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Developing a Self-Management Model of a Professional Piano Training Program for Music Students in Hubei, China

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Abstract

Background and Aim: In China's education system, piano proficiency is essential for effective music instruction, yet many primary school music teachers lack adequate piano skills. This study aimed to develop, implement, and evaluate a self-management model for a professional piano training program for music students in Hubei, China, addressing the gap between classical performance training and practical classroom needs by enhancing students' piano skills, teaching competencies, and self-regulated learning abilities.

Materials and Methods: This sequential explanatory mixed-methods study was conducted in three phases: (1) needs assessment through questionnaires from 246 students and 53 teachers/administrators; (2) model development through focus group discussions with 10 experienced music educators; and (3) implementation and evaluation through a10 units training program with 30 randomly selected music students. Pre-test and post-test assessments and satisfaction surveys were used to evaluate effectiveness.

Results: The needs assessment revealed significant gaps between current training practices and expectations, with all self-management dimensions rated "Low" in current implementation but "High" in expectations. The implemented model, organized into 10 units, significantly improved students' piano skills, with test scores increasing from an average of 9.47 to 28.03 ($p<0.01$). Student satisfaction was exceptionally high (4.88/5.0), particularly regarding improved improvisation abilities and teaching readiness.

Conclusion: The self-management model effectively enhanced piano proficiency and teaching competencies by integrating goal setting, self-monitoring, self-evaluation, and self-reinforcement strategies. This approach bridges the gap between traditional training and practical classroom needs, preparing more capable music educators. Future research should explore the model's long-term impact on career development, applications in diverse educational settings, and integration with educational technology to further enhance music teacher preparation in China.

Keywords: Self-management; Piano training; Music education; Teacher preparation; Professional development

Introduction

Music education is vital in fostering artistic literacy and emotional expression among students. According to the Compulsory Education Music Curriculum Standard (Yu & Leung, 2019), instrumental instruction, particularly piano education, significantly enhances students' interest in music, comprehension of musical concepts, and ability to create and perform. As China's education reforms continue to emphasize the development of comprehensive music programs, the integration of piano training into primary school music education has gained increasing attention.

The piano, often called the "King of Instruments," holds a unique position in music education due to its harmonic capabilities, versatility, and accessibility. In primary school classrooms, piano accompaniment enhances singing lessons, supports theoretical instruction, and enriches students' overall musical experience. However, a critical challenge in China's primary music education system is the insufficient piano proficiency among primary school music teachers. Many teachers cannot play the piano proficiently, leading to a heavy reliance on pre-recorded audio tracks and multimedia-based instruction. This, in turn, reduces the engagement, spontaneity, and creativity in music lessons, making them less interactive and enjoyable for students (Jones, 2009).

To address this gap, colleges and universities must establish structured and comprehensive piano training programs for future primary school music teachers. The accreditation of teacher training programs in ordinary colleges and universities underscores the necessity of student-centered, competency-based, and

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outcome-oriented training. Institutions must align their curricula with the evolving needs of the education sector, ensuring that teacher training programs incorporate not only technical skills but also pedagogical strategies that enhance student engagement.

Hubei Engineering University, located in Xiaogan, Hubei Province, is a higher education institution committed to producing skilled educators, including music teachers for primary and secondary schools (Hubei Engineering University Official Website, 2023). The School of Music offers a comprehensive curriculum, including piano courses, vocal training, music history, harmony, and pedagogy. However, its traditional piano courses focus primarily on classical piano performance rather than the practical skills required for primary school music education, such as children's song accompaniment and improvisation.

To bridge this gap, this research aims to develop a self-management model for a professional piano training program tailored for future primary school music teachers in Hubei, China. This program seeks to enhance students' piano skills, improve their employability, and ensure they are well-equipped to meet the practical demands of primary school music education. By incorporating self-management strategies, this model encourages students to take an active role in their learning, fostering independence and long-term skill development.

Objectives

1. To investigate the needs assessment of students and educational administrators, and teachers towards a professional piano training program for music students.
2. To develop a self-management model of a professional piano training program for music students in Hubei, China.
3. To evaluate the effectiveness of the self-management model of a professional piano training program for music students in Hubei, China.
4. To study student satisfaction with a professional piano training program.

Literature Review

Concept of Self-Management

Self-management is a fundamental concept in psychology and education, referring to an individual's ability to regulate, monitor, and adapt their behavior, learning strategies, and actions to achieve specific goals (Bandura, 1986). It is a critical skill for lifelong learning, academic success, and professional development (Zimmerman, 1990). In the context of music education, self-management fosters structured practice habits, technical mastery, and long-term skill retention. Unlike traditional learning models that rely heavily on teacher-led instruction, self-managed learning empowers students to take control of their practice schedules, assessment methods, and skill development strategies (Kanfer & Gaelick-Buys, 1991).

Self-Management in Education

Self-management is widely regarded as an essential factor in academic success, time management, and self-directed learning. Studies indicate that students who employ structured self-management strategies demonstrate higher motivation, better performance, and greater resilience in learning (Kung & Lin, 2021). A widely recognized four-stage self-management framework was introduced by Kanfer and Gaelick-Buys (1991):

1. Goal Setting: Defining clear, specific, and measurable learning objectives.
2. Self-Monitoring: Keeping a structured record of learning progress, strengths, and areas for improvement.
3. Self-Evaluation: Using assessment rubrics, peer reviews, and teacher feedback to measure skill development.
4. Self-Reinforcement: Engaging in structured motivational techniques, such as self-reward systems, progressive challenges, and reflective exercises to sustain learning.

According to Jones (2009), these self-management strategies enhance learner engagement, autonomy, and academic achievement. His MUSIC model of motivation emphasizes five key elements:

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empowerment, usefulness, success, interest, and caring that contribute to long-term learning engagement and student perseverance.

Self-Management Models in Music Training

In music education, self-management has been increasingly integrated into training programs to improve student motivation, technical proficiency, and artistic expression. Kung & Lin (2021) highlight that self-management strategies foster resilience, adaptability, and deeper cognitive engagement in music students. Their neural network-based self-management model demonstrates that structured self-regulation techniques significantly enhance learning efficiency, practice effectiveness, and self-discipline.

These findings suggest that integrating self-management models into professional piano training can improve both performance and teaching competencies, preparing future educators for primary school music instruction.

Professional Piano Training in China

Importance of Piano Training in Music Education

The Compulsory Education Music Curriculum Standard (Yu & Leung, 2019) highlights the essential role of instrumental training in enhancing creativity, musical expression, and technical proficiency. Among all instruments, the piano holds unique significance due to its harmonic range and versatility, making it a valuable tool for song accompaniment, solo performance, and theoretical instruction. In primary school music education, piano accompaniment enhances student engagement, improves vocal performance, and supports music literacy development.

However, a significant issue in China's music education system is the lack of piano proficiency among music teachers. Liu (2020) found that many elementary school music teachers struggle with basic piano skills, leading to a heavy reliance on pre-recorded audio tracks instead of live accompaniment. This reduces the interactive and expressive quality of music lessons, making them less engaging and effective.

Challenges in Piano Teacher Training

Current piano teacher training programs in China focus primarily on classical piano performance, often neglecting practical teaching applications such as children's song accompaniment and improvisation. This gap between traditional training methods and real-world classroom needs has been widely documented (Yu & Leung, 2019). Additionally, a lack of structured self-management in piano training leads to inefficient practice habits, poor time management, and inconsistent skill retention (Kung & Lin, 2021).

Developing a Self-Management Model for Piano Training

Theoretical Foundations of the Self-Management Model

The self-management model proposed in this study is based on:

1. Kanfer & Gaelick-Buys (1991): A four-stage framework emphasizing goal setting, monitoring, evaluation, and reinforcement.

2. Jones (2009): The MUSIC model of motivation, which identifies key factors influencing engagement and persistence.

3. Kung & Lin (2021): Applied self-management strategies that integrate technology-enhanced learning and self-regulated practice methods.

Components of the Self-Management Model for Piano Training

The proposed model consists of four interconnected elements:

1. Goal Setting: Establishing clear, measurable objectives aligned with curriculum requirements.

2. Self-Monitoring: Students track their progress through practice logs, video recordings, and structured peer feedback.

3. Self-Evaluation: Engaging in self-assessment exercises, teacher evaluations, and performance reflection.

4. Self-Reinforcement: Encouraging students to maintain motivation through structured training routines, progressive skill challenges, and public performance opportunities.

Expected Benefits of the Self-Management Model

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- Enhanced Learning Autonomy: Students develop stronger self-regulation skills, leading to more independent and effective practice (Kung & Lin, 2021).
- Improved Teaching Competency: Future music educators acquire practical piano skills, ensuring their readiness for primary school music instruction (Liu, 2020).
- Greater Student Engagement: Integrating self-management and motivation techniques leads to higher levels of engagement and retention (Jones, 2009).

Summary of Literature Review

The reviewed literature highlights several critical challenges in piano teacher training, particularly:

1. The lack of structured self-regulated learning approaches in current programs.
2. The limited focus on pedagogical applications, with a primary emphasis on classical piano repertoire over practical teaching techniques.

By integrating self-management strategies into piano training programs, this study aims to develop a competency-based training model that aligns with the evolving needs of primary school music teachers in Hubei, China.

Conceptual Framework

The conceptual framework of this research is built upon several interconnected theoretical foundations and practical considerations aimed at addressing the gap in piano training for future primary school music teachers in Hubei, China.

Theoretical Foundations

The framework is primarily anchored in self-management theory as conceptualized by Zimmerman (1990), who established that self-management is a critical skill for lifelong learning and professional development. This is particularly relevant in music education, where structured practice habits and technical mastery are essential (Kanfer & Gaelick-Buys, 1991).

The four-stage self-management framework proposed by Kanfer and Gaelick-Buys (1991) forms the core of this study's conceptual model:

1. **Goal Setting**: Defining clear, specific, and measurable learning objectives aligned with curriculum requirements.
2. **Self-Monitoring**: Systematic tracking of learning progress through structured methods such as practice logs and video recordings.
3. **Self-Evaluation**: Using assessment rubrics, peer reviews, and teacher feedback to measure skill development.
4. **Self-Reinforcement**: Implementing motivational techniques to sustain learning engagement and progress.

This framework is complemented by Jones' (2009) MUSIC model of motivation, which emphasizes five key elements that contribute to student engagement: empowerment, usefulness, success, interest, and caring. These elements are integrated into the self-management model to enhance student motivation and perseverance.

Practical Considerations

The Compulsory Education Music Curriculum Standard (Yu & Leung, 2019) highlights the essential role of instrumental training in enhancing creativity and musical expression. The piano holds unique significance in music education due to its harmonic capabilities and versatility, making it an invaluable tool for classroom instruction.

However, as Liu (2020) noted, many elementary school music teachers in China struggle with basic piano skills, leading to a heavy reliance on pre-recorded audio tracks instead of live accompaniment. This reduces the interactive quality of music lessons, making them less engaging for students.

Components of the Framework

The conceptual framework illustrates the relationship between:

- The identified needs of students toward professional piano training

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- The four components of the self-management model (goal setting, self-monitoring, self-evaluation, and self-reinforcement)
- The concepts of a professional piano training program design
- The expected outcomes: effectiveness and student satisfaction

The integration of self-management strategies, as proposed by Kung & Lin (2021), aims to foster resilience, adaptability, and deeper cognitive engagement in music students. Their research demonstrates that structured self-regulation techniques significantly enhance learning efficiency and practice effectiveness, as shown in Figure 1.

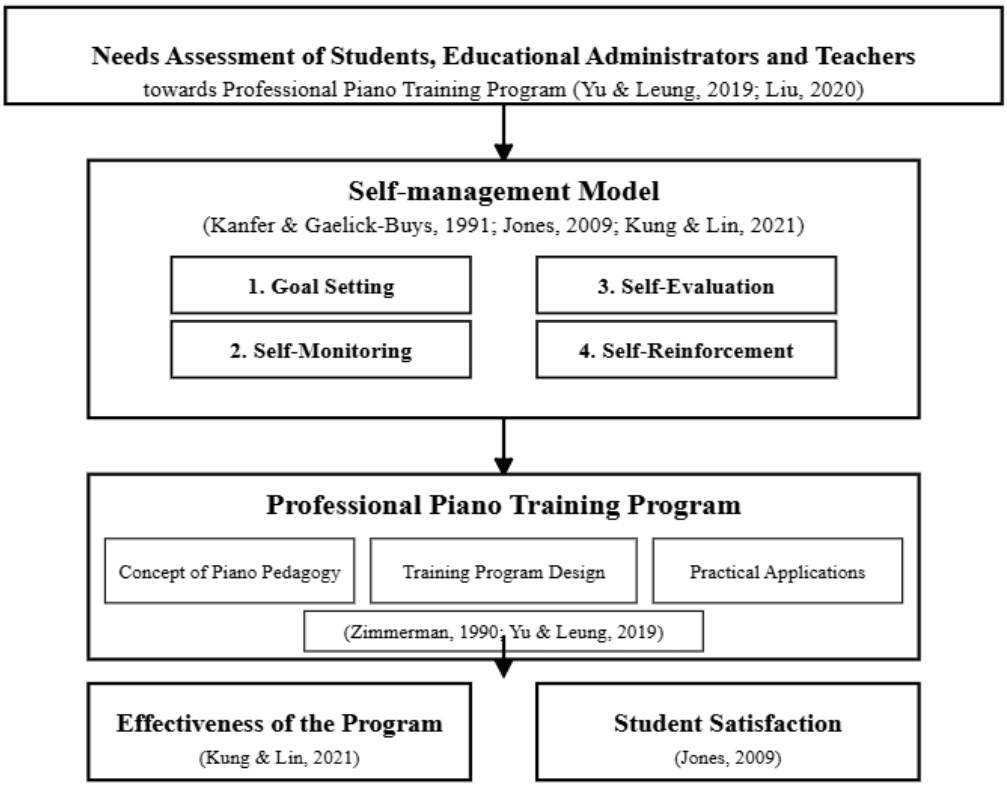

Figure 1: Conceptual Framework

Explanation of the Conceptual Framework

The diagram illustrates the flow and interrelationships between the key components of this research:

1. Needs Assessment

At the top of the framework, the needs assessment of students, educational administrators, and teachers forms the foundation of the study. This assessment is crucial for understanding the current gaps in piano training programs and is supported by the findings of Yu & Leung (2019) and Liu (2020), who identified significant deficiencies in piano proficiency among primary school music teachers in China.

2. Self-Management Model

The core of the framework is the self-management model, which integrates theories from Kanfer & Gaelick-Buys (1991), Jones (2009), and Kung & Lin (2021). The model consists of four key components:

Goal Setting: Establishing clear, measurable objectives aligned with curriculum requirements.

Self-Monitoring: Systematic tracking of learning progress

Self-Evaluation: Using assessment tools to measure skill development

Self-Reinforcement: Implementing motivational techniques to sustain learning.

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3. Professional Piano Training Program

The self-management model informs the development of a professional piano training program that incorporates:

- Concepts of piano pedagogy appropriate for primary school music education
- Training program design principles based on Zimmerman's (1990) self-regulated learning theory.
- Practical applications that address the real needs of classroom music instruction as identified by Yu & Leung (2019)

4. Outcomes

The framework culminates in two anticipated outcomes:

Effectiveness of the Program: Measured by improvements in piano proficiency and teaching competency, as supported by Kung & Lin's (2021) findings on self-regulation and learning efficiency.

Student Satisfaction: Evaluated based on Jones's (2009) MUSIC model of motivation, which emphasizes empowerment, usefulness, success, interest, and caring.

This conceptual framework provides a structured approach to addressing the gap between traditional piano training methods in China and the practical needs of primary school music education. By integrating self-management strategies with competency-based training, the model aims to enhance both the piano skills and pedagogical abilities of future music teachers, ultimately improving the quality of music education in primary schools across Hubei, China.

Methodology

This chapter outlines the research methodology employed to achieve the objectives of this study, which aims to develop and evaluate a self-management model for a professional piano training program for music students in Hubei, China. The methodology is divided into three phases, each corresponding to the research objectives. The study adopts a mixed-methods approach, combining quantitative and qualitative data collection and analysis techniques to ensure comprehensive and reliable results.

Research Design

This study employs a sequential explanatory mixed-methods design (Creswell & Creswell, 2022), which involves collecting and analyzing quantitative data first, followed by qualitative data to explain and elaborate on the quantitative findings. The research is organized into three phases:

1. Phase 1: Needs assessment through a questionnaire survey.
2. Phase 2: Development of the self-management model through a focus group discussion.
3. Phase 3: Implementation and evaluation of the training program.

Population and Sample

Population

- Phase 1: The population includes 640 music students, 43 teachers, and 10 school administrators from the School of Music at Hubei Engineering University (Hubei Engineering University Official Website, 2023).
- Phase 2: The population for the focus group discussion consists of 10 experienced music educators with expertise in piano training and pedagogy.
- Phase 3: The population for the training program includes 30 randomly selected music students from the School of Music.

Sample

- Phase 1: A sample of 246 students and 53 teachers, and administrators was selected using the Yamane (1973) formula for sample size calculation. The sample ensures a 95% confidence level and a 5% margin of error.
- Phase 2: A purposive sample of 10 music educators with extensive experience in piano training was selected for the focus group discussion.
- Phase 3: A random sample of 30 students was selected for the training program to ensure representativeness and generalizability.

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Research Instruments

Phase 1: Questionnaire Survey

- A structured questionnaire was developed to assess the needs and expectations of students, teachers, and administrators regarding a professional piano training program. The questionnaire consists of two parts:

1. Part 1: Demographic information (e.g., age, gender, year of study, teaching experience).
2. Part 2: A 30-item Likert scale (1 = strongly disagree to 5 = strongly agree) assessing the current status and expectations for a piano training program. (Likert, 1932)

- The questionnaire was validated by five experts using the Index of Item Objective Congruence (IOC), with scores ranging from 0.66 to 1.00, indicating high content validity (Polit & Beck, 2023).

- The reliability of the questionnaire was tested using Cronbach's alpha, yielding a coefficient of 0.97 for both student and teacher questionnaires, indicating excellent internal consistency (Cronbach, 1951).

Phase 2: Focus Group Discussion

- A semi-structured interview guide was developed to facilitate the focus group discussion. The guide includes open-ended questions designed to explore how the self-management model can be applied to a professional piano training program.

- The questions were validated by five experts using the IOC, ensuring alignment with the research objectives.

- The focus group discussion was conducted over four hours, and the data were recorded and transcribed for analysis.

Phase 3: Training Program Evaluation

- A pre-test and post-test design was used to evaluate the effectiveness of the training program. The tests consisted of 30 multiple-choice and quiz questions assessing students' knowledge and skills in piano playing, accompaniment, and teaching techniques.

- The tests were validated by five experts using the IOC, ensuring content validity.

- A student satisfaction survey was also administered after the training program to assess participants' satisfaction with the program. The survey used a 5-point Likert scale and was validated using the IOC. (Likert, 1932)

Data Collection

Phase 1: Questionnaire Survey

- The questionnaire was distributed online using Questionnaire Star, a widely used platform for data collection in China. Participants were informed of the purpose of the study and provided consent before completing the questionnaire.

- A total of 640 student questionnaires, 43 teacher questionnaires, and 10 administrator questionnaires were distributed. At least 246 valid student responses and 53 valid teacher/administrator responses were collected.

Phase 2: Focus Group Discussion

- The focus group discussion was conducted in person at Hubei Engineering University. The discussion was moderated by the researcher, and participants were encouraged to share their insights and experiences.

- The discussion was audio-recorded and transcribed verbatim for analysis.

Phase 3: Training Program Evaluation

- The training program was conducted over 10 units; The ten units will take a total of 60 hours to complete. Each module has 6 elements of 1 hour each, and each module takes 6 hours to complete. The entire course training is completed in 10 days, 6 hours per day, with unit sessions focusing on piano skills, teaching techniques, and self-management strategies.

- Pre-tests were administered before the training program, and post-tests were administered immediately after the program. The student satisfaction survey was administered one week after the program.

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Data Analysis

Phase 1: Questionnaire Survey

- Quantitative data from the questionnaire were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) to summarize the respondents' needs and expectations.

Phase 2: Focus Group Discussion

- Qualitative data from the focus group discussion were analyzed using thematic analysis (Braun & Clarke, 2023). The transcripts were coded, and themes were identified based on the research objectives.
- The findings were used to refine the self-management model and training program.

Phase 3: Training Program Evaluation

- The effectiveness of the training program was evaluated by comparing pre-test and post-test scores using a paired t-test to determine if there was a significant improvement in students' knowledge and skills.
- Student satisfaction was analyzed using descriptive statistics (mean and standard deviation).

Ethical Considerations

- Ethical approval was obtained from the Institutional Review Board (IRB)
- Informed consent was obtained from all participants before data collection.
- Confidentiality and anonymity were maintained throughout the study.

Summary of Methodology

This study employs a mixed-methods approach to develop and evaluate a self-management model for a professional piano training program. The methodology is designed to address the research objectives systematically, ensuring the validity and reliability of the findings. The integration of quantitative and qualitative data provides a comprehensive understanding of the needs, effectiveness, and satisfaction of the training program.

Results

Objective 1. To investigate the needs assessment of students and educational administrators, and teachers towards a professional piano training program for music students.

Table 1 General Information of Students (n=246)

Category	Details	Frequency	Percentage
Gender	Male	58	23.58%
	Female	188	76.42%
Age	17-18 years	27	10.98%
	19-20 years	133	54.07%
	21-22 years	82	33.33%
	22+ years	4	1.62%
Total		246	100.00%

According to Table 1, the demographic profile of the study participants (n=246) reveals a predominantly female sample, with women constituting 76.42% (188 students) compared to men at 23.58% (58 students). The age distribution shows that most participants were between 19-20 years old (54.07% or 133 students), followed by those aged 21-22 years (33.33% or 82 students). A smaller portion of the sample included younger students aged 17-18 years (10.98% or 27 students), while students older than 22 years represented only a minimal fraction (1.62% or 4 students). This demographic composition suggests that the research primarily captured data from undergraduate students in their middle years of study, with a significant gender imbalance that favors female participation in the music education program at Hubei, China.

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Table 2 General Information of Teachers and Educational Administrators (n=53)

Category	Details	Frequency	Percentage
Gender	Male	19	35.85%
	Female	34	64.15%
Age	20-30 years	6	11.32%
	31-35 years	9	16.98%
	36-40 years	8	15.09%
	41-45 years	17	32.08%
	45+ years	13	24.53%
Education Level	Bachelor's Degree	7	13.21%
	Master's Degree	37	69.81%
	Doctoral Degree	9	16.98%
Years of Service	1-10 years	15	28.30%
	11-20 years	21	39.62%
	21-30 years	12	22.64%
	31-40 years	5	9.43%
Total		53	100.00%

According to Table 2, the demographic characteristics of the teachers and educational administrators (n=53) reveal several notable patterns. The sample consists predominantly of female educators (64.15%) compared to male educators (35.85%), though this gender disparity is less pronounced than observed in the student population. Age distribution shows that most educational professionals are in their middle to late career stages, with the largest concentration in the 41-45 years bracket (32.08%) and those over 45 years (24.53%), collectively representing over half of the sample (56.61%).

The educational qualifications of these professionals are notably high, with 86.79% holding postgraduate degrees, 69.81% with master's degrees, and 16.98% with doctoral degrees. Only a small percentage (13.21%) have bachelor's degrees as their highest qualification. In terms of professional experience, the largest group has served between 11-20 years (39.62%), followed by those with 1-10 years of experience (28.30%) and those with 21-30 years of service (22.64%). A smaller percentage (9.43%) has extensive experience of 31-40 years.

This demographic profile indicates that the educational practitioners involved in this study are primarily experienced, well-qualified professionals, suggesting they possess substantial expertise in music education and academic administration that can provide valuable insights into piano training program development and implementation in Hubei, China.

Table 3 Needs Assessment from the Student Perspective

Dimension	Mean (Current Status)	S.D.	Level	Mean (Expectations)	S.D.	Level
Goal Setting	2.39	0.76	Low	3.97	0.61	High
Self-Monitoring	2.35	0.71	Low	3.95	0.64	High
Self-Evaluation	2.36	0.71	Low	3.95	0.62	High
Self-Reinforcement	2.39	0.73	Low	3.98	0.60	High
Overall Average	2.36	0.72	Low	3.96	0.61	High

According to Table 3, there is a substantial disparity between students' perceptions of the current status of self-management elements in their piano training program and their expectations for these elements. The data reveal that students rate all four dimensions of self-management, Goal Setting, Self-

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Monitoring, Self-Evaluation, and Self-Reinforcement, as "Low" in their current implementation, with mean scores ranging from 2.35 to 2.39 on the rating scale. The overall average for current status is 2.36 (S.D. = 0.72), indicating a consistently low evaluation across these dimensions.

In stark contrast, students express high expectations for all four self-management dimensions, with mean scores ranging from 3.95 to 3.98. The overall average expectation score is 3.96 (S.D. = 0.61), categorized as "High" level. This represents a gap of approximately 1.6 points between current status and expectations across all dimensions.

The consistency in both the low ratings of current status and high expectations across all four self-management components suggests that students recognize significant room for improvement in how self-management strategies are integrated into their piano training program. The relatively uniform standard deviations across all measurements indicate consensus among students regarding these assessments. This pronounced gap highlights the need for a comprehensive redesign of the piano training program to incorporate robust self-management strategies that align with student expectations, supporting the rationale for developing the proposed self-management model for professional piano training at Hubei Engineering University.

Table 4 Needs Assessment from Teachers and Administrators' Perspective

Dimension	Mean (Current Status)	S.D.	Level	Mean (Expectations)	S.D.	Level
Goal Setting	4.19	0.62	High	4.77	0.48	Highest
Self-Monitoring	2.26	0.85	Low	4.16	0.60	High
Self-Evaluation	2.23	0.76	Low	4.11	0.57	High
Self-Reinforcement	2.19	0.64	Low	4.08	0.56	High
Overall Average	2.61	0.73	Low	4.25	0.56	High

According to Table 4, the needs assessment from teachers and administrators reveals a more nuanced perspective on the self-management dimensions compared to the student assessment. The most striking finding is the distinct evaluation of Goal Setting compared to the other three dimensions.

Teachers and administrators rate the current status of Goal Setting as "High" (Mean = 4.19, S.D. = 0.62), significantly higher than their ratings for Self-Monitoring (Mean = 2.26, S.D. = 0.85), Self-Evaluation (Mean = 2.23, S.D. = 0.76), and Self-Reinforcement (Mean = 2.19, S.D. = 0.64), all of which are rated as "Low." This indicates that while educators believe goal-setting practices are already well-established in the current piano training program, they recognize significant deficiencies in the other three aspects of self-management.

For expectations, teachers and administrators rate Goal Setting at the "Highest" level (Mean = 4.77, S.D. = 0.48), while rating the other three dimensions as "High" with means ranging from 4.08 to 4.16. The overall average expectation is "High" (Mean = 4.25, S.D. = 0.56), demonstrating educators' strong belief in the importance of comprehensive self-management strategies.

The gap between current status and expectations varies considerably across dimensions. For Goal Setting, the gap is relatively small (0.58), suggesting educators believe some improvement is needed, but the foundation is already strong. For the other three dimensions, the gaps are much larger (approximately 1.90 points), indicating areas that require substantial development.

This assessment from educational professionals highlights the uneven implementation of self-management strategies in the current program and provides critical insights for prioritizing improvements, particularly in the areas of Self-Monitoring, Self-Evaluation, and Self-Reinforcement, while building upon the existing strengths in Goal Setting.

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International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Objective 2. To develop a self-management model of a professional piano training program for music students in Hubei, China.

Table 5 Content of the Self-Management Model for Piano Training Program for Music Students

Units & Lessons	Content	IOC
Unit 1: "Two Tigers" and "Two Little Elephants"		
Lesson 1	Theoretical knowledge: Importance of the piano in elementary music teaching	1.00
Lesson 2	Basic piano playing: Monophonic, diatonic, and chordal approaches	1.00
Lesson 3	Piano accompaniment for "Two Tigers"	1.00
Lesson 4	Study of "Two Little Elephants" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	0.80
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 2: "Duckling" and "Two Tigers"		
Lesson 1	Theoretical knowledge: Piano in elementary school clubs	1.00
Lesson 2	Basic piano playing: Alternate hand connections, skipping exercises	1.00
Lesson 3	Piano accompaniment for "Duckling"	1.00
Lesson 4	Study of "Two Tigers" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 3: "Climbing Tune" and "Good New Year"		
Lesson 1	Theoretical knowledge: Basic skills for elementary music teachers	1.00
Lesson 2	Basic Piano Playing Exercises: Drop and Roll, Legato Playing Methods	1.00
Lesson 3	Piano accompaniment for "Climbing Tune"	1.00
Lesson 4	Study of "Good New Year" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 4: "Under the Fence" and "Happy Birthday"		
Lesson 1	Theoretical knowledge: Basic qualities for elementary music teachers	1.00
Lesson 2	Basic piano playing: Layers and diatonic methods	1.00
Lesson 3	Piano accompaniment for "Under the Fence"	1.00
Lesson 4	Study of "Happy Birthday" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 5: "The Newspaper Selling Song" and "Farewell"		
Lesson 1	Theoretical knowledge: Summary of music theory in elementary school	1.00
Lesson 2	Basic piano playing: Chords, broken chord playing methods	1.00
Lesson 3	Piano accompaniment for "The Newspaper Selling Song"	1.00
Lesson 4	Study of "Farewell" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00

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Units & Lessons	Content	IOC
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 6: "Ah, How Good It Is!" and "Communist Children's League Song"		
Lesson 1	Theoretical knowledge: Common music teaching methods in China	1.00
Lesson 2	Basic piano playing: Homophonic repetition, sustained legato, complex rhythms	1.00
Lesson 3	Piano accompaniment for "Ah, How Good It Is!"	1.00
Lesson 4	Study of "Communist Children's League Song" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 7: "Happy Dance" and "Wahaha"		
Lesson 1	Theoretical knowledge: How to make students love music lessons	1.00
Lesson 2	Basic piano playing: Polyphony, side strike playing methods	1.00
Lesson 3	Piano accompaniment for "Happy Dance"	1.00
Lesson 4	Study of "Wahaha" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 8: "Little Cuckoo" and "Auspicious Three Treasures"		
Lesson 1	Theoretical knowledge: Organization of an elementary music classroom	1.00
Lesson 2	Basic piano playing: How to play ornaments	1.00
Lesson 3	Piano accompaniment for "Little Cuckoo"	1.00
Lesson 4	Study of "Auspicious Three Treasures" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 9: "Jingle Bells" and "The Sun Rises on the Grassland"		
Lesson 1	Theoretical knowledge: Rhythm training in elementary music class	1.00
Lesson 2	Basic piano playing: Pedal method	1.00
Lesson 3	Piano accompaniment for "Jingle Bells"	1.00
Lesson 4	Study of "The Sun Rises on the Grassland" from the curriculum standard textbook	1.00
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00
Unit 10: "The Party is the Sun and I am the Flower" and "Friendship for a Long Time"		
Lesson 1	Theoretical knowledge: Role of games in elementary music teaching	1.00
Lesson 2	Basic piano playing: Scale methods	1.00
Lesson 3	Piano accompaniment for "The Party is the Sun and I am the Flower"	1.00
Lesson 4	Study of "Friendship for a Long Time" from the curriculum standard textbook	1.00

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Units & Lessons	Content	IOC
Lesson 5	Classroom exercises	1.00
Lesson 6	Stage performance evaluation and reinforcement training	1.00

Note: IOC refers to the Index of Item-Objective Congruence, showing content validity assessment from experts. All items received high consistency ratings (0.80-1.00), indicating strong alignment with program objectives.

Based on Table 5, the Self-management Model for Piano Training Program for Music Students demonstrates a well-structured curriculum organized into 10 progressive units. Each unit follows a consistent pedagogical structure of 6 lessons, combining theoretical knowledge, technical piano skills, practical application, and performance evaluation.

The program strategically pairs Chinese children's songs with pieces from the National Curriculum Standard textbooks, creating a balanced approach that develops both practical teaching skills and formal piano technique. The theoretical components cover essential topics for music educators, from the importance of the piano in elementary teaching to specific classroom management strategies.

What's particularly notable is the high Index of Item-Objective Congruence (IOC) scores, with 59 out of 60 components receiving perfect 1.00 ratings from expert evaluators. Only one component (classroom exercises in Unit 1) received a slightly lower score of 0.80, which still indicates strong alignment with program objectives.

The curriculum demonstrates a gradual progression in technical difficulty:

- Early units focus on fundamental techniques like monophonic playing and hand coordination.
- Middle units introduce more complex approaches like chord structures and legato.
- Later units advance to sophisticated techniques like ornaments, pedaling, and scale methods.

This systematic progression, combined with the consistent reinforcement through classroom exercises and performance evaluation in every unit, creates a comprehensive framework that addresses both theoretical knowledge and practical application, essential components for future primary school music teachers in China.

Objective 3. To evaluate the effectiveness of the self-management model of a professional piano training program for music students in Hubei, China.

Table 6 Pre-Test and Post-Test Student Performance (n=30)

Number	Name	Pre-Test Score	Post-Test Score
1	Ms. Li	10	27
2	Ms. Liu	10	26
3	Ms. Luo	9	25
...	...	...	...
30	Ms. Liu	10	29
Total		262	847
Average		9.4	28.2

Based on Table 6, the data demonstrate a substantial improvement in student performance after implementing the self-management model for piano training. The pre-test scores averaged 9.4 points while the post-test scores averaged 28.2 points, representing a remarkable increase of 18.8 points or approximately 200% improvement.

The total scores increased from 262 points in the pre-test to 847 points in the post-test across the 30 participants. This dramatic improvement suggests that the self-management model had a significant positive impact on students' piano skills and knowledge.

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Although individual student data is abbreviated in the table (showing only 3 specific students plus the final student), the consistent pattern of low pre-test scores (around 9-10 points) compared to much higher post-test scores (25-29 points) indicates that the improvement was consistent across participants.

This substantial difference between pre-test and post-test results provides strong evidence for the effectiveness of the self-management model in enhancing piano training outcomes for music students at Hubei Engineering University.

Table 7 Comparison of Pre-Test and Post-Test Data (n=30)

Test	Mean	S.D.	t-value	Degrees of Freedom	Sig.
Pre-Test	9.47	2.01	-51.89	29	0.000**
Post-Test	28.03	1.45			

**Note: ** $p < 0.01$

Table 7 presents a statistical comparison between the pre-test and post-test results for students who participated in the self-management model for the piano training program. The data reveals several important findings:

1. Mean scores increased dramatically from 9.47 in the pre-test to 28.03 in the post-test, representing an improvement of 18.56 points or approximately 196%.

2. The standard deviation decreased from 2.01 in the pre-test to 1.45 in the post-test, indicating that student performance not only improved but also became more consistent after the intervention.

3. The t-value of -51.89 with 29 degrees of freedom resulted in a significance level of 0.000 ($p < 0.01$), which is highly statistically significant.

This statistical analysis provides strong evidence that the self-management model for piano training had a substantial and statistically significant positive effect on student performance. The extremely low p-value (0.000) indicates that the improvement observed between pre-test and post-test scores is almost certainly due to the intervention rather than chance. The reduced standard deviation in the post-test further suggests that the training program helped standardize skill levels among participants, creating more consistent outcomes.

Objective 4. To study student satisfaction with a professional piano training program.

Table 8 General Information of Students in the Training Program

Category	Details	Frequency	Percentage
Gender	Male	6	20.00%
	Female	24	80.00%
Year of Study	Junior	9	30.00%
	Senior	21	70.00%
Age	21-22 years	24	80.00%
	22+ years	6	20.00%
Total		30	100.00%

Table 8 provides demographic information about the 30 students who participated in the piano training program. The data shows several key characteristics of this sample:

1. Gender distribution: The program participants were predominantly female (80.00% or 24 students), with males making up only 20.00% (6 students). This gender imbalance is consistent with the broader student population shown in Table 1, though slightly more pronounced in this specific training group.

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2. Year of study: Most participants were senior students (70.00% or 21 students), while junior students represented 30.00% (9 students). This suggests that the program primarily attracted students who were further along in their academic progression.

3. Age distribution: The majority of participants (80.00% or 24 students) were 21-22 years old, with only 20.00% (6 students) being older than 22 years. This age distribution aligns with the typical age range for junior and senior university students.

The demographic profile of this training program sample indicates that it primarily involved female senior students in their early twenties. This composition is important to consider when interpreting the effectiveness of the self-management model, as the results may be particularly applicable to this specific demographic within music education programs.

Table 9 Results of the Student Satisfaction Questionnaire

Item	Mean	S.D.	Rating
Contents	**4.85**	**0.34**	**Highest**
Q1. The content is very helpful for my future as an elementary music teacher	4.83	0.37	Highest
Q2. The content is well-suited to the professional learning of future elementary music teachers	4.87	0.34	Highest
Q3. The content of the training is varied and can effectively improve my ability in various aspects	4.80	0.40	Highest
Q4. The training is interesting and motivates students to learn	4.83	0.37	Highest
Q5. The stage performance aspect of the training content has improved my performance skills	4.93	0.25	Highest
Benefits Gained from the Training	4.92	0.25	Highest
Q6. The training and learning have improved my ability to use the piano to improvise accompaniment for children's songs	4.97	0.18	Highest
Q7. Through training and study, I can play the pieces in the new national curriculum standard elementary school music textbook on the piano	4.93	0.25	Highest
Q8. Through the training, I have been able to master the abilities and basic qualities that elementary school music teachers need to have	4.90	0.30	Highest
Q9. Through the training, I was able to master the basic practice methods and techniques of piano playing	4.97	0.18	Highest
Q10. The training has made me more confident when I have the opportunity to work as an elementary school music teacher in the future	4.87	0.34	Highest
Overall Average	4.88	0.29	Highest

Table 9 presents the results of the student satisfaction questionnaire regarding the self-management model for piano training. The data reveals exceptionally high levels of satisfaction across all measured dimensions.

The questionnaire was organized into two main categories: "Contents" and "Benefits Gained from the Training." The overall average satisfaction rating was 4.88 out of 5 (S.D. = 0.29), which falls into the "Highest" rating category.

For the "Contents" category (average mean = 4.85, S.D. = 0.34), all five questions received "Highest" ratings. The highest-rated item in this category was Q5 regarding stage performance aspects improving performance skills (mean = 4.93, S.D. = 0.25), while the lowest-rated (though still extremely high) was Q3 about the variety of training content (mean = 4.80, S.D. = 0.40).

The "Benefits Gained from the Training" category received an even higher average rating (mean = 4.92, S.D. = 0.25). Within this category, two items tied for the highest ratings: Q6 regarding improved

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ability to improvise piano accompaniment for children's songs and Q9 about mastering basic practice methods and techniques (both with mean = 4.97, S.D. = 0.18). The lowest rating in this category, still remarkably high, was Q10 about increased confidence for future work as elementary school music teachers (mean = 4.87, S.D. = 0.34).

The notably small standard deviations across all items (ranging from 0.18 to 0.40) indicate high consistency in student responses, suggesting broad agreement about the program's quality and benefits. These results demonstrate that students were extremely satisfied with both the content and perceived benefits of the self-management model for piano training, providing strong validation for the program's design and implementation.

Summary of Results

1. **Needs Assessment**

Students and teachers identified significant gaps in current piano training programs, with high expectations for goal setting, self-monitoring, self-evaluation, and self-reinforcement.

Teachers emphasized the need for practical skills such as children's song accompaniment and improvisation.

2. **Self-Management Model**

The model was developed based on four key dimensions: goal setting, self-monitoring, self-evaluation, and self-reinforcement.

The training program was structured into 10 units, each focusing on theoretical knowledge, practical skills, and stage performance.

3. **Effectiveness of the Training Program**

Pre-test and post-test results showed a significant improvement in students' piano skills, with an average score increase from 9.4 to 28.2 ($p < 0.05$).

The training program was highly effective in enhancing students' piano proficiency and teaching competencies.

4. **Student Satisfaction**

Students expressed high satisfaction with the training program, particularly with the content and benefits gained.

The highest satisfaction was reported for improved piano improvisation skills, stage performance, and mastery of basic piano techniques.

Discussion

The findings of this study highlight the significant impact of integrating a self-management model into a professional piano training program for music students in Hubei, China. The results demonstrate that both students and educators recognize the necessity of a more structured and self-directed learning approach, particularly in the areas of goal setting, self-monitoring, self-evaluation, and self-reinforcement. The high expectations expressed by both students and teachers indicate a strong demand for a training program that not only enhances technical piano skills but also cultivates greater autonomy and self-regulation in learning.

Objective 1. To investigate the needs assessment of students and educational administrators, and teachers towards a professional piano training program for music students.

The needs assessment revealed a significant gap between the current state of piano training and the expectations of students and educators. Students expressed a strong desire for structured self-management strategies, particularly in goal setting and self-reinforcement, which aligns with the findings of Kung & Lin (2021), who emphasized the role of self-regulation in improving learning efficiency.

Furthermore, Liu (2020) noted that many elementary school music teachers in China lack essential practical piano skills, particularly in children's song accompaniment and improvisation, which are crucial for effective music teaching. This skills gap reinforces the necessity for a structured training program that

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not only enhances technical proficiency but also incorporates pedagogical applications tailored to primary school settings.

Objective 2. To develop a self-management model of a professional piano training program for music students in Hubei, China.

The self-management model developed in this study is based on the theory of self-regulated learning (Zimmerman, 1990) and integrates goal setting, self-monitoring, self-evaluation, and self-reinforcement. The model aligns with the findings of Kanfer & Gaelick-Buys (1991), who demonstrated that structured self-management strategies can significantly improve learning outcomes.

Additionally, Jones' (2009) MUSIC model of motivation, which highlights empowerment, usefulness, success, interest, and caring, was incorporated into the model to enhance student engagement and motivation. The model specifically addresses the need for practical skills such as children's song accompaniment and improvisation, which Liu (2020) and Li (2010) identified as essential for primary school music teachers.

Objective 3. To evaluate the effectiveness of the self-management model of a professional piano training program for music students in Hubei, China.

The effectiveness of the self-management model was assessed through pre-test and post-test comparisons, which revealed a significant improvement in students' piano skills and theoretical knowledge. The average score increased from 9.4 to 28.2, demonstrating that the model effectively enhances both technical proficiency and teaching competencies.

These findings are consistent with Bugos & Wang (2022), who found that structured piano training programs enhance cognitive and psychosocial outcomes. Similarly, Coutts (2019) emphasized the role of student autonomy and self-regulation in music education, supporting the idea that self-management models foster independent learning and long-term skill development.

Objective 4. To study student satisfaction with a professional piano training program.

The high levels of student satisfaction with the training program, particularly regarding its content and practical benefits, indicate that the self-management model successfully enhances both technical skills and teaching preparedness.

This aligns with the findings of Liu (2020), who emphasized that practical skills, such as children's song accompaniment and improvisation, are critical for primary school music teachers in China. The inclusion of stage performance and practical application likely contributed to these positive student experiences, as tangible improvements in playing ability and teaching confidence were observed.

Furthermore, Zhang (2005) highlighted the importance of professional development strategies for music teachers, which aligns with students' positive feedback regarding the program's impact on their future teaching careers.

Limitations and Future Research

Despite the study's significant contributions, some limitations must be acknowledged:

1. The sample size was relatively small and predominantly female, which may affect the generalizability of the findings. Future research should include larger and more diverse populations to validate the results.

2. The study focused on a single institution in Hubei, China. Further research is needed to determine whether the self-management model can be effectively implemented in other regions and educational settings.

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Conclusion

This study successfully developed and evaluated a self-management model for a professional piano training program tailored to the needs of music students in Hubei, China. The model, which integrates goal setting, self-monitoring, self-evaluation, and self-reinforcement, has been proven highly effective in improving students' piano skills, self-regulated learning abilities, and teaching competencies.

The significant improvements observed in pre-test and post-test scores, coupled with high student satisfaction, underscore the value of incorporating self-management strategies into music education.

Furthermore, this study contributes to the growing body of research on self-regulated learning and its application in music education. By addressing gaps in current piano training programs and aligning with the practical needs of primary school music teachers, this model provides a promising approach for enhancing the quality of music education in China.

Future research should explore:

- The long-term impact of this model on students' career development.
- Its applicability in other educational settings.
- The integration of educational technology into self-managed piano training.
-

Recommendations

1. Recommendations for Practical Application

1.1 Promotion in Educational Institutions

- Music colleges and training institutions in Hubei Province should adopt this self-management model as a key training strategy.
- Schools should integrate this approach into their curriculum and teacher training programs.
- Universities should organize demonstration workshops to introduce faculty and students to the benefits of self-management strategies in music training.

1.2 Enhancing Teachers' Teaching Practices

Piano teachers should actively incorporate self-management principles into classroom teaching by guiding students to:

- Plan their practice schedules effectively.
- Engage in peer evaluations to develop critical self-reflection.
- Attend professional training sessions on self-management pedagogy.

Educational departments should invite expert lecturers to train teachers on effective self-management strategies for music education.

1.3 Encouraging Student-Led Learning

- Students should recognize the role of self-management in their professional development.
- Learners should set personalized study goals in four key areas:
  Goal Setting: Planning milestones such as competitions and recitals.
  Self-Monitoring: Recording practice sessions for self-analysis.
  Self-Evaluation: Engaging in peer review and teacher feedback sessions.
  Self-Reinforcement: Actively identifying and addressing weaknesses.

2. Recommendations for Further Research

2.1 Optimizing Personalized Learning Paths

- Future studies should explore how to customize self-management strategies based on individual learning styles and abilities.
- Big data analysis and learning behavior tracking can be used to develop tailored self-management plans for students.

2.2 Exploring Socio-Cultural Influences

- Research should examine how regional culture and socio-economic background influence students' self-management behaviors.

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- Community-based programs using Hubei folk music traditions could be explored to enhance student engagement.

2.3 Long-Term Career Impact

- A longitudinal study should track the career progression of students trained under this model.
- The focus should be on how self-management skills support long-term professional growth in the music education industry.

2.4 Integration of Educational Technology

- Emerging technologies such as Virtual Reality (VR) and Artificial Intelligence (AI) should be explored for interactive and immersive piano training experiences.
- Intelligent learning systems can provide real-time performance feedback, further supporting self-managed learning.

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