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Enhancing academic achievement and artistic appreciation in music students through inquiry and task-based learning: An experimental study

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ABSTRACT

This study examines the effectiveness of a blended instructional approach combining Inquiry-Based Learning (IBL) and Task-Based Learning (TBL) in enhancing academic achievement and artistic appreciation among music performance students. Fifty second-year students from Beijing City College participated divided into an experimental group using the blended instructional approach and a control group following traditional teaching methods. The intervention lasted two months and its impact was evaluated through pre- and post-intervention comparisons of academic achievement and artistic appreciation. Results revealed significant improvements in the experimental group with mean academic achievement increasing from 115.12 ± 4.53 to 117.56 ± 4.16 ($P<0.05$) and mean artistic appreciation rising from 75.24 ± 3.40 to 76.84 ± 3.91 ($P<0.05$). Additionally, the experimental group outperformed the control group in academic achievement ($t=-6.866$, Cohen's $d=1.373$) and artistic appreciation ($t=-7.333$, Cohen's $d=1.467$). These findings suggest that integrating IBL and TBL provides a robust framework for improving cognitive and artistic outcomes in music education, offering teachers an effective alternative to traditional teaching methods.

Contribution/ Originality: This study contributes to the field by combining Inquiry-Based Learning (IBL) and Task-Based Learning (TBL) in music education, an approach previously underexplored. This research integrates the two methods to enhance both academic achievement and artistic appreciation, offering a dual focus on critical thinking and practical application in music education unlike prior studies focusing on either IBL or TBL separately.

1. INTRODUCTION

Music education carries the mission of cultivating students' artistic literacy, creativity and aesthetic appeal belonging to the category of aesthetic education. In addition to learning music, music majors are crucial recipients of music education, and their training aims to improve their creative literacy, creativity, and cultural awareness.

The importance of this group is reflected in their ability to interpret musical works, their creativity and their transmission of emotional and cultural connotations, all of which have a profound impact on their future career development and the overall quality of music education (Costes-Onishi & Kwek, 2023). However, its pedagogical practices often fail to realize their full potential despite the clear educational goals of the music performance program.

The present music performance teaching mainly focuses on technical training and theoretical knowledge transfer but pays insufficient attention to students' personalized development and comprehensive ability cultivation. Some studies have pointed out that a lot of practice may be indispensable to truly improve students' artistic

expression. However, in practice, although long-term practice can significantly improve students' performance skills, it often leads to weaknesses in their emotional expression and deep understanding of the cultural background of musical works (Juslin & Sloboda, 2011). In the short run, this single-goal teaching model may boost the quality of performance significantly. In the long run, it stunts students' holistic perceptions and deeper expressiveness in the art of music. Such performances in the end may not hold any emotional value and substance for the audience and lose the essential value of musical performance as an art form.

Most studies are tending to witness the introduction of new innovative teaching-learning methods that would help balance technical training against artistic expression for compensating for what already seems a limitation of the traditional arts education system because of the current deficiencies in training music performance education (Cui & Chen, 2024). Inquiry-Based Learning (IBL) and Task-Based Learning (TBL) have been successfully practiced in other disciplines and are gradually attracting attention in the field of music education (Franc & Morton, 2014). That's why research has found such teaching methods to greatly enhance outcomes-not just in improving the comprehensive ability of students but also in awakening their potential for self-learning and creativity and it may even find ways of informing deeper reform in music performance education (Chen, 2023).

Research indicates improving students' critical thinking skills through IBL is demanded in music education (Johnson, 2011). Critical thinking is higher-order thinking that involves the ability to analyze, evaluate, and solve problems (Miterianifa, Ashadi, Saputro, & Suciati, 2021). Such understanding is required that enable students to understand all the theory properly and analyze the structures and style of a work as well as the intentions of the composer. Going deeper might go beyond the music's simple, surface-level environment to examine the work's cultural relevance, historical background, and intentions (Vasconcelos, Caspurro, & Costa, 2023). On the other hand, TBL translates theoretical knowledge into practical skills through contextualized performance tasks that enhance the overall perception of a musical work (Costes-Onishi & Kwek, 2023). IBL provides theoretical support and problematic background for TBL by stimulating students' ability to ask questions and think deeply while TBL further deepens the understanding and expression of musical works by putting the knowledge and skills gained in the inquiry process into application through specific practical tasks.

The purpose of this study is to investigate whether a teaching method that combines IBL and TBL can effectively enhance students' academic achievement and artistic appreciation in music performance education. Therefore, this study will address the following two questions: (1) Are the academic performance and artistic appreciation of students learning through an instructional approach based on inquiry learning and TBL higher than before learning? (2) Do the students learning through an instructional approach based on inquiry learning and TBL differ in academic performance and artistic appreciation compared to those in the control group?

2. LITERATURE REVIEW

2.1. What is Inquiry-Based Learning (IBL)?

Questions are the starting point of scientific research and the key to unlocking any science. Marks (2013) articulates that questions are the logical force behind the accumulation and development of ideas and methods, and are the seeds for the growth of new ideas, methods, and knowledge. IBL, also called the discovery method and research method is a method in which students learn concepts and principles and the teacher just gives them some examples and questions so that the students can discover and master the corresponding principles and conclusions on their by reading, observing, experimenting, thinking, discussing and listening to lectures and other ways of independent inquiry (Acar & Tuncdogan, 2019). The earliest proponent of the use of inquiry in teaching was Dewey who argued that science education was not about students learning a great deal of knowledge but more importantly about the process or method of scientific research (Herman & Pinard, 2015). From 1950 to 1960, the rationale for inquiry as a teaching method became increasingly clear.

The modern pedagogical research points out that the root cause of learning is questions. The starting point for IBL is to set questions that need to be answered which is the starting point for further inquiry (Pedaste et al., 2015). It is challenging to provoke and stimulate students' curiosity without a challenge but if they do not sense the problem's presence, they will not go further into their thoughts; therefore, learning can just be the surface and form of it. On the one hand, learning through questions is emphasized. Questions are regarded as the driving force, the starting point and the main thread running through the learning process. On the other hand, questions are generated through learning and the learning process is regarded as the process of discovering, raising, analyzing and solving questions. IBL takes students as the main body and allows them to explore consciously and actively, master the methods and steps of understanding and problem- solving, study the properties of objective things, discover the causes of the development of things and the connections within things, find out the laws from them and form their concepts, and the students' subjective position and autonomy have been strengthened (Aghazadeh, 2020).

Rodríguez-Arteche and Martínez-Aznar (2016) found in their experiments that conducting experimental investigations in problematic situations rich in open-ended questions is a key step in teaching and learning. Teachers should first help students to draw up a reasonable research plan and choose appropriate methods. At the same time, teachers are required to provide certain experimental conditions or necessary information for students to experiment or consult on their to seek answers to questions and put forward certain hypotheses. At this time, the teacher plays the role of an organizer to guide and regulate the students' exploration process. This process can be accomplished by individual students or by the teacher in groups. Attention should be paid to cultivate the team spirit of students seeking cooperation. After the exploration process, students should summarize and sort out their experimental process or the information they have consulted and draw their own conclusions and explanations. Different students or teams can put forward different explanations or views on the same issue. Students should be able to express their conclusions clearly and discuss them together.

The spirit of inquiry is the soul of the classroom. Only inquiry can develop thinkers and critics, and teaching without inquiry is only training. Therefore, Borovay, Shore, Caccese, Yang, and Hua (2019) urged teachers to focus on promoting the spirit of inquiry so that students can live a meaningful life of inquiry in the classroom, discovering problems, asking questions, and trying to solve problems from different dimensions, constructing their ideas and meanings, and generating and forming their concepts in critical reading, observing, manipulating, and thinking. IBL is a change in traditional teaching methods to meet the needs of future society for the development of human learning habits and scientific attitudes. It is also an important and specific goal of the new round of China's national basic education curriculum reform (Yang, Liu, & Liu, 2019).

2.2. What is Task-Based Learning (IBL)?

Those learners who show a high degree of initiative and autonomy in the learning process are often regarded as the ideal model of learners for modern teachers. Task- based learning is one of those educational concepts that was initially applied in the field of language teaching and gradually extended to other disciplines (Anives & Ching, 2022). During language teaching, researchers have focused on how to enhance learners' language learning through active participation, positive interaction and independent inquiry (Navarro & Thornton, 2011). Nowadays, TBL has become a hot topic in the field of modern education and its core concept is to stimulate students' active participation by designing practical tasks and activities to enhance their comprehensive quality and practical application ability.

TBL was first proposed by Prabhu (1987) and he defined TBL in his book Second Language Pedagogy. He argues that considers a task is an activity in which students draw conclusions from given information by thinking about it, an activity that enables them to regulate their own thinking process. Prabhu classifies activities into the following four categories: rule-centered activities, form-centered activities, goal-centered activities, and meaning-centered activities. Prabhu (1987) divides TBL into three key phases which are as follows: pre-task, task, and feedback. In the pre-task stage, the teacher first demonstrates or explains the task that the student is about to

complete and provides appropriate modeling to illustrate it. In the task phase, learners are individually responsible for completing the task, but they may seek assistance from classmates and the teacher. On the other hand, in the feedback phase, the teacher evaluates the task completion.

Candlin (1987) redefined the concept of task as a series of hierarchical and differentiated activities that contain problems especially communicative problems. These activities prompt students and teachers to find solutions to problems through a variety of cognitive and communicative processes and to use new and old knowledge in the contexts created by the activities to explore and achieve the goals that the activities are designed to achieve. Like Prabhu, tasks are viewed as units of curriculum design, and such syllabi are referred to as "process syllabi". This concept of course design stems from an assessment of the integrated syllabus that students learn better through purposeful communication. Unlike Prabhu, new responsibilities are placed on the course designer in that teachers must be highly competent in teaching and students must be more active in their learning (Breen & Candlin, 2001).

The integration of specific tasks into the teaching-learning process so that students learn to behave as if they were in real life is seen as the essence of TBL (Nunan, 1989). Nunan (1992) explicitly defines a task as any classroom activity that requires the learner to comprehend, manipulate, produce, or interact with the target language while focusing primarily on meaning rather than on form. Tasks should also have a sense of integrity and be able to exist as independent communicative acts. The communicative and meaning-oriented nature of the task is such that the teacher's role is to provide assistance and correction when students form incorrect rules. Willis (1996) argues that tasks should be designed to be engaging to motivate learners to actively participate in a variety of interaction types. In her book, A Framework for TBL, Willis defines tasks as explicit goal-oriented activities that provide teachers with practical guidelines for implementing task activities in the classroom through learners' use of targeted resources to solve problems, complete puzzles, play games or share comparative experiences.

3. RESEARCH METHODOLOGY

3.1. Participants

The research sample consisted of second-year undergraduate students majoring in music performance at Beijing City College. The total sample consisted of 50 students of whom 14 (28%) were male and 36 (72%) were female. This gender imbalance is consistent with the overall trend in arts programs where female enrollment tends to be higher than male enrollment (Elpus, 2015). This study focuses on the evaluation of the effectiveness of teaching methods and leaves aside the social and cultural reasons for the gender ratio imbalance. Cluster sampling had been done to divide the 50 students into experimental and control groups, both with 25 each. There were 8 male and 17 female students in the experimental group with a mean age of 19.7±0.57 years while in the control group, there were 6 male and 19 female students with a mean age of 20.2±0.85 years. The experimental group received the IBL and TBL method understanding instructional interventions while the control group used traditional teaching methods.

3.2. Intervention

The principal investigator met with all the participants explained the research goals and expectations of the study and required students to sign an informed consent form before the implementation. The intervention lasted for two months with two or three 45-minute lessons a week. The composition of the experimental group incorporated the principles of IBL and TBL as students engaged in activities like music analysis, group performance preparatory and project-based assignments. Each lesson would have the following three phases: exploration, task performance, and reflective evaluation. The experiment would work individually on a clearly defined topic of a thematic project such as original composition, different interpretations of a classic repertoire and examining the history of a musical genre. These activities are to be realistic and encourage critical thinking, cooperation and creativity. Teachers would guide students throughout the process by encouraging them to ask questions, look for

sources and then present output in class. The control group followed the traditional curriculum that emphasized memorization of notes and teacher instruction with few opportunities for active or creative participation. All participants were post-tested on academic achievement and ability to appreciate musical pieces at the end of the two months of intervention.

3.3. Research Variables

The study presented in this document investigates how teaching approaches affect students enrolled in music courses in terms of their academic performance and appreciation for art. The teaching method was a key independent variable in this research which consisted of the experimental group employing a hybrid method that integrated IBL and TBL while the control group used traditional methods. Dependent variables include academic achievement and artistic appreciation.

3.4. Research Hypotheses

(1) The instructional approach based on inquiry and TBL leads to higher academic achievement and artistic appreciation in students than before.

(2) The instructional approach based on inquiry and TBL leads to varied academic achievements and artistic appreciation when compared with the control group.

3.5. Research Instruments

3.5.1. The Academic Achievement Scale

The academic achievement scale has two parts, i.e., a theoretical knowledge test and a basic skills assessment which are going to determine, more holistic, the level of academic achievement a student has attained as well as their practical abilities. The theoretical knowledge test has to answer 15 multiple-choice- based questions testing my knowledge in music history, music theory and music analysis and need to complete this in 20 minutes. This has a maximum score of 75 marks. The basic skills assessment is conducted by five experts of associate professors and above who assess the students' instrumental performance, vocal technique, performance skills, application of technology based on the Likert 5 scale and is worth 60 marks making a total of 135 marks for the two parts. The scale is made and interpreted based on the school syllabus and analyzed for validity through the Index of Item Objective Congruence (IOC=0.88) which indicates high content validity (Turner & Carlson, 2003). Besides, the scale was administered in a standardized controlled environment to guarantee fairness and reliability.

3.5.2. The Artistic Appreciation Scale

As for the artistic appreciation scale, it is quite an in-depth tool for assessment relative to students' capability to grasp, analyze and critique music compositions. It comprises six major dimensions: comprehension of musical elements, analysis of musical structure, identification of musical style, composer/performer perception, analysis of emotional expression and historical and cultural significance with three specific items for each dimension: 18 items altogether. The scoring is based on a Likert scale of 1-90 assessed by experts whose title is associate professor and above. Validity analysis was investigated by IOC=0.89 which indicates the scale bears high content validity. The scale was administered in a standardized environment.

3.6. Data Analysis

We have collected data that encompasses the pre-intervention and post-intervention results and followed quantitative methods of data analysis. The relevant forms of statistical tests adopted in this research include analysis of variance (ANOVA) and t-test to establish effects of the instructional intervention and comparative analysis between groups. Paired Samples t-test tested hypothesis 1, independent samples t-test tested hypothesis 2,

and ANOVA tested differences in scores of different groups of students in terms of academic achievement and appreciation skills to empirically investigate the generalizability of the effect of the teaching and possible affecting factors. Data were analyzed using SPSS 28.0 statistical software. The significance level was set at .05.

In the following results, N stands for the sample size, M is the mean, and SD is the symbol for standard deviation, which indicates the variability of the data. The t value represents a t-test statistic for comparisons between pre-test and post-test scores while P refers to the level of significance with $P<0.05$ denoting statistically significant differences. Cohen's d indicates the effect size where larger values imply stronger effects of the intervention.

3.7. Ethical Approval

This study was conducted in strict compliance with ethical norms. The study protocol was approved by the ethics committees of Nakhon Phanom University before implementation. All students signed a written informed consent form after being fully informed of the purpose, content and potential risks of the study. The experimental data were sealed after the completion of the experiment to ensure the privacy and security of the participants.

4. RESULTS

4.1. Hypotheses 1

Table 1 shows the results of the comparison between the students in the experimental group before and after the intervention on academic achievement and artistic appreciation. The M of the students on both indicators was significantly higher after the intervention. The M for academic achievement before the intervention was 115.12 (SD=4.53) and improved to 117.56 (SD=4.16) after the intervention. A paired-samples t-test showed a statistically significant difference (t=-10.539, P<0.05) and a Cohen's d of 2.108 suggesting that the effect of the intervention was of great practical significance. While the M of artistic appreciation before the intervention was 75.24 (SD=3.40) similarly increased to 76.84 (SD=3.91, t=-8.764, P<0.05) after the intervention, the actual effect of the intervention on improving artistic appreciation was more significant (Cohen's d=1.753). The significant positive impact of the intervention on both students' academic achievement and artistic appreciation skills indicates the effectiveness of this hybrid teaching method. Therefore, we can accept hypothesis 1.

Table 1. The pre- and post-test results of academic achievement and artistic appreciation in the experiment group.

Variables	N	M	SD	T	P	Cohen's d
Academic achievement						
Pre-test	25	115.12	4.53	-10.539	0.000*	2.108
Post-test	25	117.56	4.16			
Artistic appreciation						
Pre-test	25	75.24	3.40	-8.764	0.000*	1.753
Post-test	25	76.84	3.91			

Note: *P<0.05.

4.2. Hypotheses 2

We compared the pre-test scores of academic achievement and artistic appreciation between the experimental and control groups before the intervention and the results in Table 2 show that there was no statistically significant difference between the two groups before the intervention which provides a good benchmark for subsequent intervention studies. Specifically, the gap between the control and the experimental group in academic achievement was not significant (t=1.22, P>0.05, Cohen's d=0.244), with M=115.44, SD=3.91 and M=115.12, SD=4.53, respectively. In artistic appreciation, the difference between the two groups was also not statistically significant (t=1.19, P>0.05, Cohen's d=0.237), with M=75.00, SD=3.85 and M=75.24, SD=3.40, respectively. These results ensure the scientific validity of the intervention study and the credibility of the results. The consistency between the

two groups on the pre-test results provided a good starting standard allowing any differences detected at follow-up to be more accurately attributed to the effects of the instructional intervention.

Table 2. The pre-test results of academic achievement and artistic appreciation between experiment and control groups.

Variables	N	M	SD	T	P	Cohen's d
Academic achievement						
Control group	25	115.44	3.91	1.22	0.235	0.244
Experimental group	25	115.12	4.53			
Artistic appreciation						
Control group	25	75.00	3.85	1.19	0.247	0.237
Experimental group	25	75.24	3.40			

Based on the results in Table 2, we compared the results of the two groups in the post-tests of academic achievement and artistic appreciation in Table 3. The results show that the experimental group is significantly better than the control group in both indicators which indicates that the teaching intervention has achieved a significant effect. In particular, the academic achievement of the control group (M=115.52, SD=3.95) was lower than experimental group (M=117.56, SD=4.16). The independent samples t-test indicated that the difference between the two groups was statistically considerable (t=-6.866, p<0.05, Cohen's d=1.373). Similar results were found in the artistic appreciation program. The control group was lower than (M=75.08, SD=3.84) than the experimental group (M=76.84, SD=3.91). Further results indicated a strong practical effect of the intervention on the improvement of artistic appreciation (t=-7.333, P<0.05, Cohen's d=1.467). These results demonstrated the significant contribution of the instructional intervention to students' academic achievement and artistic appreciation providing strong empirical support for the effectiveness of the instructional strategy. Thus, we can accept hypothesis 2.

Table 3. The post-test results of academic achievement and artistic appreciation between experiment and control groups.

Variables	N	Mean	SD	t	P	Cohen's d
Academic achievement						
Control group	25	115.52	3.95	-6.866	0.000*	1.373
Experimental group	25	117.56	4.16			
Artistic appreciation						
Control group	25	75.08	3.84	-7.333	0.000*	1.467
Experimental group	25	76.84	3.91			

Note: *P<0.05.

5. DISCUSSION

Arts education, especially music education requires innovative teaching methods. Crawford (2017) suggests that in the Internet era, the mode of information acquisition and knowledge dissemination has undergone a disruptive change and a single teacher-led teaching is no longer able to meet students' needs for diversified learning. As early as the last century, Broudy (1958) pointed out that music education should not be limited to the teaching of skills and the imitation of works but should go deeper to stimulate students' creativity, critical thinking and emotional expression. Diverse and flexible teaching methods may be one of the keys to solve this dilemma. The development of science and technology and the increased social demand for interdisciplinary talents make it necessary for music education to incorporate modern technological means and cross-disciplinary learning, such as the use of multimedia technology, artificial intelligence composition software or the combination of music with literature, history, science and technology and other disciplines, to broaden students' knowledge horizons (Zheng, Zhang, & Zhang, 2024). These innovative teaching methods can more effectively adapt to the needs of students' individualized development, closely link the teaching content with practical applications, and improve students' learning interest and initiative. Innovations in music education can bridge the gap between collaborative and socio-

emotional skill development which have been neglected in traditional teaching and provide students with opportunities for holistic development.

Athuman (2017) used a quasi-experimental design to compare the effectiveness of IBL modules with traditional teaching methods. On the other hand, Abdallah and Mansour (2015) compared a traditional lecture-based writing course with virtual task-based contextualized language learning demonstrating the effectiveness of the latter in the development of EFL practical writing skills. These studies not only validate the effectiveness of innovative teaching methods but also reveal their advantages over traditional teaching in terms of flexibility, engagement, and usefulness. However, the present study further demonstrates that the combination of IBL and TBL can have a dual contribution to students' academic achievement and art appreciation while these studies mainly focused on a single innovative teaching method versus traditional teaching. The logic of this combination lies in combining the critical thinking development of IBL with the practical application enhancement of TBL which enables students to gain deeper understanding and experience in the interaction between theory and practice. The improvement in academic performance is consistent with the findings of Hughes and Ellefson (2013) who showed that innovative instructional design can significantly enhance student learning. At the same time, the increase in art appreciation suggests that innovative approaches are indeed effective in the cognitive domain but can also play a positive role in the affective and aesthetic domains.

The blend of IBL and TBL creates a complete learning closure by connecting abstract questions to concrete outcomes significantly enhancing the learning experience and outcomes for students. Students develop critical thinking and problem-solving skills by asking questions, analyzing them and searching for answers. On the other hand, TBL concretizes the learning objectives so that students can experience the practical application of knowledge through hands-on practice. When the two are combined, the depth of inquiry and the goal orientation of the task complement each other providing students with a richer learning path. It is worth noting that after our experiment, we found that the students in the experimental group first explored the historical background of the style when they were given a new score, extracted the core concepts and cultural connotations from it and then translated their knowledge into practical outcomes by composing musical works. This effect is exactly what we are looking for (maintaining intrinsic drive) (Ocak & Uluyol, 2010). Students actively construct these notes throughout the process from asking questions to completing tasks. The shift in roles inspires students to be enthusiastic and engaged in learning which further enhances learning outcomes. The thinking orientation of IBL is complemented by the practice orientation of TBL, i.e., academic and skill enhancement and the building of a sense of achievement and meaning in learning.

The findings of this study are encouraging but they additionally highlight some issues that need more study. For example, through what specific mechanisms does arts education affect academic achievement? Understanding these mechanisms could help teachers design more targeted and effective interventions. Another important area of research is the long-term impact of arts-integrated instruction. This study demonstrated short-term gains in academic achievement and arts appreciation but whether these benefits persist over time or translate into broader outcomes (e.g., career success or lifelong learning) is unclear. Longitudinal studies can provide valuable insights into the lasting impact of arts education and its role in shaping students' developmental trajectories. Future research should explore how arts-integrated teaching methods can be adapted to different cultural and educational contexts.

6. CONCLUSION

This research focused on the fundamental ramifications of the engagement of IBL and TBL in transforming academic performance and the aesthetic pursuit of music students. The results showed that this blended approach effectively addressed the limitations of traditional teaching methods by developing students' critical thinking, creativity, and practical application skills comparing the results before and after in the experimental group as well

as between the experimental and control groups. The results indicated that students of the experimental group had advanced both in knowledge concerning music, skills and in the understanding and the enjoyment of the music works. It is recommended that future studies should delve into the prospect of sustaining the effects of this strategy in the long run and also look at cultural and educational contexts to which it can be tweaked for better purposes in music studies especially and other areas too.

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