

SELF-DIRECTED BLENDED LEARNING MODEL ON EMOTIONAL INTELLIGENCE AND ACHIEVEMENT

Fang LIU

ORCID: 0009-0003-1859-779X

School of Industrial Education and Technology
King Mongkut's Institute of Technology Ladkrabang
Bangkok, THAILAND

Dr. Kanyarat SRIWISATHIYAKUN

ORCID: 0000-0002-4533-6400

School of Industrial Education and Technology
King Mongkut's Institute of Technology Ladkrabang
Bangkok, THAILAND

Dr. Siririat PETSANGSRI

ORCID: 0000-0002-4828-1740

School of Industrial Education and Technology
King Mongkut's Institute of Technology Ladkrabang
Bangkok, THAILAND

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ABSTRACT

In the era of advancing globalization, developing emotional intelligence (EI) has become essential for adolescents to manage emotional stress, build social relationships, and adapt to changing environments. This study developed a Self-Directed Blended Learning (SDBL) model incorporating Intangible Cultural Heritage music to enhance students' EI and academic achievement. The research was conducted in two phases: First, the SDBL model was designed and validated, consisting of five components (setting learning targets, planning, gathering information, online and offline learning activities, and post-lesson reflection). Five education experts evaluated the model using a 5-point Likert scale, yielding an average score of 4.84, confirming its pedagogical quality. Second, the teaching experiment was conducted at Taiyuan University of Science and Technology. A total of 112 non-music undergraduate students, who voluntarily enrolled in the Shanxi Intangible Cultural Heritage Music Appreciation course, participated in the study. The students were randomly divided into an experimental group and a control group, with 56 students in each. After the intervention, both groups completed post-tests to measure their emotional intelligence and academic achievement. Emotional intelligence was assessed using a revised 25-item version of the Schutte Self-Report Emotional Intelligence Test (SSEIT). Five experts evaluated the test's content validity using the Item-Objective Congruence (IOC) method, with scores ranging from 0.6 to 1. Academic achievement was measured using test items from a nationally recognized Intangible Cultural Heritage (ICH) database maintained by the Chinese government. Five experts reviewed these items, and their IOC scores ranged from 0.8 to 1.0. The collected data were analyzed using t-tests and MANOVA. The results showed that the experimental group performed significantly better than the control group in both emotional intelligence and academic achievement. Additionally, a positive correlation was found between the two variables. The findings demonstrate that SDBL model incorporating Intangible Cultural Heritage music can enhance EI and academic achievement while simultaneously developing cognitive and emotional competencies, offering an innovative solution for preparing students to meet future challenges.

Keywords: Self-directed blended learning model, emotional intelligence, achievement, intangible cultural heritage music, higher education.

INTRODUCTION

Emotional Intelligence (EI), as a key educational soft skill, is becoming increasingly important. Research has demonstrated that EI development programs can enhance classroom climate, improve teaching practices, and foster students' engagement and achievement (Ganesan et al., 2023). Integrating Emotional Intelligence into the educational process is considered an effective way to support students' development (Riyanti et al., 2024). Notably, students with higher Emotional Intelligence often achieve better academic results due to stronger interpersonal skills, greater stress management capacity, and higher intrinsic motivation (Shengyao et al., 2024).

Students' achievement is typically measured using standardized test scores, which play a crucial role in shaping their future career and life opportunities (Kumar, 2021). Therefore, in recent years, an increasing number of studies have identified emotional intelligence as a key factor influencing students' achievement, and enhancing students' emotional intelligence has gradually become a research direction in instructional design (Tirajaya et al., 2024).

However, developing students' Emotional Intelligence remains a significant challenge in many educational settings. In China, both parents and educators often place greater emphasis on academic performance rather than on emotional or social development (S. Wang & Luo, 2024). As a result, many students show weaknesses in those areas such as emotion regulation, empathy, and interpersonal communication. This heavy focus on grades can hinder emotional growth and leave students less prepared to manage complex social and emotional situations (Eduljee et al., 2024). Addressing this imbalance requires a shift in both educational priorities and instructional approaches.

To promote the development of students' Emotional Intelligence and improve their academic achievement, educators need to adopt more innovative and effective instructional interventions. Optimizing classroom processes is considered a key factor in enhancing learning outcomes (Sana et al., 2020). Research has shown that self-directed learning strengthens students' sense of ownership over their learning goals, enabling them to plan their progress actively and engage in continuous reflective practices, which in turn contributes to better achievement (Sriwisathiyakun, 2024). At the same time, blended learning—by combining the flexibility of online tools with the interactivity of face-to-face instruction—creates a more adaptive and personalized learning environment. This learner-centered approach not only increases students' engagement but also fosters a stronger sense of autonomy and responsibility (Hubackova & Semradova, 2016). Moreover, blended learning environments play a positive role in supporting both cognitive development and emotional growth (Vejyaratnam et al., 2023).

Music education is considered one of the effective ways to improve Emotional Intelligence (Varadi et al., 2024). Research shows that music education has a positive impact on emotional regulation, mental health, social skills, and cognitive development (Hallam, 2010; Zhan, 2025). As a distinctive branch of music, Intangible Cultural Heritage (ICH) music offers students a rich blend of cultural and emotional experiences. Through generations of inherited music melodies and lyrics, it inspires students' empathy, emotional cognition, and emotional expression of national culture, thereby achieving Emotional Intelligence growth in aesthetics (Wang et al., 2022).

This study aims to address the dual challenge of enhancing Emotional Intelligence (EI) and achievement through an innovative intervention. The approach integrates self-directed learning (SDL) and Blended Learning (BL) into the context of Intangible Cultural Heritage (ICH) music education. It is designed to provide Chinese youth with a personalized, purposeful, planned, and developmental learning experience as well as offer higher education a new pathway to explore teaching models that integrate emotional and cognitive development. The following two research questions guided the study:

1. What are the steps of the SDBL model for ICH music education?
2. How does this SDBL model affect the EI and achievement?

LITERATURE REVIEW

Self-directed Learning

Self-directed learning is a critical competence in the digital age and an essential skill for achieving continuous development (Sriwisathiyakun, 2023). Traditional education primarily focuses on knowledge transmission, where teachers lead the learning process. In contrast, SDL requires learners to take initiative by setting learning

objectives, selecting resources, scheduling learning progress, adjusting learning strategies, constructing evaluation mechanisms, and seeking feedback. Learners assume many responsibilities traditionally held by teachers in supervised learning environments (Robinson & Persky, 2020a). This shift from passive to active learning not only increases learners' engagement but also fosters the development of autonomous learning skills.

Current research on Self-directed Learning (SDL) has established a multidimensional theoretical framework. Torabi et al. (2013a) categorized self-directed learning into three key dimensions: self-management, willingness to learn, and self-regulation. These encompass goal-setting, efficient time management, proactive information-seeking, task execution, and outcome evaluation. Sawatsky et al. (2017a) proposed a cyclical SOL model comprising six progressive stages: firstly, learning begins with a trigger that activates motivation based on a specific need; secondly, the learner identifies gaps in their knowledge through cognitive reflection; thirdly, based on this, the learner formulates learning objectives; then, the learner actively gathers and organizes resources; then, the learner applies the acquired knowledge in practice; finally, learning outcomes are examined through reflection and evaluation. The function of each stage of the model independently yet remains connected to the others. In particular, the results of evaluation directly influence the next trigger, highlighting the adaptive and dynamic nature of self-directed learning.

Silamut & Petsangri (2020a) developed a four-tiered structured self-directed learning (SDL) framework through synthesizing findings from interdisciplinary studies spanning 1975-2019, including seminal works by Knowles (1975), Song and Hill (2007), Ambrose et al. (2010), Brockett & Hiemstra (2018): (1) Motivation Activation; (2) Goal Setting and Planning; (3) Learning Actions; (4) Learning Evaluation. This model highlights that evaluation outcomes directly drive the emergence of new learning motivation, forming a closed-loop system of "needs identification – action implementation – feedback refinement."

Charokar & Dulloo (2022) outlined a five-step instructional model for self-directed learning: identifying where learning is lacking, setting appropriate learning targets, finding useful people and materials, selecting suitable approaches and carrying them out, and finally reviewing the learning outcomes. The model emphasizes the learner's active role and self-regulation throughout the process, offering a practical way to support student-centered learning.

Table 1. Steps of Self-directed Learning

Steps of SDL	Robinson & Persky (Robinson & Persky, 2020b)	Sawatsky. (Sawatsky et al., 2017b)	Silamut & Petsangri (Silamut & Petsangri, 2020b)	Torabi et al (Torabi et al., 2013b)	Charokar & Dulloo (Charokar & Dulloo, 2022)	Total
Diagnosing the learning gaps		√			√	2
Cognitive Gap Detection		√				1
Set Learning Goals	√	√	√	√	√	5
Develop a Learning Plan			√	√	√	3
Time management	√					1
Select Appropriate Learning Resources	√	√		√		3
Learning activities	√	√	√	√	√	5
Assessment	√		√	√	√	4
Feedback	√	√				2
Total	6	6	4	5	5	

Table 1 presents the learning design steps proposed by the above researchers. To enhance the clarity, coherence, and adaptability of the instructional experiment, this study first removed the less frequently mentioned steps and then revised, renamed, and merged the remaining ones. The initial steps of "setting learning

goal” and “formulating learning plans” are simplified to “Setting Learning Target” and “Making Plan”, highlighting the logical progression between the steps; “selecting appropriate learning resources” is defined as “Gathering Information”, encompassing the processes of identifying, analyzing and integrating resources; “applying learning strategies” is defined as “Learning Activities”, focusing on the actual participation in learning; “evaluation and reflection” are combined into “Conducting Post-Lesson Reflections”, covering both outcome assessment and process reflection to achieve continuous improvement. These adjustments not only preserve the essence of the self-directed learning steps but also ensure that they are more concise, easier to understand and put into practice.

Table 2. Key Steps of Self-directed Learning

Steps	Description
1. Setting Learning Target	Define a clear learning target
2. Making Plan	Develop a strategy to achieve the target
3. Gathering Information	Gather relevant resources and materials
4. Learning Activities	Engage in structured tasks
5. Conducting Post-Lesson Reflections	Evaluate progress and adjust strategies as needed

Blended Learning

Blended Learning is a teaching approach that combines online digital instruction with traditional face-to-face methods, widely recognized for enhancing learners’ engagement and academic performance (Joshi et al., 2023; R. Wang, 2023; Alrasheedy et al., 2025; Saritepeci & Cakir, 2015). Driscoll (2002) defined Blended Learning through four key dimensions: utilizing internet-based tools in instruction, applying diverse teaching approaches, combining digital resources with in-person guidance, and connecting learning with real-life contexts. In the Handbook of Blended Learning (Bonk & Graham, 2012a), Professor Curtis J. Bonk from Indiana University described blended learning as a systematic integration of face-to-face instruction and computer-mediated learning, emphasizing its synergistic relationship with technological advancements. Fathoni (2018) argued that exclusive reliance on face-to-face instruction may disadvantage students with visual or auditory learning preferences, whereas blended learning optimizes engagement and efficiency by combining modalities. Anthony et al. (2019) further demonstrated blended learning’s adoption in higher education by bringing together in-person and digital teaching approaches. Their studies emphasize that combining classroom interaction with online tools can lead to better learning outcomes. Blended Learning goes beyond simply adding technology because it involves a deliberate restructuring of instruction based on learners’ needs and educational settings (Hill & Smith, 2023).

Table 3. Steps of Blended Learning

Steps of BL	Bonk & Graham, (Bonk & Graham, 2012b)	Driscoll, (Driscoll, 2002b)	Fathoni (Fathoni, 2018b)	Anthony et al. (Anthony et al., 2019b)	Total
Online individual learning	√	√	√	√	4
Online group interaction	√			√	2
Offline face-to-face in classroom	√	√	√	√	4
Offline interaction with teacher and classmates	√	√		√	3
Total	4	3	2	4	

In Table 3, the steps of Blended Learning are listed based on the literature. The study by Chen and Pan (2023) demonstrated how the blended teaching method, which integrates online pre-learning with offline classroom discussions, significantly optimized teaching effectiveness. Furthermore, Peng and Fu (2021) confirmed that the combination of online and offline teaching models can substantially improve students' learning motivation and achievement. Based on the above summary and case studies, this study applied a Blended Learning approach that combines both online and offline teaching methods. The content of these steps is provided in Table 4.

Table 4. Blended learning key steps

Components	Description
Online learning	Students individual learning and group interaction
Offline learning	Face-to-face classroom interaction with teacher and classmates

Emotional Intelligence (EI)

Emotional intelligence (EI) is widely regarded as a critical 21st century skill. It encompasses the ability to recognize one's own emotions, understand others' feelings, regulate emotional responses, and cultivate healthy interpersonal relationships (Goleman & Boyatzis, 2017). Research indicates that students with higher Emotional Intelligence typically achieve better academic performance, cope more effectively with stress and setbacks, and build positive relationships with others (AL-Qadri & Zhao, 2021; Halimi et al., 2021; Ononye et al., 2022).

Despite its significance, Emotional Intelligence development is frequently neglected in educational contexts. Excessive academic pressure can impede the cultivation of empathy, self-awareness, and emotional regulation, resulting in increased stress levels, interpersonal difficulties, and diminished self-confidence (Ullah et al., 2023; Toscano-Hermoso et al., 2020). Building Emotional Intelligence can help students do better in school, succeed in their future careers, and lead more balanced lives. For this reason, it deserves more attention in education (Al Jaber et al., 2024; Pirsoul et al., 2023). Emotional Intelligence (EI) has been categorized into three main models: the ability model, mixed model, and trait model, as defined by researchers like Bar-On (1997), Goleman (1999), Petrides & Furnham (2001), Salovey & Mayer (1990). Most models view Emotional Intelligence as two main aspects: one is to handle one's own emotions, and the other is to understand and respond to the emotions of others. Kanesan and Fauzan (2019) suggested that the ability-based model offers the clearest explanation of Emotional Intelligence. Mayer et al. (2016; Salovey & Mayer, 1990) described Emotional Intelligence through a four-branch structure, which includes recognizing emotions, applying them to support thinking, interpreting emotional signals, and regulating one's emotional responses. Goleman and Boyatzis (Goleman & Boyatzis, 2017) proposed an alternative four domain structure—self-awareness, self-management, social awareness, and relationship management—each of which contains a set of 12 specific skills linked to performance and leadership. Similarly, MacCann et al. (2020) outlined a hierarchical model with four branches. They are focusing on emotional recognition, using emotions to guide decision-making, understanding emotional patterns, and managing both positive and negative emotional states. A summary of these EI components is provided in Table 5.

Table 5. Steps of EI

Components	Goleman & Boyatzis (Goleman & Boyatzis, 2017)	Mayer et al., (Mayer et al., 2016)	MacCann et al.,(2020)	Total
Emotional Perception	√	√	√	3
Facilitating Thought using Emotion	√	√	√	3
Emotional Understanding		√	√	2
Emotion Management	√	√	√	3
Self- Management	√			1
Self-Awareness	√			1
Social Awareness	√			1
Relationship Management	√			1
Facilitating Thought Using Emotion	√			1
Total	7	4	4	

The selection of emotional perception, emotional understanding, emotional management, and relationship management as the steps of emotional intelligence (EI) in this study is based on their high usage across existing research and their relevance to the characteristics of music learning. Emotional perception and understanding are critical in identifying and interpreting emotional cues, which align closely with recognizing emotions in music speech. Research indicates that emotional cues in music are similar to those in speech, suggesting shared underlying processes (Juslin & Laukka, 2003). Emotional management and relationship management, on the other hand, emphasize regulating emotions and fostering interpersonal connections, both of which are integral to collaborative activities like music. Furthermore, a music curriculum has been shown to effectively enhance emotional wellness (Yang, 2023). These four steps not only reflect key dimensions of EI but also resonate with the expressive and interactive nature of music learning, making them suitable for this study.

Achievement

Achievement, commonly evaluated by indicators such as Grade Point Average (GPA) and final grades, is understood as the learner's capacity to complete academic tasks effectively (Domenech-Betoret et al., 2017; Fuertes et al., 2023; Chigbu & Nekhwevha, 2021). Achievement reflects more than just task completion, but also indicates a student's cognitive growth (P. Peng & Kievit, 2020), learning skills (Hassanbeigi et al., 2011), and depth of understanding (Adams, 2015). In college-level Intangible Cultural Heritage (ICH) music courses, strong achievement suggests not only knowledge of music, but also a well-rounded ability in cultural awareness, aesthetic judgment, and emotional expression (Altugan, 2015). It helps deepen students' understanding of cultural diversity, strengthen their sense of identity with their own heritage, and encourage their active participation in cultural preservation and transmission (Bing et al., 2024). Strong academic achievement is often accompanied by increased motivation, greater classroom engagement (Li & Xue, 2023). For the course itself, improved students' achievement also serves as important feedback on the effectiveness of the teaching model and methods (Ajmal et al., 2024).

The culture-based arts education also has a positive effect on international students' academic performance. Taking part in culture-rich programs can strengthen their sense of belonging. This is a key factor for international students to achieve academic success, especially when learning includes extra-curricular cultural activities and community involvement, similar to Intangible Cultural Heritage (ICH) music courses (Glass & Westmont, 2014). It has been shown that arts-based interventions and social-emotional learning (SEL) interventions can steadily improve standardized academic results and core subject performance. What's more, music-integrated

teaching can also greatly help math learning. (J. Crawford et al., 2024)(Durlak et al., 2011a). All these findings show that ICH music can strengthen students' sense of belonging, intercultural ability and socio-emotional skills. In this way, it indirectly improves international students' overall academic performance.

Intangible Cultural Heritage (ICH) Music

Music serves not only as a medium for emotional expression and regulation, but also cultivates empathy and emotional awareness(Wu & Lu, 2021). Intangible Cultural Heritage (ICH) music refers to the musical forms passed down from generation to generation within a specific cultural group and is an important component in maintaining the diversity of human culture(Gwervevende & Mthombeni, 2023). According to the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage(Convention for the Safeguarding of the Intangible Cultural Heritage, 2003), Integrating elements of intangible cultural heritage into the education system is an important way to preserve and pass on traditional culture.

Universities can serve as platforms for cultural transmission, preserving, studying, and revitalizing traditional music within the framework of modern education(de-Miguel-Molina et al., 2021). When students learn music, they better understand its cultural roots, history, and social meaning. This helps them grow emotionally and understand feelings better (Vereshchahina-Biliavska et al., 2024). Using technology like online classes for traditional music education shows good potential (Dagnino et al., 2015). These new teaching methods make cultural resources easier to access, get more students involved, and bring fresh ideas to music teaching (Schmidt, 2023).

In China, national-level intangible cultural heritage items are selected based on the country's Intangible Cultural Heritage Law (2011). The law focuses on four key points: firstly, their importance in history and culture; secondly, being actively passed down to new generations; thirdly, being widely valued by society; fourthly, being good examples of their kind. In Shanxi Province, 18 traditional music forms have been added to this important national list.

This course focuses on four main traditional music styles from Shanxi: Kaihualiao, Jiangzhou Drum Music, Jinnan Weifeng Gong and Drum, and Shangdang Bayin Hui. These four music examples include both singing and instrumental traditions from Shanxi. They show the different music styles from central, south and southeast parts of the province. They are very expressive and full of feeling. This makes them perfect for teaching students about how to appreciate music and how to understand emotions through music.

METHODS

This study employed a two-phase research design:

Phase 1: Development of Self-Directed Learning and Blended Learning (SDBL) Model

Phase 2: Experimental evaluation of the model's impact on students' EI and achievement

Phase 1: Development of Self-Directed Learning and Blended Learning (SDBL)

Participants

A panel of five experts in Open and Distance Learning and higher education evaluated the SDBL model. All experts had a minimum of five years of teaching experience in these fields.

Model Development

The SDBL model was developed through a comprehensive literature review of self-directed learning and blended learning framework. The model integrates: 1. Five core steps of self-directed learning. 2. Both online and offline components of blended instruction. As illustrated in Figure 1, this integrated model formed the foundation for the subsequent teaching experiment and practical application.

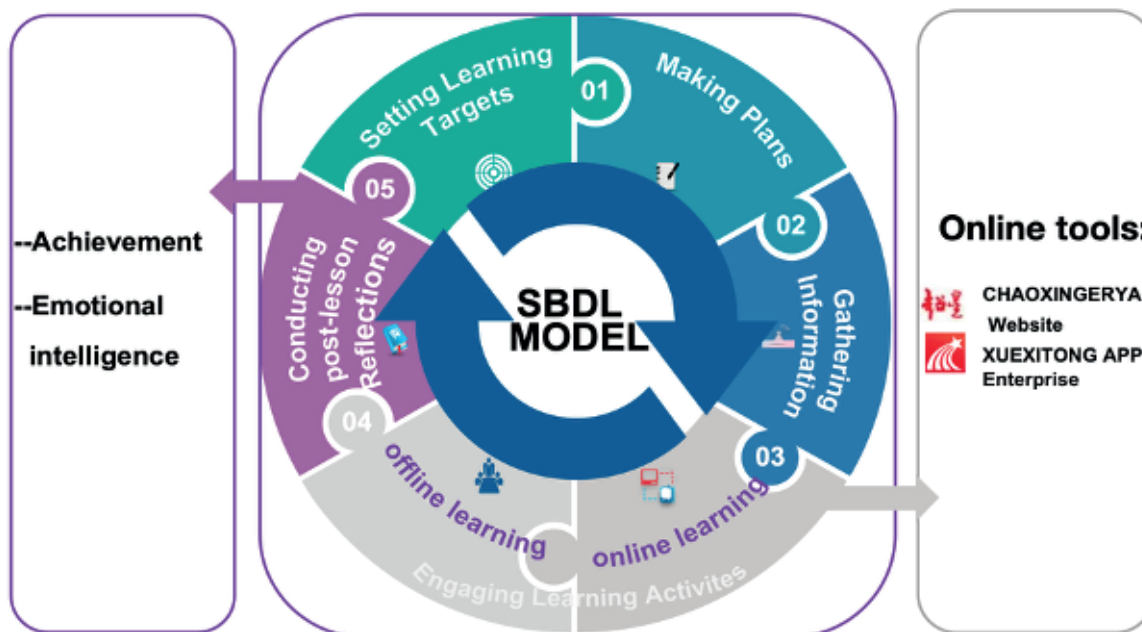


Figure 1. SDBL model

Students go through five sequential phases:

Step 1: Setting Learning Targets

Learners develop their weekly learning goals by integrating their individual learning needs and abilities with the learning objectives.

Step 2: Making Plans

Learners create their learning plans by breaking down goals, effectively managing time, and selecting appropriate resources and methods.

Step 3: Gathering Information

Learners can access teacher-prepared Small Private Online Courses via the course's online platform and search for other educational resources related to the learning objectives.

Step 4: Engaging In Online and Offline Learning Activities

The learning activities are divided into two parts:

Online: Learners complete the tasks assigned by the teacher, collaborate with peers to finish interactive group assignments, and prepare for class presentations and discussions.

Offline: Learners and teachers engage face-to-face activities, including groups presenting, teachers providing feedback, explanations, and students answering questions.

Step 5: Conducting Post-Lesson Reflections

Students reflect on feedback from teachers and peers, assess whether they have met the learning objectives, and consider if the adjustments to their learning methods and pace are necessary.

Online tools: Chaoxing Erya web and Xuexitong app

Chaoxing Erya is an online education provider recognized by the Taiyuan University of Science and Technology, where the researchers are affiliated. Before classes begin, teachers create intangible cultural heritage (ICH) music courses on the platform and upload informational resources, including text and video materials, for four Chinese ICH projects: Zuoquan Folk Songs, Xinjiang Drum Music, Jinnan Mighty Gongs and Drums, and the Eight Sounds Ensemble. Additionally, teachers upload post-test questions, with scores and analyses automatically generated by the platform. Students could log in to their accounts to access assigned learning tasks and related materials anytime, anywhere.



Figure 2. Learning interface of Chaoxing Eya online

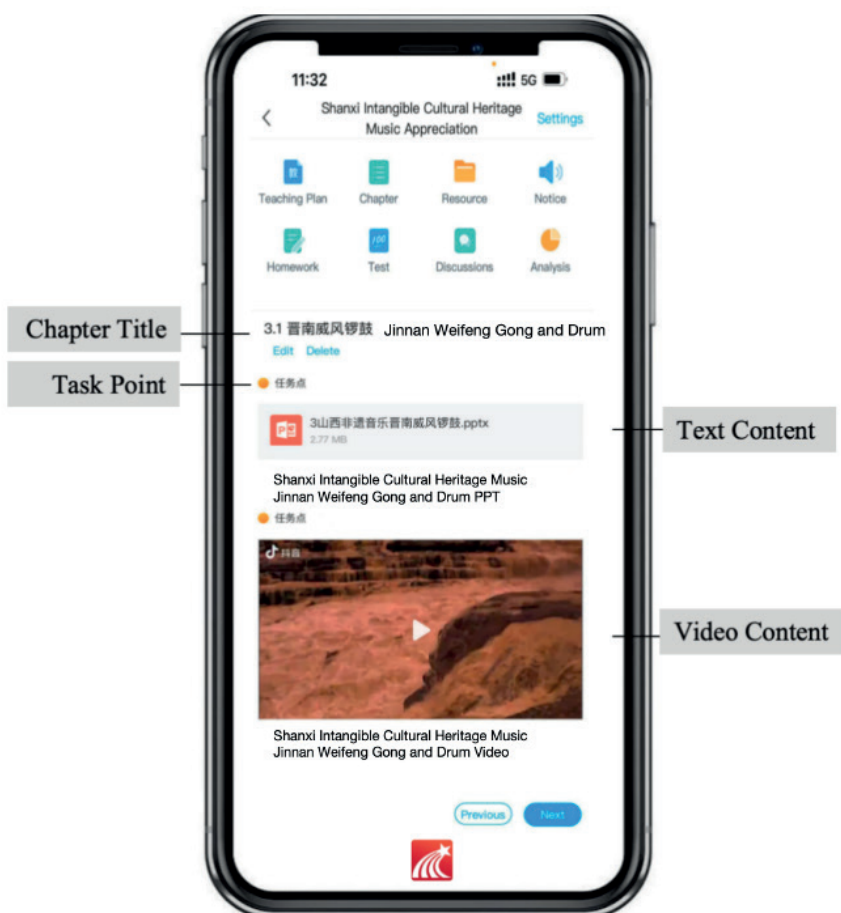


Figure 3. Learning interface of XueXiTong online

Data Analysis

This study employed a Model Quality Assessment to evaluate the SDBL model, using a five-point Likert scale (1 = very unsuitable, 5 = very suitable). The assessment yielded an average score of 4.84, with a standard deviation of 0.249, indicating strong expert consensus regarding its relevance and applicability. These results demonstrate the model's robust structure, methodological soundness and practical value for intangible cultural heritage (ICH) music education, as well as its potential to enhance Emotional Intelligence (EI) and achievement. (Table 8. Quality of SDBL Model)

Phase 2: Experimental Evaluation of the Impact of the Model on Emotional Intelligence and Achievement of Students

Participants

This study involved undergraduate students from Taiyuan University of Science and Technology. While the university specializes in engineering programs and doesn't offer music majors, students can still take music appreciation courses as electives.

The study included students from all four years (freshmen to seniors) who were not studying music. These students chose to take the "Shanxi Traditional Music Appreciation" class through the school's normal course sign-up system. This art class was available to any student in the university regardless of their academic background. Students could pick this class simply because they liked it.

We divided the 112 students who signed up for the "Shanxi Traditional Music Appreciation" course into two equal groups (56 in each), one experimental group and one control group, randomly assigned through the school's registration system. The students ranged from freshmen to seniors aged 19-22, with 62.5% boys male and 37.5% girls female coming from both urban and rural areas, and 96 of them had never taken a traditional music course before. Detailed demographics are presented in Table 6.

This study received ethical approval from the School of Arts, Taiyuan University of Science and Technology (Approval Number: 20240901) Before we began, we explained the study's goals and methods to all students. Each student signed a consent form agreeing to participate. And we kept all information private and only used it for this research.

Table 6. Participant information

Demographic Aspects	Number		Percentage	
	Experiment	Control	Experiment	Control
Gender				
Male	34	36	61	64
Female	22	20	39	36
Age				
19 years old	10	8	18	14
20 years old	30	31	53	56
21 years old	14	13	25	23
22 years old & above	2	4	4	7
Address				
City	22	20	40	36
Rural	34	36	60	54
ICH music experience				
none	47	46	84	82
Yes	9	10	16	18

Experimental Design

This study integrates intangible cultural heritage (ICH) music into the SDBL model to examine its effects on students' academic achievement and emotional intelligence (EI). Students were randomly divided into experimental and control groups (56 students per group) using the university's course registration system, which employed computer-generated random numbers for allocation. The Academic Affairs Office managed this process, ensuring that neither the students nor the instructor knew the group assignments before the intervention.

To maintain teaching consistency, the same instructor taught both groups using identical materials. The instructor was a university lecturer specializing in music education and cultural heritage studies, with over ten years of higher education teaching experience.

After the six-week teaching period, both groups completed an EI questionnaire and a course exam. The experimental design is shown in Figure 4.

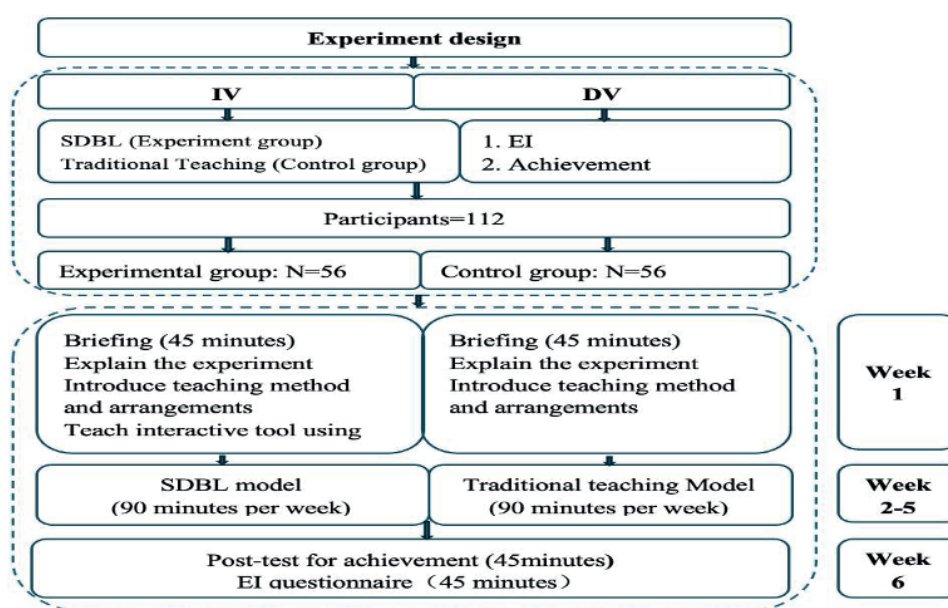


Figure 4. Experimental design.

Experiment Procedure

In the experimental design, the instructor was a university lecturer specializing in music education and cultural heritage studies, who had over ten years of teaching experience in higher education.





In the first week, at the beginning of the teaching session, the teacher spent 45 minutes explaining the learning objectives, teaching process, and methods to the students.

From weeks 2 to 5, the control group followed traditional teaching methods, ensuring consistency in teaching content and the same instructor. Meanwhile, the experimental group adopted the SDBL teaching model. Before class, students set their own learning goals and plans. On the learning platform, they accessed teacher-uploaded materials such as PPTs, videos, and audio files. Additionally, they used other platforms like Douyin, and Xiaohongshu apps and websites to gather learning resources and collaborate with peers to complete pre-class group discussion reports. During face-to-face sessions, students presented their discussion results in groups, with the teacher providing on-the-spot feedback and answering questions. Finally, students reflect on whether the learning objectives have been achieved and determine the necessity of adjusting learning methods and progress.

In the sixth week, students completed a 45-minute test on their knowledge of intangible cultural heritage music and its work analysis, along with an EI questionnaire survey. The study was designed and implemented by the researchers, applying the full SDBL model over a six-week intervention period.

The objectives of the Shanxi ICH music course were developed with reference to Bloom’s Taxonomy of Cognitive Objectives (Bloom et al., 1956), the KSA framework of instructional design (Harden, 2002), Goleman’s theory of Emotional Intelligence (Goleman, 1999), and the Opinions on Further Strengthening the Protection of Intangible Cultural Heritage into the national education system (2021). These objectives focus on three key areas: first, helping students better understand traditional music and improve their ability to appreciate music; second, teaching them to respect different cultures; third, developing their emotional awareness throughout the learning process.

Table 7. Shanxi ICH music appreciation course

<p>Objectives</p>	<p>Knowledge: Students will learn about different types of traditional Shanxi music, their unique features, basic concepts, historical backgrounds, and cultural significance.</p> <p>Attitude: Students will develop an appreciation for diverse musical expressions while learning to recognize and manage their emotional responses during music listening activities</p> <p>Skill: Students will practice identifying emotions in traditional music, understanding their cultural context, and effectively communicating these emotional interpretations with classmates to strengthen their emotional awareness.</p>	
	<p>There are three types of Shanxi ICH music: Folk, Gong and Drum Music, Suona Music (suona, a traditional Chinese double-reed horn)</p> <ol style="list-style-type: none"> 1. Kaihua Diao (Flowering tune) is a representative example of Shanxi folk song. Every lyric talk about flowers, using flower images to describe local life and love stories. 2. Jiangzhou Drum Music is a traditional performance from Xinjiang County, Shanxi, combining drumming and wind instruments. Dating back to the late Stone Age, this music comes in many styles with lots of different pieces. The most famous include Huacao Drum, “Chuanxiang Gong and Drum,” and “Chegu.” 	 <p>Figure 5. Kaihuadiao</p>  <p>Figure 6. Jiangzhou Drum</p>
<p>Specifics</p>	<ol style="list-style-type: none"> 3. Jinnan Weifeng Gong and Drum is a traditional percussion art using four instruments: gongs, drums, naos, and cymbals. It combines music, dance, and performance skills to show the bold, free-spirited character of men from China’s Loess Plateau. 4. The Shangdang Bayin Hui (“Eight-Tones Ensemble”) is a traditional instrumental performance popular in southeast Shanxi Province, especially in Changzhi and Jincheng. Its name comes from using eight main instruments: drums, gongs, cymbals, sheng, xiao, flute, and guan. People typically perform this music at temple fairs, festivals, weddings, and funerals. 	 <p>Figure 7. Jin’nan Weifeng Gong and Drum</p>  <p>Figure 8. Shangdang Bayin Hui</p>
<p>Challenges</p>	<p>One of the biggest challenges in ICH music education is helping modern students connect with traditional cultural music. We need to find ways to make these ancient musical traditions meaningful and engaging for young people today, so they can truly appreciate this cultural heritage, feel emotionally connected to it, and develop greater respect for diverse cultural expressions.</p>	

The Shanxi ICH Music Appreciation course was mainly designed for domestic students, but its structure and resources also support international and exchange students. For non-Chinese speakers, English supplementary materials were provided, such as bilingual lecture slides, translated lyrics, and cultural background notes. This inclusive approach helps international students engage with and understand the content while maintaining the course’s effectiveness for a diverse student population.

Table 8. Shows of the model implementation in the experiment activities

Setting Learning Targets

Students work with their teacher to set personal learning goals based on the course content and emotional learning guides. To help students create clear, meaningful goals, teachers provide templates and individual feedback. This ensures every student’s goals are: 1) personally meaningful, 2) connected to course learning, and 3) trackable. See Figure 9 for examples of both the teacher’s target-setting guides and Figure 10. Student Learning targets Setting

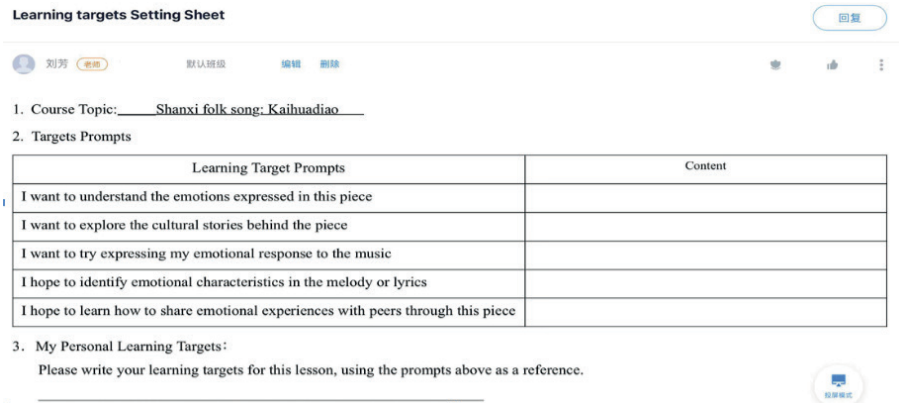


Figure 9. Teacher target-setting guides

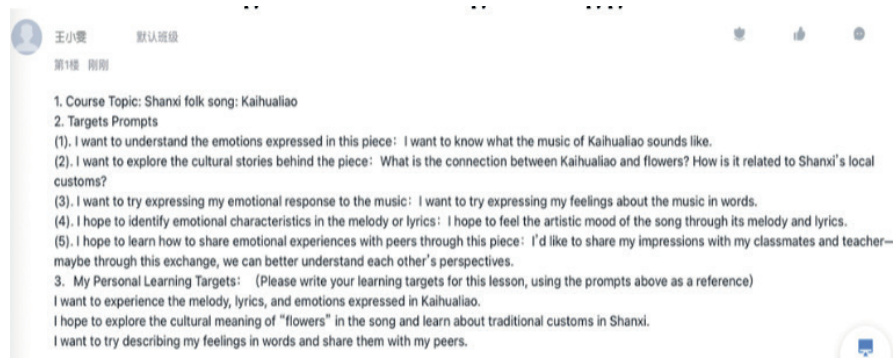


Figure 10. Student Learning targets Setting

Students formulate making learning plans based on their personal learning targets.

Making Plan

Content	Kaihuailiao
Resources	University learning platform, Douyin, Bilibili, Xiaohongshu, etc.
Schedule	1. Organize materials, experience the music, understand its cultural background, and write a reflection (30 minutes) 2. Share knowledge, insights, and emotional responses to the music and its background with peers (30 minutes) 3. Present learning outcomes in the offline class and raise any questions encountered during the learning process.
Reflection	1. Conduct self-assessment based on the set learning goals, including the level of musical understanding and emotional expression ability. 2. Identify areas for improvement, and record both gains and shortcomings.

Figure 11. Student Making Plan

Gathering Information

In the information-gathering process, students use modern online platforms (such as Douyin, Bilibili, and Xiaohongshu etc.) to gain a perceptual understanding of the music through videos, while also consulting library collections, local chronicles, ICH research literature, and academic journals to develop a systematic understanding of the works and their cultural background.

Online class:

1. Students use platforms such as Chaoxing Er Ya and Learning Pass to access text and video materials provided by the instructor on Shanxi Intangible Cultural Heritage (ICH) music projects. Guided by specific questions—such as “Why was this type of music so popular in its time?” and “What emotions did you feel from the piece?”—students explore the artistic style, cultural background, and emotional characteristics of the works.

2. Group Work: Students work in groups to discuss assigned intangible cultural heritage (ICH) topics online. Together they create reports analyzing the music’s structure and emotional content. By sharing their personal thoughts and feelings about the music, they develop both thinking skills and emotional understanding at the same time.

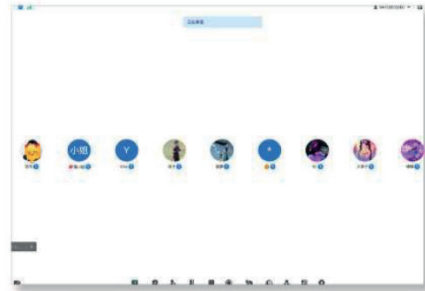
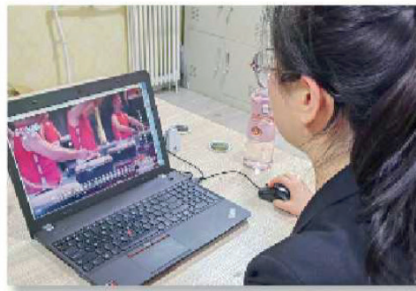
Learning Activities

Figure 12. Online class

Offline class:

During class presentations, each student group shares their project reports. As they present, the teacher adds important information to help explain things better and shows students different ways to understand both the music itself and the feelings it expresses. This presentation time helps students in two important ways: first, it lets them practice putting their own feelings about the music into words, and second, it teaches them to really listen to how others feel about the music. These activities help students learn to understand others’ feelings better and manage their own emotions. At the end of class, there’s a special sharing activity where each student talks about which song lyric or melody “touched them the most.” This helps students link the emotions in the music to their own life experiences, which works on both their thinking skills and their emotional skills at the same time.



Figure 13. Offline class

Conducting Post-Lesson Reflections

At the end of the lesson, students look back at what they’ve learned. They check if they’ve reached the personal goals they set at the beginning. They think about two main things: how well they understand the music, and how clearly, they expressed their feelings about it. After this check, they make plans to do better next time. They might change how they study or practice to understand the music more deeply and connect with it better emotionally.

Instruments

In the final week of the experiment, post-tests were conducted for both intangible cultural heritage (ICH) music and emotional intelligence (EI). The ICH music post-test questions were sourced from the Digital Museum of Chinese Intangible Cultural Heritage (<https://www.ihchina.cn/#page9>), supervised by the Ministry of Culture and Tourism of the People's Republic of China and organized by the Chinese Academy of Arts, ensuring professionalism and authority. The content was selected from four national-level ICH music projects within the Shanxi province, where the host institution, Taiyuan University of Science and Technology, is located. The test consisted of 20 multiple-choice questions, each with 4 options and 1 correct answer, totaling 100 points. Grading was conducted by course instructors. Index of Item-Objective Congruence (IOC) for the 20 post-test items ranged from 0.8 to 1.00, indicating high consensus among experts regarding the validity of the content. Before the experiment, a pilot test was administered to 30 students, yielding a Cronbach's Alpha coefficient of 0.94, demonstrating high reliability and consistency in measuring the intended objectives. Students completed the test within 45 minutes; therefore, the post-test duration was set at 45 minutes.

This study utilized an emotional intelligence (EI) measurement scale based on SSETT (Schutte et al., 1998), comprising 25 test items that cover four core dimensions: emotional perception, emotional understanding, emotional management, and relationship management. To ensure the validity of the scale, five experts from the fields of educational technology, higher education, and music were invited to participate. They assessed the scale using the Index of Item-Objective Congruence (IOC), achieving scores ranging from 0.6 to 1. Before the formal testing, a pre-test involving 30 students confirmed high internal consistency with a Cronbach's Alpha coefficient of 0.96, demonstrating its robustness and applicability to the research objectives.

Data Analysis

This study employs Multivariate Analysis of Variance (MANOVA) to examine whether there are significant differences in EI levels and academic performance between the experimental group and the control group. If the significance level is less than 0.05, it indicates that this learning model significantly enhances students' EI and academic performance. Furthermore, if the p-value from the correlation analysis is <0.001 , it suggests a significant positive correlation between academic performance and EI improvement. Students completed the post-test within 45 minutes, so the duration of the EI test was set to 45 minutes.

RESULTS

Quality of SDBL Model

To evaluate the effectiveness and applicability of the SDBL model in intangible cultural heritage (ICH) music education, five experts were invited to conduct an assessment. Using a five-point Likert scale, they rated various aspects of the model. The results were analyzed based on the average score for each item, with the mean values interpreted as follows: 4.50-5.00 was the highest; 3.50-4.49 was high; 2.50-3.49 was moderate; 1.50-2.49 was low; 1.00-1.49 was the lowest. The evaluation results are presented in the following table 9.

Table 9. Quality of SDBL Model

No	Assessment items	Expert's Evaluation		
		X	S.D.	level
Model Evaluation				
1	The SDBL model is suitable for meeting adolescent/adult learners (e.g., flexibility in learning time, location, and methods).	4.8	0.40	high
2	The SDBL model includes key components: target, plan, information, learning activity, and reflection, among them learning activities include online and offline.	5	0.00	high
3	The SDBL model promotes the improvement of learners' self-directed learning abilities.	4.8	0.40	high
4	The SDBL model supports online and offline learning, teacher-student interaction, and peer learning in blended learning.	4.8	0.40	high
5	The SDBL model contributes to enhancing learners' emotional intelligence (EI) and academic performance.	4.8	0.40	high
Average		4.84		high
Course and Model Evaluation				
6	The SDBL model is suitable for learning intangible cultural heritage (ICH) music.	5	0.00	high
7	The course design, themed around intangible cultural heritage music projects, follows logical and coherent principles.	4.8	0.40	high
8	Learners can conveniently access course resources through platforms such as Chaoxing Erya web and Xuexitong app.	5	0.00	high
9	The SDBL model effectively enhances students' understanding of the cultural and artistic characteristics of ICH music.	4.8	0.40	high
10	There is a clear and easy-to-implement evaluation mechanism (e.g., EI questionnaire, post-tests) to measure experiment outcomes.	4.6	0.49	high
Total average		4.84		high

As shown in the table 8, the experts' evaluation of the model and the integration of the course with the model received an average score of 4.84. The experts' evaluation strongly supports the structure, methodology, and application of the SDBL model in intangible cultural heritage (ICH) music education. The data indicates a widespread recognition of the model's potential to significantly enhance emotional intelligence (EI) and achievement.

Experimental Data Analysis

We used a cluster random sampling method to select two classes from the Intangible Cultural Heritage Music Appreciation course at Taiyuan University of Science and Technology. The control group consisted of 56 students, and the experimental group also consisted of 56 students. Each group exceeded 40 participants, so normality tests were not required (Montgomery & Runger, 2011). Furthermore, since the sample sizes of all groups are equal, there is no need to test the equality of the variance-covariance matrix. The experimental results are shown below.

To determine if there was a significant difference between the experimental and control groups concerning learning achievement and emotional intelligence (EI), we conducted a Multivariate Analysis of Variance (MANOVA) on these two dependent variables. Initially, we performed the Box M test, with results presented in Table 9, where the Sig value was 0.190, higher than 0.05, indicating that the covariance matrices were equal. To further confirm the correlation between the two dependent variables, we conducted Bartlett's test of sphericity, which yielded a Sig value of less than 0.001, lower than 0.05, indicating there is a relationship between the two variables.

Table 10. Result post-testing of achievement and EI

DV	Box's Test of Equality of Covariance Matrices					Bartlett's Test of Sphericity		
	Box's M	F	df1	df2	Sig.	Approx. Chi-Square	df	Sig.
Post-test & EI	4.858	1.587	3	2178000.000	0.190	271.858	1	<0.001

Table 11. Post-testing the dependent variable

	Effect	Value	F	Sig.
Group	Pillai's trace	0.447	43.985	<0.001
	Wilks' lambda	0.553	43.985	<0.001
	Hotelling's trace	0.807	43.985	<0.001
	Roy's largest root	0.807	43.985	<0.001

Table 12. Comparison of the result of post-test score and EI

DV	IV	n	X'	SD	Levene's test		Tests of Between-Subjects Effects				Compare between groups
					W	Sig	Mean Square	MS	F	Sig	
Ach	C	56	79.82	8.14	0.80	0.37	1808.04	288.80	33.47	< 0.001	E>C
	E	56	87.86	7.36				5.57			
EI	C	56	94.98	8.49	0.94	0.33	3830.58	510.05	60.57	< 0.001	E>C
	E	56	106.68	7.36				38.64			

According to results of Levene's test from Table 11, the significance (Sig.) values for the post-test scores and EI in the control and experimental groups were 0.37 and 0.33, respectively, higher than 0.05, thus confirming the homogeneity of variance.

The Tests of Between-Subjects Effects significance value for the post-test scores was < 0.001, and EI was < 0.001, both lower than 0.05. This indicates a significant difference between the experimental and control groups in the two dependent variables of learning scores and decision-making skills. The specific differences can be compared and analyzed based on the mean and variance in the table. For the post-test scores, the experimental group's mean score (mean=87.86, SD=7.36) was significantly higher than that of the control group (mean=79.82, SD=8.14). Similarly, for EI, the experimental group's mean score (mean=106.68, SD=7.36) was also significantly higher than that of the control group (mean=94.98, SD=8.49). The above data indicate that the experimental group achieved higher scores than the control group in post-test scores and EI, with no significant difference in pretest results. The above data indicates that the experimental group achieved higher scores than the control group in post-test scores and EI, with no significant difference in pretest results. There was a significant difference in statistics between the two groups. Meanwhile, this also indicates that implementing the SDBL model in intangible cultural heritage (ICH) music course teaching significantly improved achievement and EI of students.

DISCUSSION

RQ1: What are the Components of the SDBL Model for ICH Music Education?

The Self-Directed Learning (SDL) model enhances learners' autonomy to manage themselves, set meaningful goals, and improve overall learning efficiency by giving them greater control over their own learning process (Yurdal & Toraman, 2023; Hematian et al., 2016). The Blended Learning (BL) model brings the strengths of both online and offline instruction, offering learners flexibility and access to a wide range of learning resources as well as reinforcing outcomes through face-to-face interaction. (Darmah et al., 2023). Based on the literature review, this study integrated the most frequently appearing steps from various models to develop a self-directed blended learning (SDBL) approach. This model not only enables learners to flexibly manage their study time and learning tasks based on individual needs (Dahal & Bhat, 2023), but also integrates ICH-related videos, audio and textual resources provided through online platforms (Bai et al., 2024) and combined with group discussions and presentation activities. Furthermore, it enhances students' self-management, teacher-student interaction, and peer collaboration skills (Bruijn-Smolters & Prinsen, 2024).

In this study, the SDBL (Self-Directed Blended Learning) model applied to intangible cultural heritage (ICH) music education was built on two key components: self-directed learning and blended learning. In this study, the SDBL (Self-Directed Blended Learning) model in ICH music education emphasizes five progressive stages of self-directed learning: Setting Learning Targets, Making Plans, Gathering Information, Engaging in Online and Offline Learning Activities, Conducting Post-Lesson Reflections (Wasserman et al., 2024; Fink, 2003). The adoption of these five steps is consistent with Kathy's (Kathy, 2024) research, which similarly found that students were able to flexibly manage their learning pace, adjust their learning methods through feedback, and develop lifelong learning habits and skills, enabling them to adapt to the rapidly changing demands of society and the workplace (Morris, 2019).

In the "learning activity" phase of self-directed learning, a blended teaching model of online and offline is integrated, creating a dynamic learning environment (Dakhi et al., 2020). Students can easily access music resources and engage in interactive listening tasks guided by online materials, enhancing their ability to collaborate and share with others (Johler, 2022). After the reflection phase, the teaching returns to the initial goal stage, creating a complete feedback loop and driving continuous improvement in learning (Taylor et al., 2023; Saks & Leijen, 2014).

In the context of ICH music education, the modular design of the SDBL model focuses on one ICH project each week. By integrating the five steps of self-directed learning with a blend of online and face-to-face interactions, this approach boosts students' engagement and improves learning outcomes (R. Crawford, 2017). Vijayabanu & Menon (Vijayabanu & Menon, 2016)'s research shows that the implementation of music courses contributes to the development of emotional intelligence. Thus, the integration of SDL and BL into the SDBL model not only provides an innovative approach to ICH music education but also demonstrates significant advantages in fostering students' cognitive and emotional development.

RQ2: How does this SDBL Model Affect the EI and Achievement?

The Role of SDBL in Enhancing Achievement through ICH Music

The data from this teaching experiment revealed that students in the experimental group, who engaged in the SDBL model, exhibited significantly higher post-test scores compared to those in the control group using traditional teaching methods. These findings are consistent with the meta-analyses by Bernard et al. (Bernard et al., 2014) and Graham (2019), which highlighted the enhanced learning outcomes associated with blended approaches due to their flexibility and engagement with diverse learning resources. Specifically, the use of multimedia resources and interactive platforms in SDBL provides opportunities for deeper cognitive engagement.

The Role of SDBL in Enhancing EI through ICH Music

During the study, students went through several learning steps: setting personal goals, exploring music and culture, joining group talks, giving class presentations, and doing reflections. These connected activities helped them gradually learn to recognize, understand, express, and control their feelings. The emotional experiences from ICH music appreciation helped students become more aware of their emotions and express them better. Group work and peer feedback strengthened emotional connections between students, improving their social skills and ability to manage emotions.

Research shows that blended learning helps students engage emotionally and interact more with others (Banes et al., 2024). Music education itself also boosts students' emotional awareness and mental resilience (Wang et al., 2022). The SDBL teaching model focuses on letting students learn at their own pace and use different types of learning materials. This helps students connect more deeply with both the cultural and emotional parts of their learning. This method matches well with the social-emotional learning approach developed by Durlak and others (Durlak et al., 2011b). Traditional music, as part of cultural heritage, plays a special role in helping students understand others' feelings and feel stronger connections to their culture (Varella, 2023; Ning, 2023). Because of this, the SDBL model doesn't just help students do better in school - it also helps them develop emotional intelligence.

The study found that students in the experimental group showed significant improvement not only in academic performance but also in emotional intelligence. More importantly, those with higher emotional intelligence tended to achieve better academic outcomes. This finding is consistent with the analysis by Sanchez Alvarez et al. (Sanchez-Alvarez et al., 2020) which, based on data from 19861 participants, significant correlation between emotional intelligence and academic achievement. Introducing emotional intelligence courses in schools can support students' overall development while also contributing to improved academic performance (Quilez-Robres et al., 2023).

This study only included Chinese domestic university students. Therefore, it's not clear if the results apply to international students or those from different cultural backgrounds. Cultural background might affect how students take part in ICH music courses and how much they benefit from them. This means more cross-cultural studies are needed to check the results again. Also, this study didn't look at factors like age and social background (rural vs. urban). But these factors might have an influence. For example, students from rural areas may have more contact with traditional music. Older students may have better skills in controlling their emotions. What's more, music and cultural courses are not the only ways to develop emotional intelligence (EI). Other methods have also been shown to work, such as drama-based teaching (Yildirim, 2022), playing sports (Urska & Denise L, 2017), and social-emotional learning (Green et al., 2022). Future research could explore how these different methods—used alone or together—help improve EI and academic performance.

CONCLUSION

The music course on intangible cultural heritage (ICH) helped students do better in school and improved their emotional skills. The experimental group scored 8.04 points higher than the control group, showing that this method works well. The data also showed that students with better emotional skills did better in their studies, meaning emotional intelligence helps them handle school challenges and improve their grades.

The experiment showed that the SDBL model works best when students guide their own learning, when classes combine online and offline teaching model, and diverse resources.

In this study, the participants shared a relatively homogeneous cultural background, as all were domestic university students in China. This cultural homogeneity may have influenced how students engaged with and benefited from the ICH music course. The results should therefore be applied carefully to other cultural contexts. Future research should include participants from diverse backgrounds to better understand these differences.

Talking about their thoughts and expressing feelings through music helped students even more than we expected, proving this method is a good new way to support both their learning and emotional growth. The teachers' preparation was very important. They tested online tools and prepared good learning materials, which helped make classes more interesting. The study was conducted at a university using Chaoxing Erya,

its online learning platform. This system supported both classroom and online learning. Teachers used it to share course materials, provide extra resources, conduct discussions, collect assignments, and track student progress. These digital tools helped maintain consistent learning and supported the blended learning method used in the study.

The SDBL method worked well because it let students learn on their own, work together, and be flexible in how they learn. This made students more willing to join in and more excited about learning.

The results show that mixing music and cultural lessons with both online and classroom learning can help students grow emotionally and intellectually. Future studies should test this method in different school settings to make it work even better, E.g. for distance and online learning. This research helps create new teaching methods that combine cultural traditions with independent and group learning.

The results show that integrating music and cultural lessons through both online and classroom learning can effectively foster students' emotional and intellectual growth. Future studies should test this method in varied educational contexts, including fully distance or online learning environments, to explore how digital platforms can further enhance accessibility, engagement, and learning outcomes.

LIMITATIONS AND FUTURE DIRECTIONS

Although the findings of this study are convincing, some limitations should be noted. First, the program was relatively short, which may limit how well the results apply to long-term education and pedagogical effects. Future studies could extend the research period to see if the SDBL approach continues to benefit students' academic performance and emotional growth. Second, this study mainly used numerical data to measure learning outcomes and emotional intelligence. Adding interviews or group discussions could help better understand students' experiences and explain why these improvements happened.

Future research should include a control group using only online learning. This would better compare three teaching methods: blended learning, traditional classroom teaching, and fully online courses. The study could show if online music and culture courses work as well for improving students' emotional intelligence and grades. These findings would help improve how technology is used in cultural education.

Finally, this study was conducted in a controlled experimental setting, which might not show how it would work in real classrooms. Future research should test the SDBL method in different learning environments - like rural schools or under-resourced communities - to see if it works well in more places.

BIODATA AND CONTACT ADDRESSES OF AUTHORS



Fang LIU is a Ph.D. candidate in Innovation and Research for Learning at the School of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok, Thailand. She also serves as a lecturer in music education at Taiyuan University of Science and Technology, Shanxi, China. Her research interests include self-directed learning, blended learning, emotional intelligence, and the integration of intangible cultural heritage (ICH) music into higher education. Her work focuses on the development of innovative pedagogical models to enhance students' academic achievement and emotional competencies. She has published academic articles

in international peer-reviewed journals and continues to explore the application of educational technology and artificial intelligence in music education and cultural heritage learning.

Fang LIU

School of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang

Address: King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok 10520, Thailand

Phone: +86 15003469118

Email: 63603158@kmitl.ac.th



Dr. Kanyarat SRIWISATHIYAKUN is an Associate Professor in the School of Industrial Education and Technology at the King Mongkut's Institute of Technology Ladkrabang in Bangkok, Thailand. She enhances educational practice by applying innovation and digital technologies to support effective teaching and learning. Her research focuses on academic innovation, with particular attention to developing inclusive learning approaches for vulnerable and specialized learner groups. She has extensive experience in designing technology-enhanced learning environments that integrate immersive technologies, gamification, and artificial intelligence to foster student engagement and higher-order thinking skills. She is also actively involved in international research collaborations, publishes in leading academic journals, supervises graduate students, and contributes to the development of innovative curricula aligned with global education standards.

Kanyarat SRIWISATHIYAKUN

School of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang

Address: King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok 10520, Thailand

Phone: +66 845516654

Email: kanyarat.sr@kmitl.ac.th



Dr. Sirirat PETSANGSRI holds a Doctor of Education in instructional design and technology from the School of Education at the University of Pittsburgh, USA. Currently, she is a lecturer at the Industrial Education Department, School of Industrial Education and Technology, King Mongkut's Institute of Technology, Ladkrabang, Thailand. She has more than 30 journal articles published in international indexes and focuses on educational technology, technology-enhanced learning, motivation, cognitive load theory, blended learning environments, and the flipped classroom.

Sirirat PETSANGSRI

School of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang

Address: King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok 10520, Thailand

Phone: +66 899222302

Email: sirirat.pe@kmitl.ac.th

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