



Innovative Practical Model of Integrating Traditional Teaching Methods with Modern Teaching Concepts in Music Education

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SUMMARY: *This study employs a quasi-experimental design to empirically examine an innovative instructional model that integrates traditional Chinese music teaching methods with modern, AI-enhanced pedagogical concepts. Data were collected from 240 students enrolled in three major Chinese universities, divided equally into an experimental group and a control group. The experimental group was exposed to an AI-assisted integrated model of music learning, while the control group received traditional instruction only. A comparison of pre-test and post-test results using a standardised music learning achievement test revealed that students in the experimental group demonstrated significantly higher levels of musical performance, creative expression, and learning engagement. These findings confirm the superior efficiency and effectiveness of the AI-assisted instructional model, which has now been adopted by several Chinese universities. The results suggest that the traditional teacher-centred Chinese pedagogical approach can coexist harmoniously with technology-assisted learning. The integration of both approaches yields synergistic benefits: traditional methods cultivate interpretive and expressive artistry, while AI tools enhance mechanical precision and provide real-time, data-driven feedback for targeted skill improvement. Furthermore, students in the AI-assisted learning environment exhibited higher levels of motivation and enthusiasm, attributable to the immediate visual and auditory feedback that helps them identify weaknesses and pursue more disciplined practice. Overall, the study underscores the pedagogical potential of blending cultural heritage with technological innovation to advance music education in China.*

KEYWORDS: *Artificial Intelligence (AI); Music Education; Traditional Chinese Pedagogy; Technology-Enhanced Learning; Music Teaching Innovation*

1 Introduction

There are a range of pedagogical approaches that are commonly used for music education in China that could be broadly categorised as guided repetition, master-apprentice relations, and imitation approaches [1]. Essentially, the range of these methods could be categorised as teacher-centric approaches, as it is the music teacher who provides interpretive insight and embodies his/her expertise and expressive techniques to develop and refine the desired skills.

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The traditional pedagogical approach is popular across China, as there are a range of different strategic benefits associated with these methods. This includes the opportunity to establish deeper emotional engagement with music students, more effective development of musical sensitivity, and transmission of aesthetic values from generation to generation [2]. In particular, [3] are of the view that the traditional pedagogical model has been ensuring music authenticity as the core music norms, values and music aesthetics are transmitted from generation to generation. Nevertheless, the traditional pedagogical approach has been increasingly criticised, as the approach has been suffering from different limitations. This includes lack of solid feedback, limited scalability, and practical difficulties in assessment, as the technical skills needed for music development could not be effectively assessed and evaluated [4]. In particular, [5] is of the view that technical performance like rhythm precision, intonation, and expressive qualities could not be effectively assessed in the traditional pedagogical model.

As a result of the range of difficulties that are witnessed in the case of the traditional pedagogical approach, the modern educational paradigm has been gaining greater acceptance across the country. The approach has been largely favoured, as it ensured active engagement of the learner, as the pedagogical approach is considered a learner-centric approach [6]. Furthermore, [7] and [8] have found that the approach is not only based on reflective methodologies, but also the modern approach ensured adaptive learning, providing greater autonomy to learners that was missing in the case of the traditional pedagogical approach. [9] have also favoured the emerging modern pedagogical approach, as the authors believed that the approach ensures metacognition and a continuous feedback process, which results in the continuous development of the desired music skills. [10] have also favoured the modern educational paradigm for music education, as the approach encouraged student self-monitoring, which is essential for the development of the desired technical rigour and creative skills, which are essential in the music industry. Although there are different studies that favour the use of the modern educational paradigm, [11] are critical of the approach, as they believe that the methodology could negatively affect the depth and cultural specificity that are ensured in the traditional music pedagogies. In particular, [12] are of the view that music authenticity, which is ensured in the traditional music pedagogies, could be easily lost in the case of the modern educational paradigm.

As both the traditional approach and modern educational paradigm have relative strengths and suffer from certain weaknesses, there is a strong need for the development of an approach that could integrate the best attributes of the two approaches and provide greater synergies for music education in China [13]. A hybrid approach has been emerging within China that has been largely getting precedence due to the wider application and use of emerging digital technologies. In particular, the artificial intelligence technology has been increasingly adopted as a component of the modern educational paradigm, and it is combined with the traditional Chinese music pedagogical approach [14]. The hybrid approach thus emerging provides the greatest advantages, as the method is effective for performance evaluation, ensures real-time feedback, and is more personalised for learning suitable as per the individual's needs [15]. This in turn implies that through the application of the AI technology some of the major limitations of the traditional music pedagogical approach adopted in China could be more effectively addressed, while at the same time the strategic benefits of the modern educational paradigm could be realised.

The hybrid approach that has been adopted in different parts of the world for music education offered a range of tangible and intangible benefits. In particular, significant progress in terms of music education could be realised through the application and use of the hybrid approach that integrates AI technology with the traditional music educational paradigm. This research has been organised with the aim of designing a practical integration model that

combines traditional pedagogy with AI-driven feedback and adaptivity in music education. The research is based on a quasi-experimental music teaching context and collects performance, motivational, and perceptual data, as the study determines the effectiveness of the suggested model through a range of performance metrics and motivation scales.

2 Material and Methods

2.1 Research Design

The findings regarding how traditional music teaching methods can be effectively integrated with modern educational concepts through AI without losing artistic depth and cultural integrity are based on the positivism research philosophy that employs a quantitative quasi-experimental design. Through analysis of quantitative data collected and analysed, the study could be helpful in determining whether the emerging innovative practical model could enhance Chinese music students' music performance, creativity, and engagement. The findings of the study are based on two groups, which include an experimental group and a control group. First, benchmarks have been established for the two groups, and then the AI-assisted teaching pedagogies have been introduced to evaluate the impact of such a pedagogical approach on students' performance, creativity and engagement.

2.2 Participants of the study

The participants selected for the quasi-experiment regarding how traditional music teaching methods can be effectively integrated with modern educational concepts through AI without losing artistic depth and cultural integrity are based on data collected from 240 undergraduate students who have been enrolled in three different Chinese universities. As the research ensured full confidentiality of the participants of the research, the names of these universities have been anonymised throughout the study. The participants of the study have been selected using a stratified random sampling procedure, and all the participants have been grouped into categories. The first group is the experimental group, which is comprised of 120 students who have been given the music learning opportunity to learn music skills through a hybrid approach. This group thus received learning instruction through an innovative practical model integrated with the traditional Chinese pedagogies. The second group of the study also comprised 120 participants; however, this group continued receiving music learning instructions through the conventional Chinese pedagogical approach.

2.3 Research Instrument

For the sake of the quasi-experiment, this study adopted the Music Learning Achievement Test, which has been used by [15] and [16] as a standardised assessment method for analysing musical performance and theoretical understanding. The test evaluates students' music learning in three different categories vis-à-vis musical theory, technical proficiency and creative interpretation. The test has 30 multiple-choice questions. The test has been adopted in the study because of its high reliability, as [15] and [16] have established that it has a Cronbach's of 0.89, pointing towards a very high degree of internal reliability that will certainly contribute to the validity and reliability of the current study and overall generalisation of the findings.

2.4 Experimental Process

The experiment regarding how traditional music teaching methods can be effectively integrated with modern educational concepts through AI without losing artistic depth and cultural integrity

consisted of a 16-week-long process. There were three phases of the experiment, which include the pre-test, the intervention phase and the post-test week. The pre-test was conducted in the first week, where a baseline benchmark was established as students in both experimental and control groups completed the music learning achievement test. The scores for all the students were established. This led to the intervention phase, which started from week 2 and lasted until week 15. In this phase the control group continued receiving music learning instructions through the conventional pedagogical approach; however, the experimental group was provided instructions through an innovative practical model that integrates AI and conventional Chinese teaching pedagogies. Once the intervention process has been completed, in week 16, all the participants of the study undertake a musical learning achievement test. For the sake of this experiment, the pre-test scores and the post-test scores were compared and contrasted, which helped in better evaluating in what manner the traditional music teaching methods can be effectively integrated with modern educational concepts through AI without losing artistic depth and cultural integrity.

2.5 Data Analysis

The data analysis in this study has been conducted using a variety of statistical tools and methods. First, descriptive statistical analysis tools like means and standard deviations have been used to summarise overall performance trends of the students in two groups. The mean has been calculated using the following formula:

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$

In the above formula \bar{X} denotes mean score, X_i denotes individual score and n is the number of participants.

Standard deviation has been used in the study to calculate dispersion from the mean. The following formula has been adopted for calculating standard deviation:

$$SD = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

In the above formula, SD denotes standard deviation, X_i is individual score, \bar{X} is the mean score and n is the number of participants.

Furthermore, correlation coefficient has been used to measure the linear relation between usage hours and learning improvements. The following formula has been used for the measurement of correlation coefficient:

$$r = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$$

In the above formula r denotes correlation coefficient, X is the AI usage hours, Y is learning improvement and n is the number of observation.

Furthermore, Cronbach's tests have been conducted in the study to compare pre-test and post-test scores within each group to analyse the extent to which improvements in the student

musical performance have been noted over the experimental period. The following formula has been used for the calculation of Cohen's d effect:

$$d = \frac{\bar{X}_1 - \bar{X}_2}{S_p}$$

In the above formula, \bar{X}_1 , \bar{X}_2 denotes means of experimental and control groups, while S_p denotes pooled standard deviation.

3 Results

3.1 Pre-Test and Post-Test Score

As pointed out earlier, the study involved a music learning achievement test, which has been conducted at two different points in time. The first test was conducted for both the control and experimental groups at the start of the study, while the second test has been conducted after the 15-week study undertaken by the two groups of participants. The following Table 1 summarised the pre-test and post scores for the control and experimental groups that participated in the study:

Table 1: Pre-test and Post-test Scores of Control and Experimental Groups

Group	Pre-Test Score	Post-Test Score
Control Group	66.45	74.26
Experimental Group	66.88	82.91

The comparison of pre-test and post-test average scores of control and experimental groups has been exhibited in the following Figure 1:

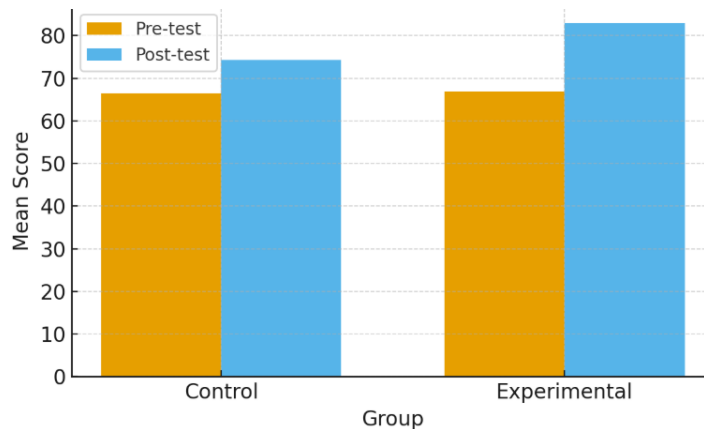


Figure 1: Comparison of Pre-Test and Post-Test Scores

From the analysis of Figure 1, one could see that there was rarely a difference between the pre-test scores of the two groups, as the average score of the control group at the pre-test level was 66.45 and the experimental group was 66.88. However, after the learning intervention strategies were differently introduced to the control and experimental groups, significant differences in terms of music learning achievement tests have been witnessed between the control and experimental groups. The post-test score for the experimental group has been recorded as 74.26; however, this score for the experimental group stood at 82.91. This in turn means that the students who received the AI-assisted music learning coupled with the traditional

Chinese learning pedagogies witnessed a significantly better music learning experience, evaluated through a music learning achievement test. From Figure 1, one could clearly see that the post-test bar chart rises more sharply, pointing towards strong progress in terms of the music learning achievement test using the AI-integrated learning environment.

3.2 Distribution of Post-Test Student Scores

The histogram for the post-test score of frequency distribution could be conducted with the aim to more closely analyse the variance in terms of performance after the intervention strategy introduced from Week 2 till Week 15 of the study. The histogram of post-test student scores has been exhibited in the following Figure 2 for both control and experimental groups.

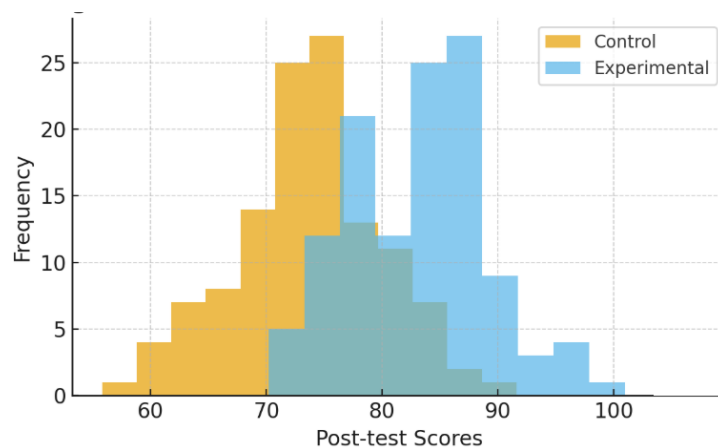


Figure 2: Histogram of Post-test score of Control and Experimental Group

From the analysis of Figure 2, one could see the control group post-test score centred around 74. Variation within the group score could be witnessed; however, such variation is only moderate in nature. Contrary to this, from the analysis of Figure 2, one could see that the experimental group post-test score has witnessed a sharp increase towards the right side. The peak average score is 84, which indicates that the participants within this experimental group have witnessed more consistent learning, which has been evaluated through a music learning achievement test.

3.3 Comparison of Learning Gains

The comparison of learning gains could be carried out to more narrowly analyse the score gain of the control and experimental groups. For this purpose, the interquartile range for the control and experimental groups has been conducted and graphically exhibited in the boxplot of learning gain, exhibited in the following Figure 3:

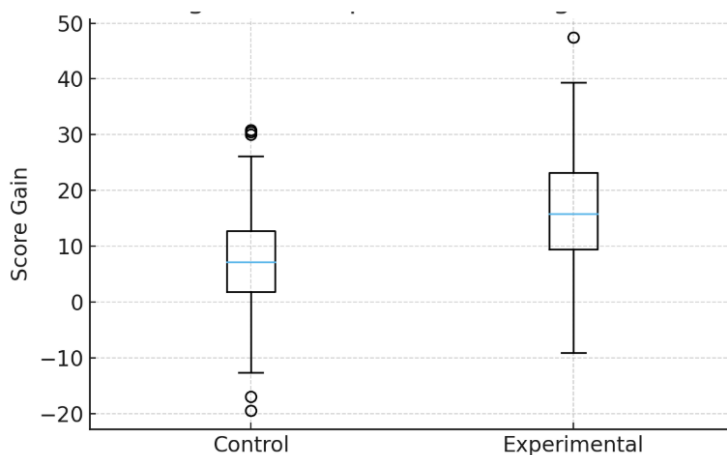


Figure 3: Boxplots of Learning Gain of Control and Experimental Groups

From the analysis of Figure 3, it is pertinent to note that the boxplot for the control group median gain is 9 points. This score for the experimental group is 14 points. This in turn means that the interquartile range for the experimental group in the current study is narrower as compared to the control group. This in turn implies that the experimental group witnessed a more consistent improvement than the control group in the current study.

3.4 Correlations between the AI usage and music learning improvement

As the AI learning intervention has been introduced to the experimental group for an extended period of time that lasted for 15 weeks, learning improvement gains have been consistently witnessed throughout the period. A more consistent viewpoint regarding the relationship between AIT tool usage hours and the learning improvement, evident from the score gains, could be analysed through correlation analysis. The following Figure 4 exhibits the correlations between AI usage hours per week and the learning improvement measured through score gains.

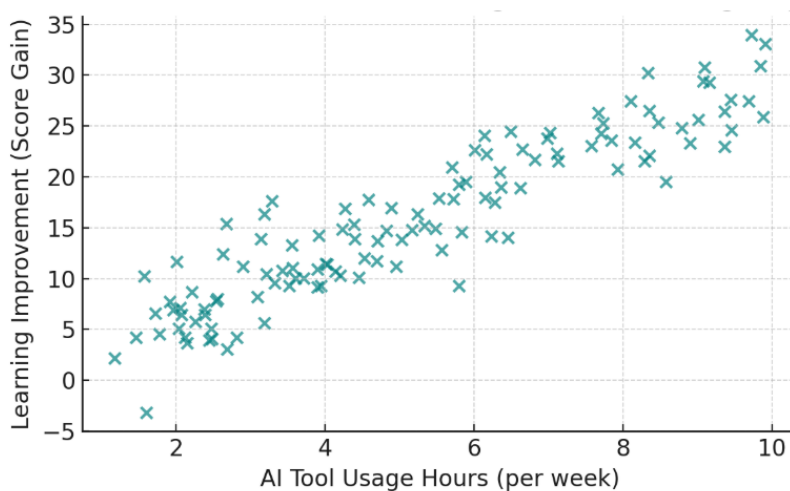


Figure 4: Correlation of AI Tool Usage and Learning Improvement

The scatter plotting visualisation of AI tool usage in terms of hours per week and the post-test improvement exhibited in the above Figure 4 exhibit consistent upward trends. This in turn implies that the increased use of AI as a learning intervention strategy combined with traditional Chinese pedagogies has been resulting in a bigger payback. The experimental group that

consisted of 120 participants has witnessed higher learning gains, pinpointing the significance of the emerging technology in terms of learning improvement.

3.5 Impact Size of Innovative Practice Model Intervention

For establishing the effect of the AI-assisted integration, the Cohen's D calculation has been conducted. The following Figure 5 exhibits the Cohen's d effect size of the innovative practice model in the experimental group.

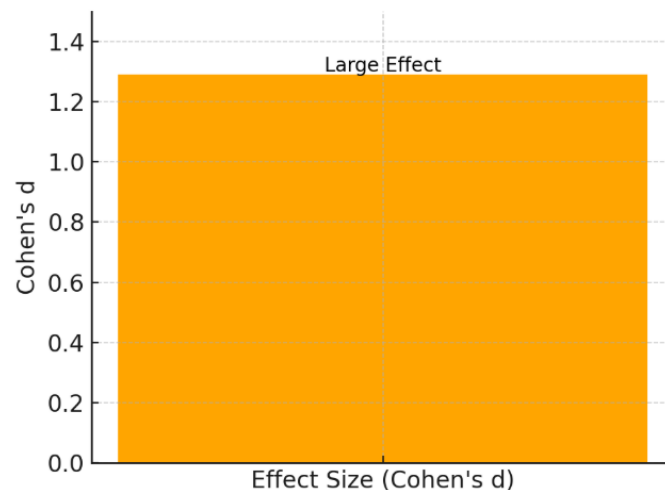


Figure 5: Cohen's d Size Effect Analysis

From the analysis of Figure 5, it is evident that the Cohen's d score of 1.29 has been established in the current study. This score indicates a larger impact size, which denotes that the introduction of AI with the traditional Chinese pedagogies for music teaching in China has been significantly enhancing student music learning performance. This in turn signifies the importance of the hybrid approach, where the AI technology could be integrated with the traditional Chinese teaching for imparting better-centred music education in the country. The integration of the traditional teacher-centric methodology with the AI-driven feedback system could significantly enhance musical skills, creativity and student engagement.

4 Discussions

From the findings explored in the previous pages, it could be inferred that the use of AI-assisted pedagogies integrated with the traditional Chinese approach is associated with significant improvement of student music learning, creative expression and student engagement. As the findings of the study are based on two groups, which include a control group that continued witnessing traditional teaching pedagogies and the experimental group that witnessed AI-assisted pedagogies combined with the traditional teaching approach. The study found that, however, at the control group pre-test and post-test performance points, proved by 7.81, however, this score for the experimental group increased significantly by 16.03 points, indicating a significantly higher impact of the AI-assisted teaching pedagogies. The findings in this regard align with the findings of [16], who have also found that the hybrid approach comprising traditional teaching pedagogies coupled with the AI-assisted feedback and assessment offered greater opportunities for music learning, creative expression, and student engagement.

The significant improvement in music learning made possible through AI-assisted feedback and assessment has resulted in the development of better learning opportunities. Students witnessing the hybrid learning environment get an opportunity to effectively correct their pitch and rhythms; besides, timely feedback generated through the AI-assisted technology helped students to more effectively build their technical skills. From the findings of the study, it could be established that music learners witnessed better opportunities for boosting their music learning skills as they got better emotional support and interpretive depth through the personalised attention that teachers offered in the conventional teaching environment, while at the same time, the AI has been offering the means for objectively measuring the music skills and technical efficiency that the student developed with the passage of time. Additionally, the AI technology could also assist students through repetitive drills, focusing mainly on the areas where the student witnessed some weaknesses. Thus, students witnessing the AI-assisted environment get an opportunity to develop more effective correspondence, technical skills and creative expressions [17]. The findings of the current study correspond with the above mentioned authors, who also praised the hybrid approach for offering the best opportunities for music learning.

Additionally, the findings of the current study also signify that the AI technology should not be used as a replacement for the traditional or modern framework; rather, greater synergies could be accessed when the AI technology is used as a complementary approach to traditional and modern AI frameworks. The integrated approach could be termed as a hybrid approach that combined the best attributes of both traditional Chinese pedagogies and modern AI frameworks. The traditional Chinese teachings are helpful in the development of teacher-driven expressive and intuitive learning, where student expressive qualities could be developed through effective emotional support. On the other hand, the modern AI framework could be used to provide timely feedback and enhance student assessment, providing opportunities for more effective assessment of students' existing skills and competencies and the areas where a student could focus upon to develop more effective skills. None of these methods – traditional Chinese or the modern AI – could be termed as a panacea to cure all the different types of music learning; rather, the combined and integrated approach could be termed as the best approach, as they combined the best attributes that could have a long-lasting impact on student music learning skills.

5 Conclusion

This research adopted a quasi-experimental model to empirically evaluate an innovative practical model that integrates traditional Chinese music teaching methods with modern, AI-enhanced pedagogical concepts. The findings of the study are based on the data collected from students that belonged to three major universities of China, who have been divided into two groups, which include a control group and an experimental group, each consisting of 120 participants. As per the comparison of the pre-test and post-test using the music learning achievement test, the experimental group that witnessed the AI-assisted integrated model of music learning witnessed significantly better learning that significantly enhanced their music performance, creative expression and learning engagement as compared to the control group that witnessed the traditional teaching alone. The higher skill acquisition rate thus confirmed the greater efficiency and effectiveness of the AI-assisted model that has now been introduced in different universities of China for music teaching. From the findings of the current study, it could be established that the conventional Chinese teaching approach, which is teacher-centric, could harmoniously coexist with the technology-assisted pedagogical approach. Greater synergies could be witnessed through the integrated approach, as traditional teaching

philosophies could be leveraged to develop and nurture student interpretive expression, while the AI-assisted technology could be adopted for ensuring mechanical and technical accuracy through the provision of timely feedback and identification of weaker areas that could be focused on in future practices. Additionally, the study also found that students who are engaged in the AI-assisted environment have been showing greater enthusiasm and motivation that could be linked to the better engagement of students through the technology-assisted feedback. The real-time feedback that could take the form of visual or auditory feedback has been showing greater encouragement for the students, as they could easily identify their potential weaknesses that lead towards a more disciplined development.

About the Author

Mengge Lu, born in Jinan, Shandong, China, is currently a doctoral candidate at the School of Music and Recording Arts, Communication University of China. Her primary research interests include music communication and music education.

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