skills might impede their understanding of the value in CL and perhaps might prevent them from using CL in their classes.

Discussion

The purpose of this study was to investigate how CL has been conceptualized and implemented in PE in China. In our review of the literature on CL, Chinese scholars have tried to conceptualize CL with different definitions, terminologies, and statements. However, these conceptualizations fail to provide a comprehensive understanding of CL. The key elements of CL, the sociocultural contexts, and the benefits of using CL are not presented as a whole to communicate the intrinsic characteristics and values of CL. As suggested by Johnson and Johnson (2009), key elements of CL should be considered as a guiding framework for teachers seeking to use CL in any teaching context. Therefore, most of the key elements of CL should be presented in the definition. Since we come from a social constructivism theory perspective (Vygotsky, 1978), it is important that the definition should address the sociocultural contexts in which the CL practices are embedded. Also, the definition should include the impact of CL on students' overall development so that teachers can better understand the value of CL in PE. Based on these considerations, an excellent example of the definition of CL in PE, proposed by Dyson et al. (2012), is presented as follows:

> A pedagogical model that, through its five elements, explores the social-cultural significance of the human movement through the use of individual and group learning outcomes to enhance student development, interaction, and task-mastery within the physical, cognitive and affective domains. (p. 284)

This definition provides a more comprehensive conceptualization of CL in PE, including its key elements, the nature of the activity, and its envisioned benefits. A complete and precise definition will help guide teachers to better conceptualize and implement CL in PE.

As argued by Johnson et al. (2000), without reviewing the research on the different CL Structures, it is difficult to recommend specific CL procedures to teachers. CL Structures could

be regarded as methods of arranging students for interaction, which are content-free and serve as an instructional framework for lessons (Dyson, 2001). Although many Chinese researchers and teachers have identified positive outcomes by using CL in PE, they failed to recognize and address the importance of CL Structures. Studies on CL Structures in Chinese educational contexts are still limited. However, based on western research, there are at least 100 different CL Structures developed (Kagan, 1992), and many of them can be utilized by Chinese PE teachers in their classes. A comprehensive introduction of these CL Structures in the Chinese language is needed. Previous research (Casey & Goodyear, 2015; Dyson et al., 2010) suggests that once the CL Structures are well studied and promoted, teachers will be able to teach PE content in a cooperative manner, and the students will be able to move closer to attaining numerous positive outcomes in physical, cognitive, social, and emotional learning domains.

In our systematic literature review, we found that the studies of CL in China were predominantly quantitative, with very few qualitative studies. Scholars in PE (Casey & Goodyear, 2015; Dyson, 2001; Dyson et al., 2019, 2020) have advocated for using qualitative research designs to study CL in PE. Unlike quantitative research, which tries to break down phenomena into measurable or common statistical categories, qualitative research focuses on the "meanings and experiences of the whole person or localized culture" (Winter, 2000, p. 7). Qualitative research design includes methods of gathering nonnumerical data, which aim to understand "the content-related behaviors" of teachers or students and provide "richer insights into the efficacy of interventions" (Hastie & Wallhead, 2016). Qualitative data, including interviews, field notes, document analysis, and teacher's reflection journals, are rich in contextual meanings. Data from qualitative research will be helpful for PE teachers to understand the operational process of the CL and provide an in-depth and descriptive understanding of underlying reasons, opinions, and motivations of using CL in PE. Patton (2002) asserted that qualitative research studies the subject in a "real-world setting [where] the researcher does not attempt to manipulate the phenomenon of interest" (p. 39). To comment on or improve the effectiveness of CL in Chinese PE, more qualitative research should be encouraged and used to seek a deeper understanding of teachers' work, students' learning, and the influence of school culture (Dyson, 2014).

The Chinese PE teachers' limited competency in delivering CL-based PE classes was also intensively discussed by Chinese scholars (Huang et al., 2016; Li, 2008; Sun, 2017). Li (2008) noticed that most school teachers were encouraged by school or district policies to employ CL in their classes. However, school teachers lacked preparation and professional development, which led to a poor fidelity of implementation. PE teachers in that study suggested that it was imperative to learn content knowledge and pedagogical content knowledge needed for implementing CL in preservice physical education teacher education (PETE) programs. However, Li (2008) observed that student teachers had minimal opportunity to learn needed content knowledge and pedagogical

content knowledge of CL in their PETE programs. This finding is consistent with Huang et al. (2016) and Sun (2017), who suggested that there was a massive gap between the learning in PETE programs and the reality of implementation in schools. We argue that it is imperative to integrate content knowledge and pedagogical content knowledge of CL in the Chinese PETE programs so that preservice PE teachers can be better prepared at an early stage.

Chinese PE teachers' interest and motivation for using CL might also be influenced by the National Youth Teachers' Teaching Competitions (NYTTC) (Yan, 2013). The NYTTC is organized by the National Committee of Education, Science, Culture, Health, and Sports and is held every 2 years since 2012. Every Chinese province is eligible to send their best teachers for the national-level teaching skill competitions. However, the assessment criterion in the NYTTC has a strong influence on teachers' performance. To get a higher score in the competition, teachers will tactically adjust their teaching strategies and transitorily use CL in a specific lesson (Yan, 2012). As soon as the competition is over, PE teachers again returned to the teacher-driven teaching style (Dang, 2017). We recommend a consistent and long-term implementation of CL-based practices in Chinese PE classes, even after the NYTTC is completed.

Similar to the United States, high-stakes assessment embedded in the Chinese school system may also be a potential obstacle that hampers the implementation of CL in Chinese PE. It is understandable that the pursuit of excellence, the emphasis on academic success, and the desire of achieving family expectations may much overload and stress the students, which may lead to a reduced willingness to cooperate with other peers and, in turn, reduce the likelihood of being genuinely engaged in CL practices (Wang, 2017). Besides, the one-child policy in China, which was abandoned 5 years ago, might still have continued influence on the implementation of CL in China (Song, 2015; Wang & Feng, 2011). A child born as a single child in the family is more likely to be self-centered and not willing to share or communicate with other peers and adults (Ye, 2018).

In the review, we found that most of the studies were conducted in universities rather than elementary, middle school, and high school levels. Based on the meta-analysis of CL in Chinese PE, Dang (2017) found that 44 of the 65 master's theses and doctoral dissertations from 2002 to 2015 were conducted in universities, another 20 in middle schools and high schools, and only 1 doctoral dissertation was conducted in elementary school. Bao (2008) explained that since the implementation of CL required higher levels of students' cognitive and social skills, it is complicated and challenging to implement CL in elementary schools. Another alternative explanation could be that university teachers are more competent to conduct research than elementary, middle, and high school teachers while taking responsibility for their daily teaching. However, we argue that children should develop those social and emotional skills as early as in preschool and elementary school. And CL in PE can provide an opportunity for elementary and preschool

children to develop those skills and build a foundation for future success in school and life (Dyson, 2001; Johnson et al., 2000; Lafont et al., 2007).

Conclusion

The historical development and educational policies have demonstrated the popularity of CL as an innovative pedagogical practice in general education and PE in China. Despite its espoused presence in Chinese education reform, we found that the conceptualization of CL in Chinese PE was ambiguous. In our review of the current literature, Chinese scholars have not reached a unified agreement on the CL definition. The existing definitions failed to include the five key elements and CL Structures that are germane to inform CL practices (Casey & Goodyear, 2015; Dyson et al., 2012), which result in confusion or misunderstanding of CL for Chinese PE teachers.

In this literature review, we found that the conceptualization of CL in Chinese PE was ambiguous, the implementation of CL was predominantly documented by quantitative data, no qualitative research was found in the review of the literature, and very few studies were conducted at the elementary school level. These findings could be confusing and misleading for the Chinese PE teachers. They might feel challenging to reproduce and follow these works in their classrooms without being guided by in-depth and rich descriptions of the implementation process. They also might perceive CL as a pedagogical practice only for higher education and might resist using it in the context of their elementary schools. Students' willingness to cooperate with others and teachers' pedagogical competencies are essential for the successful implementation of CL in Chinese PE. So long as high-stakes assessment in schools and competition persists, we suggest that there should continue to be policy innovation with changes in schools, whether it is CL or any other innovative pedagogies in PE (Sparkes, 1991).

Despite our findings, there is enthusiasm and support from the Chinese government for scholars and teachers to adopt CL practices. We would like to highlight the work of scholars and PE teachers who continue to promote, adapt, and implement CL in China. We would like to recognize and acknowledge their continuing efforts in their universities and school settings.

Future recommendations

In the end, we are left with more questions than answers regarding the implementation and interpretation of CL in Chinese PE. This literature review provides an essential first step in our understanding of what has happened in China with regard to CL in PE. Notably, in English-speaking countries, we should be aware of research that is not carried out or written in English, notably, studies conducted in China. Based on this current review of the literature, the following implications are presented to stimulate further discussion and guide future research in the field.

(a) There is an apparent lack of professional development and support for Chinese PE teachers (Hao, 2009; Huang et al., 2005; Xie, 2001), making it challenging to facilitate in-service in learning new pedagogical practices such as CL. We recommend widespread and sustained opportunities for in-service teacher education on both a state and national level.

(b) This review indicates that PETE programs in China lack the delivery of content knowledge and pedagogical knowledge to preservice teachers. Many PETE programs in China do not include CL as a pedagogy in their undergraduate programs. We recommend that further efforts to incorporate CL into PETE programs should occur within universities.

(c) In our systematic literature review, we found no qualitative research methods were used to study CL in Chinese PE. We recommend future studies adopt qualitative approaches to provide an in-depth understanding of CL in PE to better understand the contexts in which it is implemented.

(d) While there might be multiple reasons and limitations for why there is a significant contrast between PE teachers' performance at the NYTTC and their daily teaching performance at schools, we recommend and argue for improved sustainability and consistency in Chinese PE classes, even after the NYTTC is completed. Establishing regular meetings to develop a professional learning community led by university researchers and/or PE teachers who have the knowledge and experiences in teaching CL might be a feasible way to better promote CL in Chinese PE.

Contributorship

This study was designed, directed, and coordinated by Ben Dyson. Yanhua Shen and Wen Xiong carried out the search and screening of the relevant literature and initiated the data analysis and interpretation of selected literature. Shen was in charge of drafting the manuscript. Linxiu Dang provided additional references and interpretations of the implementation of cooperative learning in Chinese physical education. Dyson, Xiong, and Dang have made critical revisions of the draft. The manuscript was finally approved by Dyson for publication submission.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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