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The Effect of BOPPPS Lesson Plan of Blended Learning on Non-piano Major Music Students' Piano Performance at Guang Zhou University, People Republic of China

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Abstract:- *Piano group courses help today's music students prepare for their practical career applications in many music fields (education, performance, therapy, etc.) in the future, however, with the progress of science and technology, higher education can use information technology to provide students with more opportunities and higher learning quality. Thus, this research aims to investigate the relationship between self-efficacy and piano performance of non-piano major music students after implementing the 8-week BOPPPS blended piano group learning lesson plan. a quasi-experiment and quantitative research method were adopted for the teaching of blended piano group lessons for 8 weeks on the 91suke teaching platform under the theoretical guidance of the BOPPPS（bridge-in, objects, pre-assessment, participatory learning, post-assessment, and summary) teaching model. The purposes of this research were to 1) confirm whether this blended teaching plan can improve students' piano performance and students' sense of self-efficacy towards piano courses; 2) To explore whether students' self-efficacy is related to their piano performance. The participants were 60 non-piano major freshmen aged 18-21 from the Faculty of Music and Dance, Guangzhou University, China. 30 samples were allocated to the control group, and the other 30 samples were to the experimental group. The control group used traditional teaching methods, while the experimental group used blended teaching methods. The paired sample t-test and correlation analysis were used for the hypothesis test. The results showed that the before and after experiment differences in piano performance scores (including piano performance skills) and self-efficacy of the experimental group students were significant compared with the control group, and the two were correlated. Therefore, the blended piano lesson plan is an effective way to improve students' piano performance. In addition, students' self-efficacy is also a related factor that affects students' piano performance scores.*

Keywords: BOPPPS Lesson Plan; Group Piano Blended Learning; Non- Piano Major Music Students; Piano Performance; Self-Efficacy; 91Suke Platform

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Introduction

Piano group courses help today's music students prepare for their practical career applications in many music fields (education, performance, therapy, etc.) in the future (Rachel D.Hahn，2019).

Compared with the traditional "one-to-one" teaching mode of piano lessons, the group piano course can teach multiple students at the same time, effectively alleviating the problem of teachers' shortage. However, the imbalance between students' knowledge structure and learning ability is becoming increasingly prominent. Due to the large differences in students' learning foundations, some students even have no access to the piano. They are weak in the foundation and low in learning enthusiasm. (Dai, 2019). The teaching time of group piano lessons is very limited, which is difficult to meet the needs of students. Some music educators believe that the current group piano practice does not provide enough piano skill training. (Young, 2013). It can be seen that teachers of group piano lessons need to develop extremely effective methods to solve the individual needs of students in the classroom and improve their piano playing ability and level.

With the progress of science and technology, higher education can use information technology to provide students with more opportunities and higher learning quality (Schmidt Jones, 2015). Dewi (2014) believed that the teaching of the technical platform has expanded the platform for communication between teachers and students, and provided technical support to reverse the dilemma of traditional piano group teaching. From the current research status of the blended piano group lesson, there is little empirical research on the group piano context and curriculum, and there is still broad space for exploration and research on the blended piano group lesson. (Pike. 2014). Due to the emergence of the COVID-19 epidemic in 2019, the researcher in this paper also has accumulated early experience in the use of 91suke platform technology for piano group teaching.

Therefore, in the context of today's educational information technology teaching and COVID-19, this research constructed and designed the blended teaching piano group lesson plan based on the 91 suke platform， using the BOPPPS teaching theory model.

Research Objectives

1. To confirm whether the piano performance of non-piano major music students has improved after the implementation of the 8-week BOPPPS blended piano group learning lesson plan.

2. To determine whether the self-efficacy towards piano lessons of non-piano major music college students has improved after the implementation of the 8 weeks BOPPPS blended piano group learning lesson plan.

3. To explore the relationship between self-efficacy and piano performance of non-piano major music students after implementing the 8 weeks BOPPPS blended piano group learning lesson plan.

Literature Review

Piano group lesson

The piano group lesson is the first piano teaching method used in the United States since 1889 (Todd, 2013). Since the group piano lesson was introduced in China in the 1990s, the teaching content,

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teaching methods, and teaching methods of group lessons have become the key issues in the research of piano teaching reform in universities.

Group piano teaching is very suitable for piano learning at the junior and intermediate levels. (Daniel, 2004). The group piano lesson is a good platform for students to experience discovery learning, which is more effective than the receptive learning often used in one-to-one piano lessons.

However, there are also many difficulties and problems in group piano lessons. Pace, R. (1978) has proposed that "individual differences in groups are more difficult to deal with than differences in individual lessons".

The teaching of group piano lessons is not only a simple collection of students, it brings more challenges to piano teachers.

Blended learning

Blended learning is the result of reflection on the experience and lessons of many years' practices of "web-based learning" in countries represented by the United States. (Mohamed Amin, et, al, 2014). Okaz (2015) believes that blended teaching is a mixture of traditional face-to-face classroom teaching and online teaching. It is not only a mixture of learning methods but also a mixture of learning environments. Orton Johnson (2009) also believes that blended learning is a technical term for teaching using modern information technology, which provides a new learning method for generating, allocating, and receiving a college education, and realizes the integration and optimization of teaching resources.

For the contemporary "digital aboriginal" college students, blended teaching has realized the innovation of traditional teaching mode and will become the trend of future teaching development, which is also the inevitable development of teaching informatization advocated by China (Shu et al., 2019).

BOPPPS Teaching model

Many researchers have applied widely used relatively perfect and mature teaching models in blended teaching practice research to provide theoretical guidance for blended teaching. Among them, the BOPPPS teaching mode is a new way of covering the whole teaching process. Its practice theory was first proposed and formed in North American universities, and then gradually spread to Europe and East Asia, becoming a widely used teaching concept in university education (Cao and Yin, 2016). The BOPPPS teaching mode provides a step-by-step teaching method, allowing students to slowly experience the process of accepting knowledge from scratch, and helping students develop the ability to analyze and solve problems (Murray & Wandio, 2013).

Piano Performance

The piano is a keyboard instrument with strings (Phanichraksaphong, V., 2021). The piano is an instrument used to play beautiful music, which is capable of producing music with complex emotions. In piano music, players make instant compositions and performances based on inspiration or the progression of the piece (Kim et al., 2022).

Technical skills

Technical skills refer to the musical categories developed for this piano performance skill evaluation scale included, tempo, rhythm, articulation, technique, Interpretation, dynamics, tone, pedaling, and memory (Shin Young Kim, 2000).

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Music expression

The essence of music expression in piano performance is the expression of musicians' inner feelings, subtle emotional processing, and accompanied by good body language expression (Hidehiro Nakahara et al., 2009).

Completeness of the Performance

Performance should be evaluated as a whole. It is based on the transmission and understanding of musical works and piano skills (Johnson, P. 1997).

Degree of difficulty

The difficulty of etudes usually represents the difficulty of piano works. These are considered as resources to improve the performance ability of musical instruments and solve technical problems. (Aguer Alper, 2021) In general, Czerny 740, 299, and 599 represent China's primary, intermediate and advanced levels (Zhang, 2009).

Self-efficacy

In short, self-efficacy is an individual's belief in his ability to succeed in a particular situation. Learning self-efficacy refers to an individual's belief in his own learning ability (Bandura, 1989) The sense of self-efficacy in piano lessons refers to the student's evaluation of their own piano skills, knowledge and abilities, and their own beliefs after learning piano lessons (Kurtuldu and Bulut, 2017).

91 Suke

91 Suke is a mobile information classroom based on WeChat mobile official account, which facilitates classroom teaching and online teaching, provides personalized, intelligent, and data platform support for teaching and learning, and creates an efficient, intelligent and interactive learning environment. Students can make full use of their trivial time to learn without installing any apps (Zhang,2021).

Research Conceptual Framework

This research is an empirical study, which uses quantitative methods to conduct a quasi-experimental study to verify the effectiveness of the blended teaching plan used in piano group teaching, to confirm whether this teaching method can improve students' piano performance and self-efficacy, and to explore whether the two have a positive correlation. The conceptual framework is as figure1 follows:

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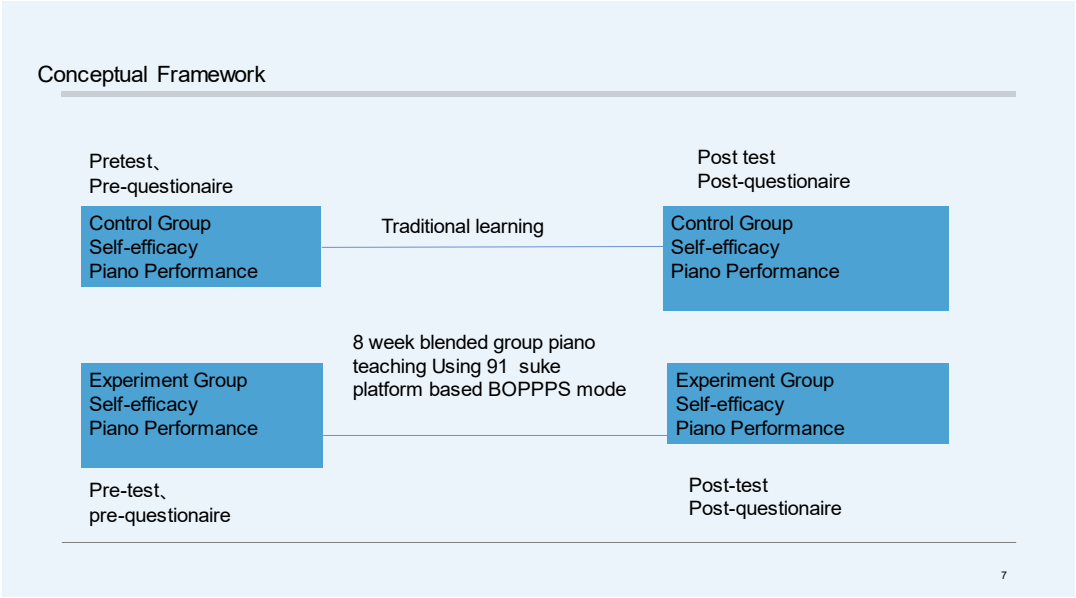

Figure1 Conceptual framework

According to the conceptual framework, the research hypotheses are designed as follows：

Ha1: There is a difference in self-efficacy levels before and after students learn piano using the blended lesson plan.

Ha2: There is a difference in piano performance scores before and after students learn piano using the blended lesson plan.

Ha2a: There is a difference in piano technical skills scores before and after students learn piano using the blended lesson plan.

Ha2b: There is a difference in music expression scores before and after students learn piano using the blended lesson plan.

Ha2c: There is a difference in completeness scores before and after students learn piano using the blended lesson plan.

Ha2d: There is a difference in the degree of difficulty of repertoire scores before and after students learn piano using the blended lesson plan.

Ha3: There is a positive correlation between students' piano performance with self-efficacy.

Research Methodology

Population and sample

The population of this study are 60 freshmen of non-piano majors from the faculty of Music and Dance faculty of Guangzhou University. Adopt the census sampling technology, and select all as samples. They come from two different piano group classes: class 1 and class 2, each with 30 students. Class 1 is set as the experimental group, and Class 2 is set as the control group.

Research instrument： Two research instruments were used in this study:

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Piano performance examination

The piano performance examination adopts the piano examination scoring standard in the syllabus of the Faculty of Music and Dance of Guangzhou University, It covers four aspects of piano playing techniques and skills, music expression, completeness, and degree of difficulty. To explore the changes in students' piano performance after using the blended lesson plan.

The researcher used a pretest and posttest to evaluate all students' piano-playing abilities and the scores of each item. The total score of the exam is 100 points, piano skills are 35%, music expression is 25%, completeness is 25%, and difficulty is 15%.

Table 1 evaluation criteria of Piano Performance

Variable(Definition)	Operationalization	Sources	Measurement
Piano skill/technique: refers to the musical categories developed for this piano performance skill evaluation scale included, tempo, rhythm, articulation, technique, Interpretation, dynamics, tone, pedaling, and memory. （Shin Young Kim，2000）	Piano performance test. Students were asked to perform music one by one on-site. The teachers immediately scored the students' piano performance according to the evaluation criteria.	Existing measurements use to measure the piano playing technique for all classes at the School of Music and Dance of Guangzhou University.	**Score:** Range from 0-100 Excellent =90-100 Good =80-89 medium =70-79 Poor=60-69 Fail=under 60
Music expression: the expression of musicians' inner feelings, subtle emotional processing, accompanied by good body language expression. (Hidehiro Nakahara et al., 2009)		Existing measurements use to measure the music expression for all classes at the School of Music and Dance of Guangzhou University.	
Completeness: There is no interruption in the whole performance process of the music. Performance should be evaluated as a whole. It is based on the transmission and understanding of musical works and piano skills (Johnson, P. 1997)		Existing measurements use to measure the completeness of all classes at the School of Music and Dance of Guangzhou University.	
Degree of difficulty: The difficulty of etudes usually represents the difficulty of piano works. (Aguer Alper, 2021) In general, Czerny 740, 299, and 599 represent China's primary, mediate, and advanced levels. (Zhang, 2009)		Existing measurements use to measure the degree of difficulty of music for all classes at the School of Music and Dance of Guangzhou University.	

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Questionnaire of self-efficacy level towards piano lesson

The 5-point Likert scale was used, ranging from 5=strongly agree to 1=strongly disagree(Sullivan and Artino, 2013). The questionnaire items were taken from the research of Kurtuldu and Bulut (2017). The questionnaire consists of two parts. The first part is the demographic information of participants, including gender, age, class, and other information. The second part collects the level of students' self-efficacy from two aspects: variable 1 refers to the self-efficacy of piano skill level, and variable 2 refers to the self-efficacy of piano-related knowledge and consciousness

In this study, we used an internal consistency test to analyze the reliability of the scale. The results show that Cronbach's Alpha of variable 1 is 0.966, and Cronbach's Alpha of variable 2 is 0.957, showing high internal consistency reliability. The summary results show that the internal coefficient is sufficient to collect actual data for the study. See the table below:

Table 2 Reliability of the scale

Variable	Number of Items	Cronbach's Alpha
The self-efficacy of the skill level of piano lessons	18	0.966
The Self efficacy of piano knowledge and consciousness level	14	0.957

In this study, we used exploratory factor analysis to explore the construct validity of the questionnaire. The prime analysis results showed that the KMO (Kaiser Meyer Olkin) coefficient of self-efficacy is 0.89, reaching a very good level, indicating that there are common factors among variables. Bartlett sphericity test χ The value of 2 was 2069.97 (df=496), P=0.00, and the construct validity of the scale was good. See the table below：

Table 3 Validity of the scale

	KMO coefficient	χ^2 value	df	P
Validity of the Questionnaire	0.89	2069.97	496	0.00

Descriptive statistics

The mean pretest and posttest self-efficacy of the experimental group increased from 2.14 to 3.51, and the corresponding arbitrary value means from "disagree" to "agree". Although the self-efficacy of the control group also increased, it only increased from "2.63" to "2.82", indicating that from "disagree" to "neutral", it is obvious that the level of self-efficacy of the experimental group has greatly improved. Comparing the mean value growth of variable 1 and variable 2 with the corresponding meaning of arbitrary value, the experimental group obviously has a significant growth compared with the control group.

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Table 4 Descriptive Statistics of Self-efficacy

Group	Pre-test			Post-test		
Experiment Group						
	Mean	SD	Interpretation	Mean	SD	Interpretation
Self-efficacy	2.14	.480	Disagree	3.51	.653	Agree
Variable1	2.17	.720	Disagree	3.57	.843	Agree
Variable2	2.09	.768	Disagree	3.48	.874	Agree
Control Group						
Self-efficacy	2.63	.571	Disagree	2.82	.618	Neutral
Variable1	2.69	.772	Neutral	2.87	.911	Neutral
Variable2	2.79	.768	Neutral	2.79	.792	Neutral

Descriptive Statistics of piano performance

It can be seen from Table 5 that the piano test scores of the experimental group have made great progress, with the mean rising from 78.0167 to 81.22, an increase of 3.2 points. Although the scores of the traditional control group have also made progress, from 77.83 to 79.02, the mean increasing only 1.19 points, the progress is small. From the analysis of the four variables of piano performance scores, the mean of piano skills of the experimental group has improved from 27.0967 to 29.2967, an increase of 2.2 points, only 0.8333 points higher in the control group.

In addition to the slight increase in the difficulty score in the control group compared with the experimental group, the progress of the experimental group is also greater than that in the control group in the musical expression and completeness of the experimental group.

It can be seen that blended learning has a greater positive effect on student's performance than the effect of traditional learning methods in the control group.

Table 5 Descriptive Statistics of piano performance

Variable	Group	Pre-test			Post-test			Mean comparison
		Mean	SD	Interpretation	Mean	SD	Interpretation	Difference value
Piano performance	Experiment Group	78.0167	.1.23151	Medium	81.22	.3.26131	Good	+3.2
	Control Group	77.8267	2.26273	Medium	79.0233	.618	Medium	+1.19
Piano skills	Experiment Group	27.0967	.1.10936	Medium	29.2967	2.26419	Good	+2.2
	Control Group	26.7067	1.22473	Medium	27.5400	2.59490	Medium	+.8333
music expression	Experiment Group	20.5100	1.23438	Good	21.0433	1.13978	Good	+.5333
	Control Group	20.0533	.97865	Good	. 20.2233	1.08174	Good	+.17
completeness	Experiment Group	19.1567	0.76324	Medium	19.5967	1.30370	Medium	+.44

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Variable	Group	Pre-test			Post-test			Mean comparison
		Mean	SD	Interpretation	Mean	SD	Interpretation	Difference value
Degree of difficulty	Control Group	19.5267	.96880	Medium	19.5533	1.04268	Medium	+.0266
	Experiment Group	11.2567	1.06761	Medium	11.3033	.94886	Medium	+.0466
	Control Group	11.4800	1.04268	Medium	11.7067	1.07573	Medium	+.2267

Hypotheses Testing

Paired sample t-test

This study used paired sample t-test to determine whether the students' self-efficacy improved after the intervention. It can be seen from the following table that the researchers conducted paired t-tests on the overall self-efficacy, variable 1, and variable 2 levels of students in the experimental group. The sig value (2-tailed) is<0.001, which means there is a significant difference. This shows that the self-efficacy of non-piano major music students has been greatly improved after receiving blended learning. However, the control group adopted the traditional teaching method, and the sig values of the pre-test and post-test paired t-test results were 0.294, 0.301, and 0.301. There was no significant difference, and the level of students' self-efficacy did not change significantly.

Table 6 self-efficacy paired sample t-test

No	Pair T-test 1-experiment group 2- control group	N	Mean	Mean value of standard error	Difference (95% confidence interval)		SD	t	Df	P-value (2-tailed)
					Lower limits	Upper limits				
Pair 1	post1 - pre1	30	1.37396	0.13727	1.09321	1.65471	0.75186	10.009	29	**<0.001**
Pair 2	post1v1 pre1v1	30	1.35000	0.14022	1.06322	1.63678	0.76802	9.628	29	**<0.001**
Pair 3	post1v2-pre1v2	30	1.40476	0.14172	1.11492	1.69461	0.77622	9.912	29	**<0.001**
Pair 4	post2 - pre2	30	0.18958	0.17728	0.17299	0.55216	0.97099	1.069	29	0.294
Pair 5	post2v1-pre2v1	30	0.19815	0.18808	0.18652	0.58282	1.03016	1.054	29	0.301
Pair 6	post2v2-pre2v2	30	0.178571	0.16975	0.16860	0.52575	0.929755	1.052	29	0.301

This study used paired sample t-test to determine whether the piano playing of students improved after the intervention.

Paired t-tests were conducted on the scores of piano performances and all variables in the experimental group.

Among them, the sig values (2-tailed) of the piano test and piano technique level are all<0.001, which means that there is a significant difference. It shows that experiment students have greatly improved their piano performance and piano technique after receiving blended learning, but their other

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aspects are no significant difference， the sig values (2-tailed) are 0.056, 0.085, and 0.741, respectively, indicating that blended learning has no significant impact on the musical expression, completeness, and difficulty of piano playing.

The researcher also conducted the same paired t-test in the control group, the piano test scores and the piano technical level sig values (2-tailed) were 0.009 and 0.025, that is, there was a significant difference, indicating that the traditional teaching method also had an effect on the improvement of students' piano performance scores and piano skills, but the effect of blended learning was more obvious, more significant.

However, the sig values of the paired t-test results of expression and completeness of piano playing are 0.072 and 0.846 respectively, showing no significant difference, indicating that traditional learning methods have no significant impact on students' expressiveness and integrity of piano playing. However, the pre- and post-paired t-test results of the variable "degree of difficulty" in the control group found that its sig value (2-tailed) was 0.022, with a significant difference, indicating that students under the traditional learning mode may be more inclined to choose more difficult tracks to play in the exam.

Table 7 Paired sample t-test of piano performance

No	Pair t-test	N	Mean	Mean value of standard error	Difference (95% confidence interval)		SD	t	Do	P(2-tailed)
					Lower limits	Upper limits				
Pair 1	Post-test1-pretest1	30	3.20333	2.85820	0.52183	4.27060	2.13606	6.139	29	**<0.001**
Pair 2	Post-skill1-preskill1	30	2.20000	2.00637	0.36631	2.94919	1.45081	6.006	29	**<0.001**
Pair 3	Post-expression1 pre-expression1	30	0.53333	1.46554	0.26757	1.08058	0.01391	1.993	29	0.056
Pair 4	Postcompleteness1-pre-completeness1	30	0.44000	1.35331	0.24708	0.94533	0.06533	1.781	29	0.085
Pair 5	predifficulty1 - postdifficulty1	30	0.04667	0.76552	0.13976	0.33252	0.23918	0.334	29	0.741
Pair 6	posttest2-pretest2	30	1.19667	2.33216	0.42579	2.06751	0.32583	2.810	29	**0.009**
Pair 7	Post-skill2-preskill2	30	0.83333	1.92682	0.35179	1.55282	0.11385	2.369	29	0.025
Pair 8	Post-expression2-Pre-expression2	30	0.17000	0.49838	0.09099	0.35610	0.01610	1.868	29	0.072
Pair 9	Post-compleness2-Pre-compleness2	30	0.02667	0.74321	0.13569	0.30419	0.25085	0.197	29	0.846
Pair 10	prodifficlulty2-predifficulty2 -	30	0.22667	0.51457	0.09395	0.41881	0.03452	2.413	29	0.022

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Correlation analysis

In this study, Pearson correlation analysis was used to evaluate the relationship between post-test self-efficacy and piano performance of all samples. The results showed that there was a significant positive correlation between the two variables. (r=0.363, P=0.049), indicating that students' self-efficacy has a relatively positive impact on piano performance, and the two are related.

Table：8 *correlation analysis*

		Post-self-efficacy	posttest
Post-self-efficacy	Pearson correlation	1	.383**
	P(2-tailed)		**0.003**
	N	60	60
Post-test		.383**	1
		0.003	
		60	60

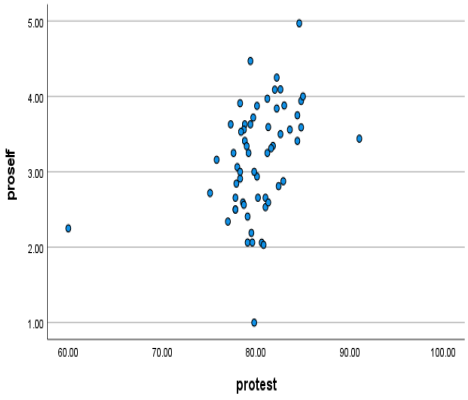

Figure:2 *correlation figure*

Summary of Hypothesis testing and results

Hypotheses	Hypothesis testing	Result after Analysis
Ha1:	Accept	t=10.009，P（Sig.（2-tailed））=0.000 <0.05
Ha2:	Accept	t=6.139，P（Sig.（2-tailed））=0.000 <0.05
Ha2a:	Accept	t=6.006，P（Sig.（2-tailed））=0.000 <0.05
Ha2b:	reject	t=1.993，P（Sig.（2-tailed））=0.056 >0.05
Ha2c:	reject	t=3.28，P（Sig.（2-tailed））=0.085 >0.05
Ha2d:	reject	t=0.334，P（Sig.（2-tailed））=0.741>0.05
Ha3:	Accept	r=0.363，P（Sig.（2-tailed））=0.003<0.05

Discussion

First, answer the first research objective. From the previous hypotheses testing, it can be seen that after receiving blended learning, non-piano major music college students have significant differences in sig values before and after "piano performance" and "piano technique" score, but there is no significant difference in "music expression ", "completeness", and "degree of difficulty", indicating that blended learning has a very significant positive effect on the overall performance of piano playing and piano technique, however, it has no obvious positive impact on the musical expression, completeness, and degree of difficulty.

The traditional teaching method in the control group also has an effect on the improvement of students' piano performance and piano skills, but the effect of blended learning is more obvious.

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This research experiment is consistent with most of the research results. For example, the teaching experiment results conducted by Katsuko T. et, al (2011), showed that blended teaching significantly improves students' performance skills, which verifies previous research on the positive impact of blended teaching of piano group lessons on piano students' performance.

Answer the second research objective, from the previous hypothesis test, it can be seen that the self-efficacy of students in the experimental group has been greatly improved after receiving blended learning, and blended learning has a very significant positive effect on the self-efficacy of students. While the control group used traditional teaching methods, the level of students' self-efficacy did not change much.

This study confirms previous studies on the positive effect of blended learning on self-efficacy, such as the study of Desi Puspitasari (2021), which confirmed that the application of blended learning can improve learners' self-efficacy.

This also shows that it is possible to improve students' learning self-efficacy in piano courses by using blended teaching methods in future teaching.

As the third research objective, many studies have proved that self-efficacy is positively related to piano performance. For example, Hatice & Doruk (2017) said that if a person has a high sense of self-efficacy, he will actually perform well in piano playing. Through our research, we found that there was a significant positive correlation between self-efficacy with their piano performance of non-piano major music students at Guangzhou University, indicating that students' self-efficacy had a positive impact on their piano performance, and the two had a significant correlation. The improvement of blended teaching self-efficacy helped students establish better confidence and sense of purpose in learning, It helps to promote the progress of performance.

Recommendations

In general, the results of this experimental study found that under the guidance of BOPPPS theory, the blended piano group lesson based on the 91suke platform had a significant effect on the self-efficacy and piano performance of non-piano major students. There was a significant positive correlation between the sense of self-efficacy and the students' piano performance.

At the same time, through research experiments and statistical analysis, we have obtained some unexpected findings. For example, The training of music expression may require more effective training methods to achieve a better learning effect. Besides the sense of self-efficacy, we also deserve to pay more attention to and observe other factors that affect students' piano performance. Teachers should pay more attention to the existence of tacit knowledge in teaching. Finally, based on the current research experiments, the author believes that we must also know more about the technical platforms and software, explore and develop the piano group lesson technical software that is more suitable for students' preferences, convenient to use, and richer functions. In future research, we should further expand the number of samples and the time for experiments, and we can adopt a mixed method of quantitative and qualitative methods for future research, The teaching plan of the blended piano group lesson proves that it is effective to improve students' piano performance. We should strengthen the

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scope and depth of its intervention, and continuously explore, evaluate and revise more effective teaching intervention strategies.

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