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Singing and Dancing in the Lighthouse: Investigating Collaborative Learning Through a Movement-based Constructivist Framework

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Abstract

This participatory action research examines the effectiveness of the movement-based constructivist "Lighthouse Framework" (Weatherly & Weatherly, 2023) within the higher education context of Macau. The study adopts a mixed-methods design within the participatory action research, employing both pre- and post-intervention surveys ($N = 71$) and two focus groups discussion ($n = 12$) to assess students' acquisition of musical content knowledge, learning preferences, and the development of the 4Cs (Critical Thinking, Communication, Collaboration, and Creativity) through the Lighthouse Framework. Results indicate that the Lighthouse Framework significantly bolsters students' learning outcomes and fosters an environment conducive to the significant improvement of speaking skills, collaboration skills, confidence, and critical thinking skills. Challenges encountered during the framework's implementation include difficulties in group coordination and leadership navigation. Despite these minor obstacles, the study underscores the Lighthouse Framework's potential as a transformative educational tool, capable of revitalizing collaborative learning and suggesting its adoption as a pedagogic innovation in Macau's higher education landscape.

Introduction

Collaborative learning (CL), an instructional methodology initially proposed in North America during the 1970s, is rooted in constructivist ideology and typically fosters problem-based learning, transitioning from a teacher-centered to a more student-focused pedagogical approach. CL encourages the evolution from solitary learning to engaging individuals as active contributors within learning communities (Harlow & Cobb, 2014; Love et al., 2014; Summers et al., 2005). Numerous studies (Johnson, 1989; Laal & Ghodsi, 2012; Love et al., 2014; Pantiz, 1999a; Pantiz, 1999b) have demonstrated the positive outcomes of CL, such as fostering a positive learning community, enhancing self-esteem, and promoting critical skills. These benefits include increased motivation, higher achievement, and greater productivity. CL differs from cooperation in that cooperation involves individuals or groups working toward a common goal by dividing tasks and working independently. In contrast, collaboration requires a higher level of interaction, with individuals or groups actively working together, sharing ideas, integrating efforts, and solving problems collectively (Kirschner et al., 1996). O'Donnell et. al (2013) advocate for CL as an essential instrument for developing the 21st-century skills necessary to navigate increasing diversity and pluralism.

Although the definition and categorization of 21st-century skills may vary across different frameworks (Child & Shaw, 2016; Silva, 2009; Suto, 2013), there is agreement on emphasizing key skills such as communication, collaboration, creativity, innovation, critical thinking, problem-solving, and leadership. For example, a constructivist approach to learning closely aligns with creativity, as both involve generating novel, useful ideas through imagination across individual and collaborative activities (Craft, 2008). Social interaction also facilitates the creation and refinement of new knowledge. Therefore, a promising approach to structuring learning is to focus on fostering interaction during collaborative tasks (Hämäläinen & Vähäsantanen, 2011).

In higher education, the influence of peer interactions on academic engagement and learning is increasingly acknowledged. Yet, despite the growing recognition, organizing effective peer learning can be complex (Palincsar & Herrenkohl, 2002). Teaching and assessing collaboration is often a new experience for many teachers, requiring significant shifts from traditional classroom management and course design methods (Rowe et al., 2021). This complexity is particularly evident in Asia, where students generally exhibit lower levels of in-class participation (Tani, 2005; Chow et al., 2007; Crosthwaite et al., 2015), and teacher-centered pedagogies are prevalent (Braine, 2003; Hairon & Tan, 2016; Loima & Tuomi, 2016; Saito et al., 2008). Saito and colleagues (2021) explored the challenges of implementing CL in Southeast Asian contexts, highlighting teachers' perceptions of learning processes and the difficulties in crafting engaging and challenging tasks. They identified student reticence to question and the struggle to create compelling tasks as significant barriers (Saito et al., 2021).

Traditional Eastern educational approaches, characterized as didactic and instructional (Rao & Chan, 2009), contrast with the active out-of-classroom engagement of Asian students (Kember, 2000; Tani, 2015). Contrary to the notion that Asian students prefer passive learning or resist educational innovation, Kember (2000) demonstrated their receptiveness to active learning through evidence from over 90 action research projects.

As noted by Atweh and Clarkson (2001), numerous East Asian nations are currently restructuring their educational systems to enhance student participation, group discussions, and collective work within the classroom—approaches typically associated with Western educational strengths. In China, paralleling collaborative learning (CL), the Ministry of Education has advocated for student-centered pedagogies in the Music Curriculum Standards for Full-time Compulsory Schooling (Ministry of Education, 2011). However, the advancement of innovative pedagogies faces obstacles such as oversized classes and inadequate classroom spaces (Brinkmann, 2015; Wang, 2011), as well as entrenched learning cultures (Saito et al., 2008), which impede implementation.

In harmony with CL principles, scholars (Yang et al., 2021; Zhao et al., 2015) emphasize the critical nature of educators' dispositions and their pivotal role in the efficacy of curriculum reforms in China. They also call for more nuanced research into lesson execution. Dello-Iacovo (2009) highlighted the "Cross Century Quality Education Project" curriculum reform initiative, which aims to spur students' curiosity and eagerness for knowledge, drive their active engagement in the educational process, develop their investigational skills, and strengthen the relevance of curriculum to societal needs (p. 243).

An ancient Chinese adage attributed to Confucius, "三人行必有我師焉", implies that in every trio of walkers, one can find a teacher, signifying that collaborative and peer learning are valued, as we can learn from our companions. Additionally, in Chinese saying, "和而不同" also emphasizes the necessity of achieving unity through diversity, which involves embracing and accepting differences. Although CL has been extensively explored within music classrooms in Western settings (Forbes, 2016; Gaunt & Westerlund, 2016; Luce, 2001), its study in Asian contexts has often been limited to international students or English language learners (Crosthwaite et al., 2015; Linh, 2016; Rao, 2019), suggesting a need for broader examination in diverse academic disciplines.

Research Purpose and Research Questions

In Macau's educational context, where participatory action research is undertaken, the term "collaborative learning" often remains more of a concept than a practice, as observed over my years of teaching. My role as an action researcher is to explore how a movement-based constructivist approach within the Lighthouse framework (see the below section) can enhance

collaborative learning. This study evaluates the impact of such educational strategies on students' abilities in music and movement, their learning preferences, and the development of 21st-century skills like communication, collaboration, creativity, and critical thinking. The research further seeks to identify the benefits and challenges perceived by students, assessing the overall pedagogical influence on their educational experiences. Addressing the scarcity of internationally published research from Macau, this study aims to contribute to the local and global understanding of innovative educational approaches. Therefore, I focused on two main research questions:

RQ1:   How does the integration of movement-based activities within the Lighthouse framework affect students' collaborative learning preferences and experiences? What are the perceived benefits and challenges for students?

RQ2:   In what ways does the Lighthouse framework contribute to the overall educational experience of students within a collaborative learning setting?

Conceptual Framework: The Lighthouse Framework

The Lighthouse Framework (Weatherly & Weatherly, 2023) is a pedagogical model that evolves from the foundational concept of scaffolding as introduced by Wood et al. (1976), integrated with Bruner's Spiral Curriculum principles (1960). This innovative framework refines the scaffolding process, not just within individual lessons, but across entire units, providing a systematic method that emphasizes critical reflection at each step. In essence, the Lighthouse Framework guides learners methodically from their existing knowledge base—acquired through previous instruction or inherent understanding—towards the assimilation of new and more complex material. This transition is anchored in a student-centered Constructivist pedagogy, which posits that students learn most effectively when they can link new information to their prior experiences and existing knowledge base, as suggested by Mascolo & Fischer (2004). Moreover, the framework capitalizes on the metaphor of ascending a lighthouse: each step represents the progressive acquisition of knowledge, from the groundwork to more intricate concepts. This journey from the known to the unknown is punctuated by moments of reflection, akin to the landings in a lighthouse where students can contemplate the relevance and application of their newly acquired knowledge to their academic pursuits and beyond (Weatherly & Weatherly, 2023). The Constructivist foundation of the Lighthouse Framework is pivotal because it allows students to actively engage with their education, constructing meaning and integrating learning into the context of their lives as emphasized by Dewey (1938). As students progress through the structured yet collaborative scaffold, they are encouraged to apply what they know to discover and understand new topics and units of study. Therefore, this framework can be particularly adapted to meet the needs of students who have limited or no background in music and movement.

Within the metaphor of the lighthouse, the internal staircase symbolizes the steps taken to elevate students from their prior knowledge to the exploration of new content. At each landing, which signifies the threshold between familiar and novel information, learners are afforded the opportunity to reflect—akin to gazing through a window—on how this new knowledge aligns with their academic and life goals. It is only upon reaching the apex of the lighthouse that they can gain a panoramic understanding, providing them with the capacity to fully apply their learning to their personal and professional lives. The specific steps outlined in the Lighthouse Framework are adaptable, making it a versatile tool designed to be customized for different educational contexts, ensuring that learners can effectively navigate the ascending complexity of the curriculum.
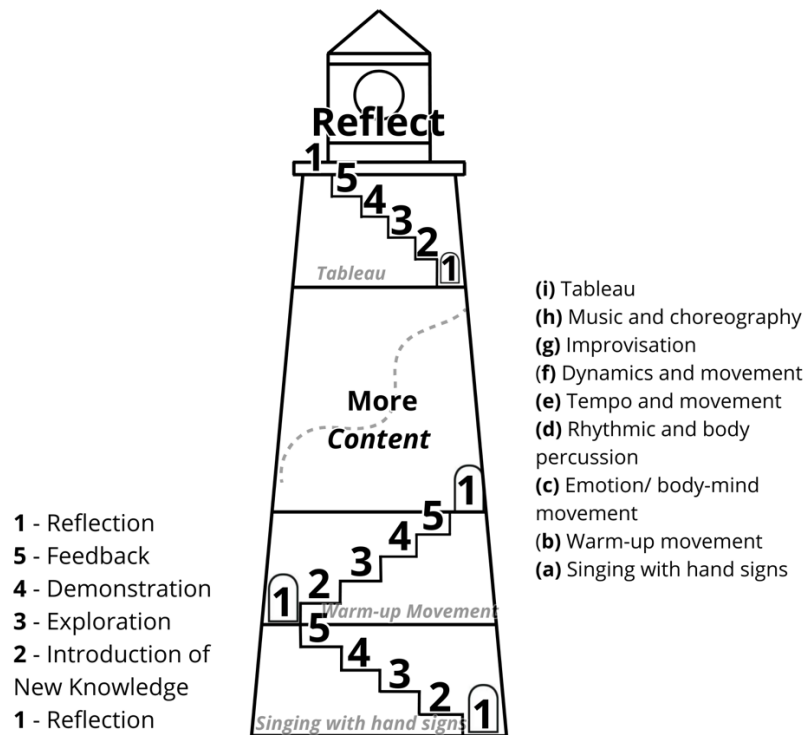

Reflect

Tableau

More
Content

1 - Reflection
5 - Feedback
4 - Demonstration
3 - Exploration
2 - Introduction of
New Knowledge
1 - Reflection

Warm-up Movement

Singing with hand signs

(i) Tableau
(h) Music and choreography
(g) Improvisation
(f) Dynamics and movement
(e) Tempo and movement
(d) Rhythmic and body
percussion
(c) Emotion/ body-mind
movement
(b) Warm-up movement
(a) Singing with hand signs

Figure 1. The Lighthouse Framework (Reprinted with permission from the authors).

In addition, I propose that The Lighthouse Framework (Weatherly & Weatherly, 2023) can serve as an educational scaffold, enhancing not only the acquisition of musical content knowledge but also to refine students' learning preferences and cultivate the 4Cs (Rusdin &

Ali, 2019). By engaging students in a stepwise, reflective learning process, it aligns with Constructivist principles, ensuring that new musical concepts are not only understood but also connected to students' existing knowledge and personal experiences. For musical content knowledge, the framework provides a structure for encountering, practicing, and mastering new skills and information. As students progress, they build upon their existing knowledge in a meaningful and contextually relevant way. Each "landing" or stage in the learning process allows for the integration of new musical theories, techniques, and repertoires, encouraging learners to connect these concepts to previous lessons and their own musical experiences. In terms of learning preferences, the Lighthouse Framework fosters a diverse range of learning modalities, recognizing that students have different ways of learning and engaging with content. It allows for adaptive teaching strategies to meet varied learning needs, encouraging students to discover their preferred methods of engaging with musical content, whether through auditory, visual, kinesthetic, or reflective practices. The promotion of the 4Cs is intrinsic to the design of the Lighthouse Framework:

- **Critical Thinking**: By offering complex problems and encouraging the exploration of music theory and practice, the framework challenges students to think critically about musical composition, performance, and critique (Lai, 2011; Li et al., 2022).
- **Communication**: Music inherently requires the expression of ideas and emotions. The framework emphasizes this by providing opportunities for students to communicate their musical insights, both verbally and through performance (Li et al., 2022).
- **Collaboration**: As students engage with the framework, they work together in activities and projects, fostering a collaborative environment where ensemble work and peer feedback are integral to the learning experience. (Li et al., 2022; Somphol & Payoungkiattikun, 2022).
- **Creativity:** The stepwise nature of the framework, coupled with reflection at each stage, provides a nurturing environment for creative endeavors. It allows students to experiment with and integrate new musical ideas, encouraging innovative thinking and original composition (Kaufman & Beghetto, 2009).

Transforming a traditional curriculum into a dynamic participatory action research project, I have developed a collaborative music and movement course that aligns with the pedagogical philosophy of scaffolding and emphasizes active learning through the lens of the Lighthouse Framework (Weatherly & Weatherly, 2023).

The course, pioneered at a tertiary institution in Macau, welcomes students from all academic disciplines, not just those specializing in music. As a result, this framework is particularly helpful for students with different background. Adhering the suggestion of the Lighthouse Framework, I structured the course around nine scaffolded topics, each corresponding to a

distinct aspect of musical movement, the course progresses from singing with hand signs to more complex activities like improvisation and choreography. The "content" on the lighthouse (topics of study) are arranged into the following scaffolded order:

(a) Singing with hand signs
(b) Warm-up movement
(c) Emotion/ body-mind movement
(d) Rhythmic and body percussion
(e) Tempo and movement
(f) Dynamics and movement
(g) Improvisation
(h) Music and choreography
(i) Tableau

This progression is reflective of the Lighthouse Framework, with each topic building upon the last, analogous to the ascending stripes on a lighthouse. The course diverges from traditional rote learning, instead adopting collaborative learning (CL) principles to foster deeper engagement with the material. A sample unit on rhythmic and body percussion of the Lighthouse Framework would look like this:

- *Reflection*: Rhythm involves the movement of sound.
- *Introduction of New Knowledge*: Reading, composing, and teaching rhythms in creative ways.
- *Exploration*: Students explore and catalog different sounds they can make using their bodies and found object.
- *Demonstration*: Using their bodies and found objects, students collaboratively arrange a percussion cover song with the rest of the class.
- *Feedback*: Students discuss how body movement enhances their rhythmic learning.

In addition, drawing on the support of constructivism theory (Piaget, 1970; Vygotsky, 1978), several strategies have been implemented in this course: (a) heavily reducing lecture time: shifting the classroom to more student-centered learning, (b) promotive interaction: regularly incorporating student-led activities after guided instructions, (c) emphasize on teamwork as well as individual accountability, (d) adding in-class small group preparation time, (e) providing clear rubrics for students to implement CL in their small group time. Grouping is self-directed, allowing students to form teams based on preference, fostering autonomy and cooperation.

The course's activities encourage participants to apply musical concepts through movement, resonating with methods such as Orff Schulwerk and Dalcroze, adapted to a diverse student body. The course culminates in student-created musical projects, where small groups take the lead in instruction, thereby applying their understanding of CL. This participatory action research project not only enriches the students' learning experience but also serves as an investigative tool to assess and refine collaborative pedagogical strategies within the unique educational context of Macau.

Methodology

Research Design

I adopted Participatory Action Research (PAR) as the core methodological approach, revitalizing the potential of practitioner-led research to drive substantive change. PAR broadens the traditional role of a researcher to encompass various stakeholders, actively involving them in every step of the iterative cycle of action and reflection. By emphasizing a joint research approach, proactive societal change, and educational engagement of participants, PAR shifts the research paradigm from an isolated to a shared pursuit, deliberately directed towards fostering profound change at personal, organizational, and systemic levels (Brydon-Miller & Maguire, 2009). Moreover, PAR equips teachers and school practitioners with the principles and structures needed to cultivate a more inclusive, collaborative, and democratic process. This approach deeply integrates all participants, including students, families, and fellow educators, throughout the entire spectrum of the research process, from identifying issues to disseminating findings and implications widely (Fitzpatrick & Handscomb, 2017).

During the first phase of the PAR (participatory action research), I designed the two music and movement courses at a higher education setting in Macau to fit within the scope of PAR. In addition, I invited two other external colleagues acted as critical partners, offering external perspectives to enrich the reflection and analysis process. Throughout the course, I engaged with two groups of students, a total of 90 participants, divided equally between the two courses. As an action study, I aim to address practical problems within a specific context (i.e. CL). Therefore, with participants being part of the existing environment, their involvement is essential for generating authentic insights and applicable solutions. One limitation of this study was the inability to selectively choose participants, given the inherent nature of action research. The cohort was relatively homogenous, primarily consisting of ethnic Chinese, with the main variance being their prior musical knowledge. Over the semester, I conducted 30 sessions total with the two groups, meeting bi-weekly.

During the second phase, I designed a mixed methods study under the PAR to investigate my research questions as well as to increase validity (Schoonenboom & Johnson, 2017) of the research method. It also allows the strengths of qualitative and quantitative research to merge (Creswell, 2003; Creswell & Plano Clark, 2007). I decided to adopt a pre- and post-study design to evaluate changes in the abilities of individual students before and after taking the newly designed course under the Lighthouse Framework. This pre- and post-study design was developed among the principal investigator and the two external colleagues based on three main contents, inspired by both the Lighthouse Framework as well as the principles of Collaborative Learning (CL) that includes music related assessment, learning preferences, and the 4Cs. The surveys were administered using online survey form and were promoted to students during introductory and concluding lectures, as well as through email reminders and postings on the course content system. The surveys included a total of 25 questions, consisting of 11 questions on personal learning styles, 4 questions on music-related self-assessment, and 10 questions on 21st century skills. The students rated themselves using a 5-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement for learning styles and music-related self-assessment questions, and 1 indicating low scores and 5 indicating high scores for 21st century skills questions such as leadership, confidence, and motivation. In order to test the validity of this survey, I calculated the Cronbach's alpha to assess internal consistency, and the result was alpha = 0.8. This indicates strong reliability and contributes to the measure's validity.

During the third phase, a total of 90 undergraduate students were invited to participate in the study and complete the pre-study survey at the beginning of the course. Then the Collaborative Music & Movement Course in the "Lighthouse" is implemented for 15 sessions. All data was anonymized, and participant consent was duly obtained, ensuring the ethical integrity of data use and rights of the participants. The methodological procedures adhered to guidelines set by the appropriate supervisory bodies, assuring legal compliance in data handling. During this process, I recorded the course via video recordings and photos of the course.

During the last phase, I collected the post-study survey at the end of the course. In order to have a true mixed methods study within the Participatory Action Research (PAR), this study also employed a point of integration, which included the strategy of connecting from the analysis of one set of data to the collection of a second set of data (Schoonenboom & Johnson, 2017). Therefore, two focus groups of students (*n = 12)* are invited in a volunteer basis to participate with me. Thus, semi-structured interview questions of the focus group were structured based on the results of the pre- and post-surveys. Semi-structure interviews are used to gain insights into a person's subjective experiences, opinions and motivations (Hak, 2007). The twelve students who participated in the focus groups were based on volunteering.

The meeting lasted around 45 to 56 minutes each and were audio-recorded for transcription and translation.

Data Analysis

At the end of the course, students (*N = 71*) completed both surveys, and their data were used for analysis. All the participants were undergraduate students, comprising of 83% female and 17% male students with a mix of majors including education, accounting, Chinese language, Portuguese language, psychology, communication, and engineering in various years of their undergraduate studies. The data obtained from the surveys were analyzed using paired t-tests to compare students' self-ratings at the beginning and end of the course. A statistical significance level of $\alpha = .05$ was set for the analysis. The continuous data were reported as mean ± standard deviation (SD).

The analysis of the focus group interviews followed an inductive method based on thematic analysis (Braun & Clarke, 2012) which involved extracting codes and categories from the data using content analysis using MAXQDA software for qualitative analysis. Before coding, I reflected on coding categories. The coding process comprised three cycles of coding, namely open coding, pattern coding, and theme coding. In the categorization stage, a total of eight codes were generated. In the subsequent reduction stage, these codes were further organized into five main themes. To enhance the validity of my research, I employed triangulation with a research assistant by utilizing student interviews, as well as pre-test and post-test survey results as data points. Additionally, I took actions to identify and eliminate any personal biases that could potentially affect the data's objectivity, and to accurately describe the events of the investigation.

Results

Survey Results

The results of the music-related skills of students suggested a significant increase after taking the Music and Movement course. Specifically, the pre-test (M = 2.54, SD = 1.13) and post-test (M = 3.04, SD = 2.7) ratings for the question "I am comfortable at dancing and singing in front of people" indicate a significant improvement in students' comfortability in dancing and singing after a semester of the course, with $t(70) = -2.82$, $p = .0006$. Additionally, for the question "I consider myself a musical person," the pre-test (M = 2.54, SD = 1.13) and post-test (M = 2.96, SD = 1.02) ratings show a significant difference with $t(70) = -2.57$, $p = .001$, allowing us to reject the null hypothesis of no difference. Regarding learning style preferences, there were no significant differences for most questions, except for the question "I have many experiences learning through group projects before," with pre-test (M = 3.58,

SD = 0.87) and post-test (M = 3.96, SD = 0.75), $t(-2.95)$, $p = 0.004$, indicating that the course increased their experiences learning through collaborative design.

For 21st-century skills, students ranked themselves significantly higher in public speaking skills ($p < 0.005$), self-management skills ($p < 0.05$), relationship with others ($p < 0.05$), leadership skills ($p < 0.05$), collaboration skills ($p < 0.005$), confidence ($p < 0.005$), and critical thinking skills ($p < 0.05$). However, for creative thinking skills, there was only a slight improvement in the mean rating, which was not statistically significant.

Table 1

Comparison of pre-test and post-test. Means, standard deviation, and p value for students self-assessing skills and preferences

Categories	Survey Questions	Pre-test	Post-test	*p* value
		Mean ± SD	Mean ± SD	
Music-related Self-assessment	I am comfortable at dancing and singing in front of people	2.54 ± 1.13	3.04 ± 0.98	0.006*
	I consider myself a musical person	2.54 ± 1.13	2.96 ± 1.02	0.01*
Learning Styles Preferences	I prefer to take a test rather than an alternative final (presentation, performance, etc.)	2.57 ± 1.18	2.46 ± 1.31	0.56
	I have experiences learning through group projects.	3.58 ± 0.87	3.96 ± 0.75	0.004***
	I prefer to learn through doing, rather than memorizing.	3.89 ± 0.96	4.0 4 ± 0.87	0.28
	Getting a good grade is the most important thing as a student	3.69 ± 0.90	3.60 ± 0.92	0.57
	I prefer to sit and listen in the class.	3.25 ± 1.09	3.11 ± 1.02	0.43
21st Century Skills Self-Assessment	Public Speaking Skills	2.83 ± 0.81	3.30 ± 0.80	0.0008***
	Self-Management Skills	3.32 ± 0.75	3.60 ± 0.73	0.03*
	Relationship with Others	3.58 ± 0.73	3.87 ± 0.67	0.019*

Leadership Skills	3.14 ± 0.88	3.45 ± 0.81	0.019*
Collaboration Skills	3.46 ± 0.75	3.82 ± 0.72	0.005***
Confidence	3.05 ± 0.77	3.42 ± 0.71	0.002***
Critical Thinking Skills	3.11 ± 0.82	3.38 ± 0.66	0.019*
Creative Thinking Skills	3.28 ± 0.84	3.45 ± 0.81	0.14

* Data represents statistical significance at p value > 0.05
*** Data represents statistical significance at p value > 0.005

Focus Groups Results

Prior to the meeting, all participants provided informed consent for their involvement in the study. The focus group data was transcribed and translated. Through rigorous analysis of the focus group data, themes emerged regarding the benefits are titled as (a) Facilitation of Multimodal Learning (b) Enhancement of Interpersonal Dynamics through Collaborative Learning, and (c) Increased Motivation through Collaborative Engagement.

Facilitation of Multimodal Learning Through the Lighthouse Framework
The two focus groups' participants reflected an enhanced comprehension of musical concepts, evidenced by a marked augmentation in the depth of content knowledge. Upon the revelation of the survey outcomes during interviews, students unanimously concurred that the pedagogical structure of the course was instrumental in deepening their understanding of the musical content, transcending the existing knowledge base afforded by their musical backgrounds. They attested to the acquisition of competencies pivotal for the formulation of musical activities geared toward young learners, with a newfound sense of proficiency in the domain outstripping that garnered from prior musical courses. Notably, the educational experience encompassed an amalgamation of learning representations — auditory, visual, and kinesthetic — which, albeit discomfiting for some due to unfamiliarity with kinesthetic methods, was ultimately recognized as a reinforcing agent for musical comprehension. A participant encapsulated this sentiment, reflecting on the enduring retention of musical pieces facilitated by the integrative approach: "At the end of this course, I found it very interesting because I remember a lot of songs that we sang and dance in this course, and what I have learned through the song." (MR/G1/S5)

Enhancement of Interpersonal Dynamics through Collaborative Learning
The collaborative learning approach in the course played a pivotal role in cultivating friendships and enhancing communicative competencies among participants. The focus group yielded insights into the positive social dynamics engendered by this approach, as illustrated by Student 3's experience: "Even when we hold differing opinions, it is still enjoyable. We often have varying perspectives, but they have not caused any significant issues." (ID/G2/S3) Additionally, the choice to collaborate with friends did not impede the emergence of a collegial atmosphere; instead, it provided a familiar context within which constructive discord could be navigated. Student 4 observed, "Disagreements can serve as a means of communication, although perhaps not the most ideal. Nevertheless, they can provide an opportunity to learn more about your friends." (ID/G2/S4) The process of engaging with and resolving these differences was credited with fostering advanced communication skills.

Increased Motivation through Collaborative Engagement
Collaborative learning increased engagement amongst participants, who found it to be a more stimulating and efficacious approach than individual learning. From the interviews conducted, it was apparent that students enjoyed the collaborative aspects of the course. Group projects often simulate real-world scenarios, making learning more relevant and applicable to students' lives, which can increase motivation and the perceived value of educational tasks. Many students said they felt more eager to come to this class than any other. Student 11 said, "I really like this class; it has taught me so much. I always looked forward to coming to class and learning with my classmates. Everything we learned built on what came before, so I could keep up and really get into music and dance, even though I started with no idea about it. It pushed me to try new things with my friends too." (IM/G2/S11)

On the other hand, students identified two primary challenges: (a) Difficulties in Group Coordination and (b) Leadership Navigation in Collaborative Learning.

Difficulties in Group Coordination
Within the structured environment of the Lighthouse framework, students faced the task of coordinating schedules to accommodate collaborative work outside of classroom hours, especially in preparation for class demonstrations which form a critical part of the learning process. Despite the built-in class time for collaboration, the diversity of individual schedules necessitated finding alternative times for group work. To navigate this, students utilized the framework's emphasis on flexibility and problem-solving, resorting to digital communication tools like text messaging and online meetings to ensure continuity in their collaborative efforts.

Leadership Navigation in Collaborative Learning

The Lighthouse framework's principles suggest a balanced distribution of leadership roles to guide the collaborative process. However, variations in group dynamics occasionally led to challenges in leadership distribution. In some instances, leadership was not formally assigned, resulting in a shared approach to task management. Conversely, certain groups found it beneficial to appoint a leader to steer their collective efforts, particularly when the group size warranted more coordinated direction. While the framework implicitly supports the development of leadership skills among students, it also underscores the importance of having a clear leader to prevent collaborative efforts from becoming disorganized. Without a defined leader, students perceived the collaborative process to be less focused and effective, highlighting a critical learning point within the Lighthouse framework's application.

Discussion

In this study, I assess Collaborative Learning (CL) as a process rather than focusing solely on the outcome, adopting a more holistic perspective on students' 4Cs skills (Child & Shaw, 2016).The integration of movement-based activities within the Lighthouse framework fundamentally shapes students' collaborative learning preferences and experiences by engaging them in a multi-sensory approach to education (Harlow & Cobb, 2014; Love et al., 2014; Summers et al., 2005). The Lighthouse Framework provides a structure that emphasizes key elements such as collaboration, creativity, and adaptability. In practice, these elements were integrated into classroom activities by designing learning tasks that promote student engagement, encourage group work, and facilitate creative problem-solving. The iterative nature of PAR allowed for continuous refinement of these activities, ensuring they aligned with the principles of the Lighthouse Framework. This active participation and movement-based teaching fosters a deeper connection with the material, thereby enhancing their understanding and retention of concepts. Moreover, it tends to democratize the learning environment, as students often feel more at ease to express themselves and contribute to group activities when the learning process involves movement. Among the perceived benefits, students report a significant increase in motivation and engagement, often stemming from the novelty and excitement that movement-based activities bring to the classroom. These activities also serve to cement learning outcomes through embodied cognition, where the act of doing reinforces comprehension and memory retention (Mascolo & Fischer, 2004). Additionally, the physical aspect of these activities can encourage students to develop skills in coordination, balance, and spatial awareness, which are beneficial beyond the music classroom. However, some students may initially feel self-conscious or uncomfortable with movement activities, especially if they are accustomed to more traditional learning environments.

The pre- and post-survey findings suggested the CL approach through the Lighthouse Framework has enhanced various skillsets of the participated students ($N= 71$). Notably, the students ranked themselves higher in terms of their ability to sing and dance in front of people, as well as their perception of themselves as musical individuals compared to their abilities before the course. Additionally, students reported higher rankings in various 21st century skillsets, including self-management, relationship building, leadership, confidence, and critical thinking skills after the course (Child & Shaw, 2016; Silva, 2009; Suto, 2013). Among these skills, collaboration and public speaking skills were statistically significant. Previous research has indicated that East Asian students commonly experience anxiety while speaking in class (Cheng, 2000; Mak, 2011; Tani, 2008). However, this study demonstrated that through student-led activities and collaborative learning, students were able to improve their 21st century skills and learning, such as public speaking, which is consistent with prior research (Johnson, 1989; Johnson et al., 2000; Nokes-Malach et al., 2015; Pantiz, 1999). With the implementation of the Lighthouse framework, it encourages active engagement and participation, which leads to improvements in speaking and collaboration skills. By prompting students to voice their thoughts and work together, it boosts confidence and hones critical thinking abilities. The experiential nature of the activities within the framework makes learning more impactful, helping students to apply concepts practically, thereby deepening their understanding and facilitating the development of these crucial skills (Mascolo & Fischer, 2004).

Two hinderances was observed in the results related to the survey results and students' learning preferences. In examining the pre and post survey outcomes, it was observed that enhancements in creativity skills were not statistically significant. As an action researcher, this leads to introspection about potential gaps in the framework that may not adequately nurture student creativity. Although students engaged in various creative tasks within their groups, the negligible improvement in this domain suggests a need for further exploration to understand the underlying reasons and to possibly refine the approach to better support creative development.

In terms of students' learning preferences, the question regarding their preference for taking the final exam, "I prefer taking a test rather than an alternative final (presentation, performance, etc.)," showed a higher standard deviation, indicating that the data was more dispersed. This suggested that some students still strongly preferred written examinations rather than presentations or performances, while others did not. This preference did not change significantly even after the course. Similarly, for the other two questions, "I prefer to learn through doing rather than memorizing" and "Getting a good grade is the most important thing as a student," there were slight shifts in the mean scores towards "doing" and less emphasis on getting good grades, but the overall shifts were not significant. Wong (2004) and

Wu (2015) believe that some researchers have attributed passive learning styles to the culture-based approach to learning, which limits the understanding of the complexities of Asian students' experiences.

> *From an essentialist point of view, students from Confucian heritage cultures may typically display a reluctance to speak up or give their opinion; rely heavily on memorization; lack critical thinking; respect the authority of the teacher; and expect to be spoon-fed.* (Wu, 2015, p. 755)

Despite the potential influence of cultural heritage on students' learning preferences, many expressed a desire for a more diverse and active approach to learning. The findings from the focus group meeting indicated that students benefited greatly from the CL approach within the Framework. Although they may not have been able to specifically identify their growth in terms of 21st century skills, the students confirmed that they gained increased knowledge in music-related content, which aligns with the academic benefits supported by numerous studies (Adams & Slater, 2002; McDuff, 2012; Moore & Hatch, 2002; Wong & Abbruzzese, 2011). Moreover, the social benefits and positive peer collaboration were also evident. As I referred this old Chinese idiom in the beginning of this article, "三人行必有我師焉" (With three men walking, there is always a teacher among them), the students reported acquiring knowledge from their group members that led to higher levels of thinking and better task outcomes, which aligns with existing research (Jarvenoja and Jarvela, 2009; Nokes-Malach et. al, 2015; Prichard et. al, 2006).

As an action researcher, I have noted a substantial transformation in the learning dispositions and motivational levels within my classroom after the implementation of this framework. This transformation is particularly noteworthy considering the prevalent teacher-centered pedagogical approach in Macau, a model to which students have traditionally adapted well and felt at ease with. The introduction of the Lighthouse Framework has prompted a discernible departure from this norm, fostering a more dynamic, student-driven environment. The students have demonstrated not only a readiness but also an enthusiasm for this change, actively engaging with the material and collaborating with peers in ways that suggest a profound enhancement of both their educational experience and intrinsic motivation to learn.

Limitation and Recommendation for Future Research

Although this study yielded some significant results, there are several limitations that must be taken into consideration. First, this study focused on only one single course in one semester. Therefore, it is possible that some of the increase in self-assessment could be due to personal growth of the students, and not solely from the course. To address this limitation, future studies could include more courses, different semesters, and larger sample sizes to better

understand the effectiveness of collaborative learning (CL) in various contexts. Furthermore, it is recommended that further CL research be conducted with students in Asia, especially in the music classroom setting. It is important to note that assumptions about how cultural background affects learning preferences may not be fair for Asian students. Studies have shown that cultural background does not necessarily determine one's learning preferences (Kember, 2000; Rao & Chan, 2009). Thus, it is worth investigating how exposure to CL approaches may shape students' learning preferences.

It is true that many traditional teaching styles in East Asian countries tend to place the teacher at the center of attention, while passive learning is encouraged. This can lead to students being rewarded for being quiet and passive, rather than participating actively in class. The master-apprentice model, as described by Allsup (2016), remains a prominent learning style in music classrooms in Macau. Although research has increasingly focused on student-centered approaches, the use of collaborative learning (CL) may facilitate a transition towards more innovative learning approaches in Asian classrooms. Therefore, conducting more studies on the implementation of CL in music classrooms in China is highly recommended. These studies could provide insights into how CL can be effectively integrated into traditional music education practices, while promoting creativity, critical thinking, and social skills among students. Such research can also help music educators in China to make informed decisions about instructional strategies that align with the needs and expectations of their students.

Conclusions

The study highlights the Lighthouse Framework (Weatherly & Weatherly, 2023) as a potentially transformative pedagogical instrument. Its unique incorporation of movement-based activities into the curriculum could reinvigorate the collaborative learning paradigm, presenting a compelling case for its integration as an innovative educational methodology within the higher education sector of Macau. The Framework's adaptability and emphasis on student-centered learning experiences demonstrate its capacity to align with and enhance current educational practices, offering a robust alternative to conventional teaching models. This aligns with contemporary educational shifts towards more dynamic, interactive, and engaging learning environments, suggesting the Lighthouse Framework's adoption could significantly contribute to the progressive evolution of Macau's academic landscape. While collaborative learning (CL) is typically more prevalent in higher education, it is suggested that it be embraced in primary and secondary schools to support a more fluid educational progression for students. To facilitate this, it would be prudent for local educational authorities to provide extensive teacher training and incentives for CL methods within the Lighthouse Framework.

Music education, being intrinsically collaborative, calls for a shift towards a CL framework to engender the experience of "*musicking*," as conceptualized by Small (1999), who posits that "musicking brings into existence among those present a set of relationships, and it is in those relationships that the meaning of the act of musicking lies" (p. 13). By altering learning attitudes, methodologies, and motivations, such initiatives can enrich the educational experience for Asian students and advocate for a departure from conventional pedagogies in favor of more collaborative, learner-focused approaches. The profound connections forged through collaborative musicking reveal the true nature of music.

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References

Adams, J. P., Brissenden, G., Lindell, R. S., Slater, T. F., & Wallace, J. (2002). Observations of student behavior in collaborative learning groups. *Astronomy Education Review*, *1*(1), 25-32.

Allen, A. C. (2018). *The role of mindsets on southeast Asian youth: A study on academic attitudes and performance*. University of California, Riverside.

Allsup, R. E. (2016). *Remixing the classroom: Toward an open philosophy of music education*. Indiana University Press.

Atweh, B., & Clarkson, P. (2001). Internationalisation and globalisation of mathematics education: Towards an agenda for research/action. *Sociocultural Research on Mathematics Education: An International Perspective*, 77-94.

Braine, G. (2003). From a teacher-centered to a student-centered approach: A study of peer feedback in Hong Kong writing classes. *Journal of Asian Pacific Communication*, *13*(2), 269-288.

Braun, V., & Clarke, V. (2012). *Thematic analysis*. American Psychological Association.

Brinkmann, S. (2015). Learner-centred education reforms in India: The missing piece of teachers' beliefs. *Policy Futures in Education*, *13*(3), 342–359. https://doi.org/10.1177/1478210315569038

Brydon-Miller, M., & Maguire, P. (2009). Participatory action research: Contributions to the development of practitioner inquiry in education. *Educational Action Research*, *17*(1), 79-93.

Chandra, R. (2015). Collaborative learning for educational achievement. *IOSR Journal of Research & Method in Education (IOSR-JRME)*, *5*(2), 4-7.

Charmaz, K. (2003). *Grounded theory: Objectivist and constructivist methods*. In N. K. Denzin, & Y. S. Lincoln (Eds.), Strategies for qualitative inquiry (2nd ed., pp. 249-291). Sage.

Cheng, X. (2000). Asian students' reticence revisited. *System*, *28*(3), 435–446. https://doi.org/10.1016/s0346-251x(00)00015-4

Child, S., & Shaw, S. (2016). Collaboration in the 21st century: Implications for assessment. *Apollo*. https://doi.org/10.17863/CAM.100344

Chow, S. S. Y., & Chu, M. H. T. (2007). The impact of filial piety and parental involvement on academic achievement motivation in Chinese secondary school students. *Asian Journal of Counselling*, *14*(1-2), 91-124.

Creswell, J. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage.

Crosthwaite, P. R., Bailey, D. R., & Meeker, A. (2015). Assessing in-class participation for EFL: considerations of effectiveness and fairness for different learning styles. *Language Testing in Asia*, *5*(1). https://doi.org/10.1186/s40468-015-0017-1

Fitzpatrick, J., & Handscomb, B. (2017). Co-creating spaces on an adventure playground: using participatory action research as an approach to continuing professional development. In Russell, W., Lester, S., & Smith, H. (Eds.), *Practice-based research in children's play* (pp. 147-166). Policy Press.

Forbes, M. (2016). If the shoe doesn't fit: a case and a place for collaborative learning for music practice in higher education. *Australian Journal of Music Education*, *50*(1), 53-62.

Gaunt, H., & Westerlund, H. (Eds.). (2016). *Collaborative learning in higher music education*. Routledge.

Hak, T. (2007). Waarnemingsmethoden in kwalitatief onderzoek. In L. PLBJ & H. TCo (Eds.), *Kwalitatief onderzoek: Praktische methoden voor de medische praktijk.* [Observation methods in qualitative research] (pp. 13–25). Houten: Bohn Stafleu van Loghum.

Hämäläinen, R., & Vähäsantanen, K. (2011). Theoretical and pedagogical perspectives on

orchestrating creativity and collaborative learning. *Educational Research Review*, *6*(3), 169-184.

Harlow, A., & Cobb, D. J. (2014). Planting the seed of teacher identity: Nurturing early growth through a collaborative learning community. *Australian Journal of Teacher Education (Online)*, *39*(7), 70-88.

Järvenoja, H., & Järvelä, S. (2009). Emotion control in collaborative learning situations: Do students regulate emotions evoked by social challenges. *British Journal of Educational Psychology*, *79*(3), 463-481.

Jensen, M., Moore, R., & Hatch, J. (2002). Cooperative learning: Part I: cooperative quizzes. *The American Biology Teacher*, *64*(1), 29-34.

Johnson, D. W., & Johnson, R. T. (2014). Cooperative Learning in 21st Century. [Aprendizaje cooperativo en el siglo XXI]. *Anales de Psicología/Annals of Psychology*, *30*(3), 841-851.

Johnson, D. W., Johnson, R. T., & Stanne, M. B. (2000). *Cooperative learning methods: A meta-analysis*. University of Minnesota.

Johnson, D.W. & Johnson, R.T. (1989). Cooperation and Competition Theory and Research. Edina, Minnesota. USA. Interaction Book Co.

Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The four C model of creativity. *Review of general psychology*, *13*(1), 1-12.

Kember, D. (2000). Misconceptions about the learning approaches, motivation and study practices of Asian students. *Higher Education*, *40*(1), 99–121. https://doi.org/10.1023/a:1004036826490

Kirschner, B. W., Dickinson, R., & Blosser, C. (1996). From cooperation to collaboration: The changing culture of a school/university partnership. *Theory into practice*, *35*(3), 205-213.

Laal, M., & Ghodsi, S. M. (2012). Benefits of Collaborative Learning. Procedia—Social and Behavioral Sciences, 31, 486-490. https://doi.org/10.1016/j.sbspro.2011.12.091

Laal, M., & Laal, M. (2012). Collaborative learning: what is it? *Procedia - Social and Behavioral Sciences*, *31*(1), 491–495. https://doi.org/10.1016/j.sbspro.2011.12.092

Lai, E. R. (2011). Critical thinking: A literature review. *Pearson's Research Reports*, *6*(1), 40-41.

Li, Z., Zhou, M., & Lam, K. K. L. (2022). Dance in Zoom: Using video conferencing tools to develop students' 4C skills and self-efficacy during COVID-19. *Thinking Skills and Creativity*, *46*, 101102.

Linh, N. D., & Suppasetseree, S. (2016). The Development of an Instructional Design Model on Facebook Based Collaborative Learning to Enhance EFL Students' Writing Skills. *IAFOR Journal of Language Learning*, *2*(1), 48-66.

Loima, J., & Vibulphol, J. (2016). Learning and Motivation in Thailand: A Comparative Regional Study on Basic Education Ninth Graders. *International Education Studies*, *9*(1), 31-43.

Love, A. G., Dietrich, A., Fitzgerald, J., & Gordon, D. (2014). Integrating Collaborative Learning Inside and Outside of the Classroom. *Journal on Excellence in College Teaching*, *25*.

Luce, D. W. (2001). Collaborative learning in music education: A review of the literature. *Update: Applications of Research in Music Education*, *19*(2), 20-25.

Mak, B. (2011). An exploration of speaking-in-class anxiety with Chinese ESL learners. *System*, *39*(2), 202–214. https://doi.org/10.1016/j.system.2011.04.002

McDuff, E. (2012). Collaborative learning in an undergraduate theory course: An assessment of goals and outcomes. *Teaching Sociology*, *40*(2), 166-176.

Ministry of Education, People's Republic of China. (2011). *Yiwu jiaoyu yinyue kecheng biaozhun (2011 Nian ban)* [Music curriculum standards of compulsory schooling (2011 edition)]. Beijing Normal University Press.

Nokes-Malach, T. J., Richey, J. E., & Gadgil, S. (2015). When Is It Better to Learn Together? Insights from Research on Collaborative Learning. *Educational Psychology Review*, *27*(4), 645–656. https://doi.org/10.1007/s10648-015-9312-8

O'Donnell, A. M., & Hmelo-Silver, C. E. (2013). Introduction: What is collaborative learning?: An overview. In A. M. O'Donnell & C. E. Hmelo-Silver (Eds.), *The international handbook of collaborative learning* (pp. 1-15). Routledge.

Palincsar, A. S., & Herrenkohl, L. R. (2002). Designing Collaborative Learning Contexts. *Theory into Practice*, *41*(1), 26–32. https://doi.org/10.1207/s15430421tip4101_5

Panitz, T. (1999a). The Motivational Benefits of Cooperative Learning. *New Directions for Teaching and Learning*, *1999*(78), 59–67. https://doi.org/10.1002/tl.7806

Panitz, T. (1999b). Benefits of Cooperative Learning in Relation to Student Motivation. In M. Theall (Ed.), Motivation from within: Approaches for Encouraging Faculty and Students to Excel, New Directions for Teaching and Learning (pp. 59-68). Josey-Bass Publishing.

Panitz, T., & Panitz, P. (1998). Encouraging the use of collaborative learning in higher education. *University Teaching: International Perspectives*, 161-201.

Piaget, J. (1970). Piaget's Theory (G. Gellerier & J. Langer, Trans.). In P.H. Mussen (Ed.), *Carmichael's manual of child psychology* (3rd ed, Vol. 1). Wiley.

Prichard, J. S., Stratford, R. J., & Bizo, L. A. (2006). Team-skills training enhances collaborative learning. *Learning and Instruction*, *16*(3), 256-265.

Rao, N., & Chan, C. K. (2009). Moving beyond paradoxes: Understanding Chinese learners and their teachers. In C.K.K. Chan & N. Rao (Eds.), *Revisiting the Chinese learner: Changing contexts, changing education* (pp. 3-32). Dordrecht.

Rao, P. S. (2019). Collaborative learning in English language classrooms. *ACADEMICIA: An International Multidisciplinary Research Journal*, *9*(2), 5-16.

Rowe, N., Martin, R., Buck, R., & Mabingo, A. (2021). Teaching collaborative dexterity in higher education: Threshold concepts for educators. *Higher Education Research & Development*, *40*(7), 1515-1529.

Rusdin, N. M., & Ali, S. R. (2019). Practice of fostering 4Cs skills in teaching and learning. *International Journal of Academic Research in Business and Social Sciences*, *9*(6), 1021-1035.

Saito, E., Takahashi, R., Wintachai, J., & Anunthavorasakul, A. (2021). Issues in introducing collaborative learning in Southeast Asia: A critical discussion. *Management in Education*, *35*(4), 167-173.

Schoonenboom, J., & Johnson, R. B. (2017). How to Construct a Mixed Methods Research Design. *Kolner Zeitschrift fur Soziologie und Sozialpsychologie*, *69*(Suppl 2), 107–131. https://doi.org/10.1007/s11577-017-0454-1

Silva, E. (2009). Measuring skills for 21st-century learning. *Phi delta kappan*, *90*(9), 630-634.

Small, C. (1998). *Musicking: The meanings of performing and listening*. Wesleyan University Press.

Somphol, R., Pimsak, A., Payoungkiattikun, W., & Hemtasin, C. (2022). Enhancing 4Cs Skills of Secondary School Students Using Project-Based Learning. *Journal of Educational Issues*, *8*(2), 721-731.

Song, Y. (2021). How Chinese students participate in classroom dialogue with the advancement of new curriculum reform. *Asia Pacific Journal of Education*, *42*(1), 1–21. https://doi.org/10.1080/02188791.2021.2013159

Summers, J. J., Gorin, J. S., Beretvas, S. N., & Svinicki, M. D. (2005). Evaluating collaborative learning and community. *The Journal of Experimental Education*, *73*(3), 165-188.

Suto, I. (2013). 21st Century skills: Ancient, ubiquitous, enigmatic. *Research Matters: A*

Cambridge Assessment Publication, *15*, 2-8.

Tan, C., & Hairon, S. (2016). Education reform in China: Toward classroom communities. *Action in Teacher Education*, *38*(4), 315-326.

Tani, M. (2005). Quiet, But Only in Class: Reviewing the In-Class Participation of Asian Students. In Higher Education Research and Development Society of Australia Conference (Vol. 5, p. 2007). http://conference.herdsa.org.au/2005/pdf/non_refereed/030.pdf

Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes*. Harvard university press.

Wang, D. (2011). The dilemma of time: Student-centered teaching in the rural classroom in China. *Teaching and Teacher Education*, *27*(1), 157–164. https://doi.org/10.1016/j.tate.2010.07.012

Weatherly, K. I. C., & Weatherly, C. A. (2023). The Lighthouse Framework: Proposing a Movement-Based Constructivist Framework for Early Childhood Music Education and Pre-Service Education Programs. *Journal of General Music Education*, *37*(3), 17-24. https://doi.org/10.1177/27527646231211906

Whatley, J., & Bell, F. (2003). Discussion across borders: Benefits for collaborative learning. *Educational Media International*, *40*(1-2), 139-152.

Wong, C. K., & Abbruzzese, L. D. (2011). Collaborative learning strategies using online communities. *Journal of Physical Therapy Education*, *25*(3), 81-87.

Wong, J. K. K. (2004). Are the Learning Styles of Asian International Students Culturally or Contextually Based? *International Education Journal*, *4*(4), 154-166.

Wu, Q. (2015). Re-examining the "Chinese learner": A case study of mainland Chinese students' learning experiences at British Universities. *Higher Education*, *70*, 753-766.

Yang, Y., Yin, A., & Guan, T. (2021). Mapping music education research in Mainland China (2007–2019): A metadata-based literature analysis. *International Journal of Music Education*, *39*(2), 234–246. https://doi.org/10.1177/02557614209889

Zhao, W., Mok, I. A. C., & Cao, Y. (2016). Curriculum reform in China: student participation in classrooms using a reformed instructional model. *International Journal of Educational Research*, *75*, 88–101. https://doi.org/10.1016/j.ijer.2015.10.005

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