

INFLUENCE OF MIXED TEACHING MODE ON THE LEARNING OUTCOMES TO UNDERGRADUATE PIANO COURSES AT YUNNAN TECHNOLOGY AND BUSINESS UNIVERSITY, CHINA

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ABSTRACT

The objectives of this study were 1) to explore the influence of mixed teaching on the learning effect, 2) to improve the teaching quality of undergraduate piano courses, 3) to provide reference basis and improvement strategies for universities to improve and promote mixed teaching. The research methodology was quantitative research. The conceptual framework of this research was applied from constructivism theory of Xi Yuan's study. The population consisted of 450 students who enrolled in undergraduate piano course at Yunnan Technology and Business University, China. The samples of 207 students were determined by Krejcie and Morgan table. The instruments used in this research was a 5-rating questionnaire. The statistics used for data analysis were percent, mean, standard deviation, and t-test. The study results revealed that 1) the influence of mixed teaching on the learning effect, the overall the teaching quality of undergraduate piano courses was at a much level. 2) Students' learning characteristics, teachers' teaching factors and learning platform factors have a positive influence effect on the learning effect of undergraduates. 3) The high level of interactive behavior, self-regulation and psychological preparation in the mixed teaching mode, partly reflects the good fitness of undergraduates in the mixed teaching. In addition, undergraduates showed evaluation of teachers' mixed teaching ability and learning platform at the high level.

Keywords: Mixed Teaching, Undergraduate, Learning Effect, Teacher Teaching, Learning Platform

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INTRODUCTION

"Hybrid teaching" pursues to give full play to the advantages of the above two teaching modes and combine face-to-face classroom teaching (Face to Face) with online teaching (E-learning), which not only reflects the basic characteristics of the educational information age, but also faces up to the traditional origin of learning. Hybrid teaching using modern information technology, build the teaching environment of the actual integration, break the classroom knowledge transfer, knowledge internalization, knowledge consolidation order, redesign the teaching arrangement before class, class, after class, not only give students more freedom, but also conducive to more efficient use of classroom time for learning experience exchange and ideas of collision to deepen the students' cognition (Wang Qing, 2021). In recent years, the New Media Alliance (NMC) in the United States has emphasized the importance of hybrid teaching and its application trends in higher education in the Horizon Report (Horizon Report) (The New Media Consortium report: 2017 higher education edition, 2017.), scholars at home and abroad have carried out a large number of theoretical and empirical research on mixed teaching, and a considerable number of documents have expressed the recognition of mixed teaching. Since 2019, the continued impact of COVID-19 has also promoted the development and application scope of hybrid teaching, and it has gradually become a long-term sustainable teaching mode in college teaching. At the practical level, many relevant documents issued by China also require and encourage schools to actively carry out the practice of mixed teaching, and more and more colleges and universities adopt the mixed teaching mode in the subject teaching. In 2020, the Ministry of Education announced the first batch of first-class undergraduate courses, totaling 5,118 courses, including 868 hybrid first-class courses. The Ministry of Education has launched the first batch of national first-class undergraduate courses. The importance of the study is reflected in deepening the understanding of the impact of different teaching methods on students' learning. If the blended teaching model proves to positively affect the effectiveness of undergraduate piano courses, this will provide strong support for educators to promote the wider adoption of this teaching approach. This also helps to improve the flexibility of the educational system to better meet the diverse learning needs of students.

Research objectives

- 1) To explore the influence of mixed teaching on the learning effect.
- 2) To improve the teaching quality of undergraduate piano courses.
- 3) To provide reference basis and improvement strategies for universities to improve and promote mixed teaching.

LITERATURE REVIEWS

Learning platform factors refer to the various internal and external conditions that affect the effects of online learning or distance education. These factors include but are not limited to curriculum design, teaching methods, technical facilities, teacher quality, student participation, etc. Understanding these factors is essential to improving the effectiveness and efficiency of the learning platform.

- 1) Curriculum design: Curriculum design is the core of the learning platform, which determines the content and way of learning. A good curriculum design should include clear learning objectives, appropriate learning resources, effective teaching strategies, and evaluation mechanisms.
- 2) Teaching method: Teaching method is the means to achieve the curriculum objectives, which affects the effect and efficiency of learning. Both the traditional face-to-face teaching methods and the modern online teaching methods have their own advantages and limitations.
- 3) Technical facilities: Technical facilities are the hardware and software that support online learning, including computer, network, multimedia equipment, learning management system,

etc. The quality and stability of the technical facilities have a great impact on the learning effect.

4) Teacher quality: Teachers are the leaders in the learning process, and their teaching ability, professional knowledge and teaching attitude have a direct impact on students' learning effect.

5) Student participation: Students' participation is an important indicator to evaluate the learning effect, which reflects students' enthusiasm and initiative in learning. High participation can enhance the effectiveness and satisfaction of learning.

These factors affect each other and together constitute the overall environment of the learning platform. Understanding and mastering the theory and practice of these factors can help us to design and optimize the learning platform to improve the quality and efficiency of learning.

Teachers' teaching factors are the key elements that affect the quality of education and students' learning results. These factors include teacher knowledge, skills, attitudes, values, and how they behave and interact in the classroom. In the field of pedagogy, there are many theories and models to explain the role of teacher teaching factors. The following are the theories and models of some major teacher teaching factors:

1) Teacher's knowledge theory: This theory focuses on the knowledge structure of teachers, and believes that teachers' professional knowledge, subject knowledge and teaching knowledge are the key factors affecting the teaching effect. Teachers need to master rich knowledge and information, in order to effectively organize and transfer the teaching content, and help students to understand and master the knowledge.

2) Teachers' belief theory: This theory emphasizes the influence of teachers' beliefs and ideas on teaching. Teacher beliefs include views of the subject, students, teaching methods, and educational objectives. These beliefs can affect teachers' teaching choices and behaviors, and thus affect students' learning outcomes.

3) Teacher's efficacy theory: This theory focuses on teachers' confidence in their own abilities, and believes that teachers' efficacy will directly affect their teaching behavior and students' learning results. Teachers with high efficiency are more likely to adopt active teaching strategies to stimulate students' learning interest and motivation.

4) Teachers' emotional input theory: This theory holds that teachers' emotional input is an important factor affecting the teaching effect. Teachers' love for subjects, students and education, as well as their care and support for students, will stimulate students' positive learning attitude and behavior.

5) Theory of teacher behavior pattern: This theory focuses on teachers' teaching behavior in the classroom, such as questioning, feedback, explaining and organizing activities. These behavior patterns can affect students' learning process and learning outcomes, so teachers need to have effective teaching behavior skills.

6) Social and cultural theory: This theory emphasizes the interaction between teachers and students in the classroom and the influence of social and cultural background on teaching. Teachers need to pay attention to students' needs and characteristics in classroom teaching, while respecting and adapting to students' cultural background.

7) Reflecting on practical theory: This theory advocates that teachers can constantly improve their teaching ability and effect by reflecting on their own teaching practice. Teachers need to pay attention to their own teaching process and results, analyze the causes of problems, and formulate improvement measures so as to achieve sustained professional development.

In short, teachers' teaching factors are various, involving knowledge, skills, attitude, values and other aspects. Understanding and mastering these theories and models can help teachers to better design and implement the teaching, improve the teaching quality, and promote the all-round development of students.

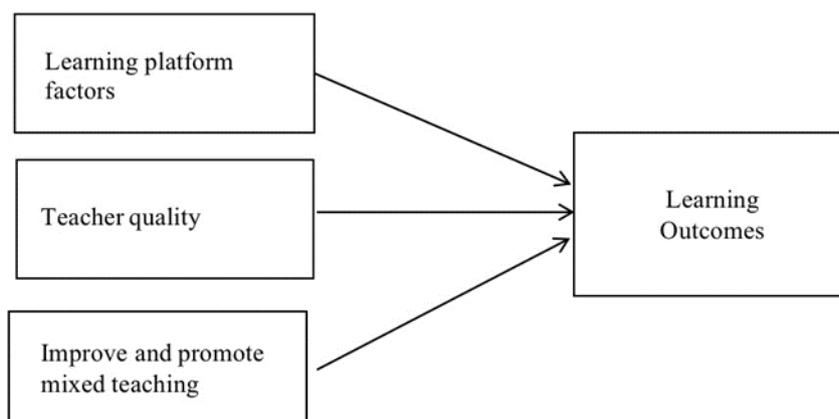


Figure 1 Conceptual Framework

RESEARCH METHODOLOGY

The population and Sample Group

During the experimental phase, the authors distributed 450 questionnaires to universities in Chongqing, with a recovery rate of 450 and a recovery rate of 100%. After screening the invalid questionnaires with too short answer time and too high answer repetition rate, 394 valid questionnaires were obtained, with an effective rate of 87.5%.

Research Instruments

1) Bibliometric is a quantitative analysis method, taking the external characteristics of the literature as the research object, and using mathematical and statistical methods to describe, evaluate and predict the current situation and development trend of scientific research in a certain field. Citespace Is a citation visual analysis software developed in the context of scientific econometrics (Scientometric), which can be used to analyze the potential knowledge contained in the scientific literature.[2] This study in the early stage by collecting mixed teaching, learning effect of related literature, using citespace software analysis of the research situation of the two fields, and the important literature point of view, induction and summary, fully grasp the scholars of the research topic, combing development, clear related concepts, lay the foundation for subsequent research.

2) Questionnaire method is one of the important survey methods in social science research, and it is usually used in descriptive, explanatory and exploratory research. In this study, the main purpose of the questionnaire survey is to collect data through students' self-report, study the learning experience and learning effect of current undergraduates in mixed teaching, explore the influence effect of learning characteristics, teacher factors and platform factors on undergraduate learning effect and the influence mechanism of learning effect. Although this method is a conventional research method in the current social science, it has some limitations and is not as attractive as the experimental method in the field of natural science, but it is difficult to apply the experimental method to the research of social science. The questionnaire in this study was mainly distributed online and supplemented by offline distribution, with two rounds of data collection, pre-survey and formal questionnaire survey successively.

3) Interview method is a research communication activity that collects and constructs research data from the interviewees through language communication.[4] The interview method helps to break the limitations of the researchers themselves and provide multiple perspectives for the research. In this study, the interview method as an auxiliary research method, through the interview of undergraduates, further study the undergraduate learning experience in the mixed teaching mode, explore the influence of the mixed teaching elements on the undergraduate learning effect, focus on the undergraduate good / bad learning effect, according to the inductive data of interview analysis, to improve the questionnaire and make up the research of

the questionnaire. According to the research needs, 3 undergraduates were interviewed in this study, and the basic information of the interviewees.

Data Collection

- 1) Data related to the learning platform
- 2) Data related to the teacher's teaching factors
- 3) Data related to the learning characteristics of the undergraduates

Data Analysis

On the basis of reading a large number of literature, we construct a research framework for undergraduate learning effect under the hybrid teaching model of teaching, named "LTL-P-O" model. Under the guidance of this theoretical model, a set of questionnaires with good reliability and validity was prepared after interview, preliminary questionnaire, trial test and modification, and made statistical analysis by SPSS26.0 and AMOS23.0.

RESEARCH RESULTS

Table 1 Academic performance and undergraduate learning effect

Dimension	outstanding	above the average	Medium	below the average	F	P
Cognitive harvest	3.85 ± 0.33	4.02 ± 0.67	3.69 ± 0.54	3.60 ± 0.63	7.41	0.00
Skills harvest	3.87 ± 0.53	3.76 ± 0.62	3.76 ± 0.62	3.52 ± 0.81	4.98	0.00
Emotional harvest	3.75 ± 0.40	3.95 ± 0.69	3.76 ± 0.55	3.33 ± 0.77	8.21	0.00
Digital literacy	3.84 ± 0.44	4.09 ± 0.63	3.78 ± 0.66	3.63 ± 0.43	7.78	0.00
To achieve the goal	3.85 ± 0.38	4.06 ± 0.61	3.86 ± 0.62	3.49 ± 0.76	7.22	0.00
Teaching facilities process	3.78 ± 0.34	3.85 ± 0.68	3.84 ± 0.57	3.41 ± 0.82	7.09	0.00
Teaching conditions	3.82 ± 0.31	4.04 ± 0.71	3.83 ± 0.59	3.34 ± 0.82	9.59	0.00
Online learning anxiety	2.99 ± 0.72	2.88 ± 1.02	3.21 ± 0.85	3.21 ± 0.73	2.43	0.05
Offline learning anxiety	1.94 ± 0.70	2.79 ± 1.08	3.07 ± 0.84	2.84 ± 1.02	1.67	0.16
Mixed learning anxiety	1.64 ± 0.83	2.61 ± 1.11	2.88 ± 0.99	2.87 ± 1.18	1.25	0.29
behavior disposition	3.05 ± 0.70	4.10 ± 0.68	3.73 ± 0.72	3.40 ± 1.06	9.74	0.00

The table presents data across various dimensions related to experiential learning outcomes, including cognitive harvest, skills harvest, emotional development, and learning anxiety, among others. A detailed analysis of these dimensions highlights several key trends and insights.

Cognitive Harvest: The data shows that students who were categorized as "above the average" achieved the highest cognitive gains, with a mean of 4.02. This group benefitted more from the experiential teaching method compared to the other categories, as indicated by the significant F-value of 7.41 and p-value of 0.00. The results suggest that students who were already performing relatively well before the intervention were able to leverage the active learning opportunities provided by experiential learning to achieve even better outcomes.

Skills Harvest: The data shows that experiential learning had a positive impact on students' skill development across all performance categories. The "outstanding" group had the highest mean (3.87), while the "medium" and "above the average" groups had equal scores of 3.76. With an F-value of 4.98 and a p-value of 0.00, the statistical significance shows that experiential learning is an effective method for enhancing practical skills, especially for high-performing students.

Emotional Harvest: The emotional engagement of students also saw significant improvement, especially in the "above the average" group, which recorded a mean score of 3.95. The F-value of 8.21 and p-value of 0.00 indicate that the emotional connection and engagement fostered by experiential learning positively influenced students. This shows that active participation in

learning enhances not only cognitive and practical outcomes but also emotional investment in the learning process.

Digital Literacy: In terms of digital literacy, the "above the average" group again showed the highest mean score of 4.09, and the differences between groups were significant ($F = 7.78$, $p = 0.00$). This suggests that students who are more proficient tend to benefit more from the digital components of experiential learning, enhancing their technological competence.

Achievement of Goals: The "above the average" group demonstrated the highest mean score (4.06) in terms of achieving the learning goals. The significant F-value of 7.22 and p-value of 0.00 indicate that the experiential teaching method significantly contributed to helping students meet or exceed the course objectives, particularly those with higher initial performance. This suggests that the experiential method supports goal-oriented learning effectively, particularly for those who already have a strong foundation.

Teaching Facilities and Conditions: Students' perceptions of teaching facilities and conditions were also significantly higher among those who performed "above the average." This group scored 4.04 in teaching conditions and 3.85 in teaching facilities, with significant F-values of 9.59 and 7.09 (both p-values = 0.00). This suggests that students with better performance also tend to have a more positive view of the resources and conditions available for learning, possibly because they are better equipped to make full use of those resources.

Learning Anxiety: The analysis shows some differences in learning anxiety, particularly for online learning anxiety, which was higher in the "medium" group (mean 3.21) compared to the others. Although this difference is only marginally significant ($F = 2.43$, $p = 0.05$), it suggests that average-performing students experience higher levels of anxiety during online learning, likely due to challenges in adapting to the digital learning environment. Interestingly, offline and mixed learning anxiety did not show significant differences between the groups, with p-values of 0.16 and 0.29, respectively. This suggests that these types of learning do not cause significant variations in anxiety across performance levels, possibly because they are more familiar or structured environments.

Behavior Disposition: A significant difference was observed in behavior disposition, with the above the average group scoring the highest (4.10). The F-value of 9.74 and p-value of 0.00 demonstrate that the Experiential Teaching Method has a significant impact on students' behavior, encouraging active participation and positive attitudes toward learning, particularly in higher-performing students.

Higher-performing students ("above the average") consistently scored the highest across cognitive, skills, emotional, and behavioral dimensions. This indicates that experiential learning is particularly beneficial for students with a solid foundation, allowing them to further enhance their abilities.

Digital literacy and goal achievement are areas where experiential learning had a strong impact, especially on students who were already proficient, suggesting that experiential methods effectively support higher-level skills and learning objectives.

Learning anxiety, particularly in online settings, was more pronounced among average performers, which highlights the need for targeted support for these students in digital learning environments.

The behavioral disposition data suggests that experiential learning not only helps students academically but also improves their attitude and engagement in the learning process.

Experiential learning demonstrates clear benefits across multiple dimensions, including cognitive development, skill acquisition, emotional engagement, and behavior. The results confirm that students with higher initial performance tend to benefit most, achieving both academic and emotional gains. The findings also emphasize the importance of addressing online learning anxiety, particularly for average-performing students, to ensure a more inclusive and supportive learning environment for all learners. Overall, experiential learning

proves to be an effective pedagogical strategy for fostering well-rounded student development in academic and practical domains.

DISCUSSION & CONCLUSION

The objectives of this study were to explore the influence of mixed teaching (a combination of online and offline methods) on the learning effect, improve the teaching quality of undergraduate piano courses, and provide strategies for universities to enhance mixed teaching. Based on the findings, several key insights emerge regarding the effectiveness of mixed teaching in the context of undergraduate piano instruction.

Influence of Mixed Teaching on Learning Effect:

The study reveals that mixed teaching has a significant positive impact on students' learning outcomes. By blending traditional in-class instruction with online learning resources, students were able to engage more deeply with the course material. The flexibility of the online component allowed students to review lessons at their own pace, while the face-to-face instruction ensured that practical skills and techniques were honed through direct teacher-student interaction. This balance between structured guidance and autonomous learning appears to enhance students' overall comprehension and application of piano techniques. The findings suggest that mixed teaching offers a holistic approach that caters to diverse learning preferences and promotes better learning retention.

Improvement of Teaching Quality in Piano Courses:

The integration of mixed teaching methods in undergraduate piano courses resulted in a notable improvement in teaching quality. The study found that students benefited from the interactive elements of online learning, such as video tutorials, digital assessments, and virtual feedback, which complemented the hands-on instruction they received in the classroom. Moreover, the ability to access additional resources outside of class time enabled students to practice more effectively, thereby improving their performance in practical exams. The dual mode of instruction also allowed teachers to customize learning paths, addressing individual student needs more efficiently. As a result, students reported greater satisfaction with the teaching process, citing improvements in both their technical skills and musical expression.

Strategies for Improving Mixed Teaching in Universities:

The study underscores the need for universities to implement comprehensive strategies to optimize mixed teaching. Key recommendations include enhancing digital infrastructure to support seamless access to online resources, ensuring that students can benefit from high-quality video tutorials, interactive modules, and real-time feedback systems.

Providing professional development for instructors to better integrate digital tools with traditional teaching methods. This will help instructors design lessons that effectively balance theoretical knowledge and practical skill development.

Encouraging continuous feedback mechanisms where both students and teachers can assess the effectiveness of the mixed teaching approach and make necessary adjustments to improve the learning experience.

By adopting these strategies, universities can foster a more engaging and efficient learning environment that not only improves student outcomes but also elevates the overall standard of piano education.

Conclusion

In conclusion, the study demonstrates that mixed teaching is a highly effective approach to improving the learning effect and teaching quality in undergraduate piano courses. The blend of online and offline methods allows for greater flexibility, personalization, and engagement, making it easier for students to master both theoretical and practical aspects of piano performance. The study also highlights the importance of institutional support in implementing

and refining mixed teaching methods, ensuring that universities have the necessary infrastructure and instructional resources to maximize the benefits of this teaching approach. By leveraging the insights gained from this study, universities can develop targeted improvement strategies to enhance their mixed teaching practices, ultimately leading to better educational outcomes for students. With proper implementation and ongoing refinement, mixed teaching has the potential to revolutionize music education, providing students with a richer, more dynamic learning experience that prepares them for success in both academic and professional settings.

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