Music learning platform, teaching strategies, and student engagement in one Chinese university

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Abstract

This study utilized a descriptive research design to investigate the effects of a music learning platform on student engagement at Zhengzhou Business College, focusing on the influence of instructional strategies. A questionnaire was designed and distributed to gather extensive data on student interactions with the platform, including frequency, duration, and number of interactions. The data were analyzed using SPSS 17.0 to examine correlations between platform functions, teaching strategies, and student engagement. The study was grounded in educational technology literature, music education theories, and online learning platform research, ensuring a solid theoretical base. Research ethics were strictly followed to protect participant privacy and ensure data were used solely for the study's purposes. In this study, 2000 teachers and students of Zhengzhou Business School were selected to study the music learning platform, teaching strategies and student engagement through questionnaires. The sample of the study consisted of 405 research respondents selected at random. Through content analysis, teacher interviews and observations of e-learning platform usage, the researcher aimed to gain insights into the school's practical experience in the field of music education and how innovative teaching strategies can improve student engagement and learning outcomes. The purpose of this study was to assess the music learning platform, teaching strategies, and student engagement at a Chinese university. More specifically, the study sought to describe the profile of the respondents in terms of age, sex, major, grade or school year; identify multimedia learning platforms in terms of user experience and personalization, learning effectiveness and efficiency, motivation and attitude to learning, and recommendations and satisfaction; assess teaching strategies from the individual and methodological dimensions of music teaching, the dimensions of lesson planning and instructional design, the dimensions of educational context and environment, and the dimensions of individual differences and actual conditions, had been the objective; observed student engagement in terms of the dimensions of subject content experience and pedagogy, classroom environment and management, motivation and individual differences, and behavioral and psychological aspects of student engagement in learning; test the difference of

music learning platform, teaching strategies and student engagement when grouped according to profile variables; test the relationship among music learning platform, teaching strategies and student engagement ; and propose teaching improvement plan and music learning platform recommendation based on the results of the study. The majority of the respondents were young males, between the ages of 19 and 25, majoring in education and belong to the freshman class. Respondents felt that student engagement was significantly impacted in Motivation and Individual Differences. Among the Respondent grouped by grade level, freshmen significantly outperformed the other groups on the assessment. There exists an important relationship between music learning platforms, instructional strategies, and student engagement. The teaching improvement program Music Syllabus, Teaching Strategies, and Student Management in Chinese Colleges and Universities was proposed.

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1. Introduction

In the current digital era, the field of education has also begun to gradually adopt information technology to support the teaching and learning process. A typical example is the music learning platform in Chinese universities, which provides a place for students and teachers to learn and teach online.

The construction and development of platforms have always relied on the solid support of information technology. Lai, et. al., (2021), in his study, provides an in-depth analysis of the evolution of platforms, revealing how platforms are gradually shaped into today's rich and varied functional characteristics through continuous improvement and optimization. Of particular interest is that such platforms not only build a convenient online learning environment for users, but also promote real-time and efficient interaction between students and teachers, thus greatly enhancing the flexibility and convenience of learning. Focusing on the segment of music learning platforms, researchers can see how information technology has revolutionized music education. The traditional music learning mode is often limited by time, place and resources, but the emergence of music learning platforms has completely broken these constraints. The service targets of the platform mainly include students, teachers and off-campus users. By analyzing the characteristics of these users, it is possible to understand the needs and characteristics of different types of users, and then provide them with more precise and personalized services.

At the same time, Black (2018) argues that the platform's operating model also needs to consider aspects such as the management system, technical support and business model to ensure the platform's sustainable development and user satisfaction. Meanwhile, teaching strategies are also one of the key factors influencing the music learning platform. Whiley, et. al., (2018) argued that by setting clear teaching objectives and course content, students can be provided with targeted learning content and their learning outcomes can be assessed. The choice of teaching tools and methods also plays an important role. Different teaching tools and methods can stimulate students' interest and motivation in learning and improve teaching effectiveness. Student engagement is one of the key indicators to measure the effectiveness of platform usage. Gibbons (2023) argues that through the collection and analysis of quantitative indicators, it is possible to understand how active and engaged students are on the platform. At the same time, factors affecting student engagement, such as motivation, learning environment, and course design, should also be considered so that corresponding improvement measures and suggestions can be made.

The significance of this study is to conduct a comprehensive research and analysis of music learning platforms, teaching strategies and student engagement in Chinese universities. Firstly, Garner, et. al., (2019) argue that understanding the construction and development history of the university's music learning platform can provide lessons and references for other schools or institutions. By analyzing the current status and functionality of the platform, the effectiveness and satisfaction of its use can be assessed, providing guidance for its improvement and upgrading. Secondly, Ataş, et. al.,(2018) showed that analyzing the characteristics of the platform's service recipients (i.e. students, teachers and external users) can help to design learning resources and teaching activities accordingly to the needs of different groups.

In particular, the analysis of student user characteristics helps to propose personalized teaching strategies for students of different levels and abilities. In addition, Song, et. al., (2022) study shows that by analyzing teachers' user characteristics, targeted training and support can be provided to teachers to improve their teaching ability and effectiveness. Again, by analyzing the platform's operation model, including the management system, technical support and business model, it can provide relevant experience and reference for other universities or

institutions. The analysis of teaching strategies is the focus and key of this study.

The formulation and sorting out of teaching objectives and curriculum content can ensure that the teaching process has clear objectives and content, and help students better understand and master musical knowledge and skills. The selection and design of teaching means and methods can provide diversified learning pathways and teaching experiences to stimulate students' interest in learning and their sense of participation. Teaching effectiveness analysis is an important basis for evaluating the effectiveness of teaching strategies and platform usage. Through the analysis of learning achievement and learning satisfaction survey, we can understand the teaching effect and students' feedback on teaching strategies, which provides the basis for further improvement of teaching.

Hou, et. al., (2023) argues that student engagement is another focus of this study, and examining its quantitative indicators and influencing factors can provide relevant strategies and recommendations for improving student engagement. Analyzing the relationship between engagement and academic performance can help to explore the impact of engagement on academic performance and provide guidance for improving academic performance. Finally, the empirical study summarizes the cases and provides insights and suggestions for the construction of music learning platforms and the improvement of teaching strategies in other colleges and universities or institutions, so as to promote the quality of music education.

The reason why this study chose to conduct an in-depth discussion from the three perspectives of music learning platform, teaching strategy and student participation is because the music learning platform, as a new position of music education under the conditions of modern technology, is becoming more and more significant in its function and influence; while the use of teaching strategy is directly related to the realization of the teaching effect, which is especially critical for platform education; student participation is an important indicator of the quality of education, and a core driving force for the sustainable development of music education. Student participation is an important indicator of education quality and a core driving force for the sustainable development of music education. By synthesizing these three aspects, the researcher expects to provide comprehensive and in-depth insights into the research and practice of music education, and thus promote the innovation and improvement of music education.

Objective of the Study - The purpose of this study was to assess the music learning platform, teaching strategies, and student engagement at a Chinese university. More specifically, the study sought to describe the profile of the respondents in terms of age, sex, major, grade or school year; identify multimedia learning platforms in terms of user experience and personalization, learning effectiveness and efficiency, motivation and attitude to learning, and recommendations and satisfaction; assess teaching strategies from the individual and methodological dimensions of music teaching, the dimensions of lesson planning and instructional design, the dimensions of educational context and environment, and the dimensions of individual differences and actual conditions, had been the objective; observed student engagement in terms of the dimensions of subject content experience and pedagogy, classroom environment and management, motivation and individual differences, and behavioral and psychological aspects of student engagement in learning; test the difference of music learning platform, teaching strategies and student engagement when grouped according to profile variables; test the relationship among music learning platform, teaching strategies and student engagement ; and propose teaching improvement plan and music learning platform recommendation based on the results of the study.

2. Methods

Research Design - This study utilized a descriptive research design to investigate the effects of a music learning platform on student engagement at Zhengzhou Business College, focusing on the influence of instructional strategies. According to Huang (2021), quantitative analysis enabled a more precise understanding of these relationships, contributing to the improvement of the music learning environment and student engagement. The study was grounded in educational technology literature, music education theories, and online

learning platform research, ensuring a solid theoretical base. Research ethics were strictly followed to protect participant privacy and ensure data were used solely for the study's purposes.

Participants of the Study - In this study, 2000 teachers and students of Zhengzhou Business School were selected to study the music learning platform, teaching strategies and student engagement through questionnaires. The respondents of the study consisted of 425 teachers based on an effect size of 0.22, a power probability of 0.95 and an alpha level of 0.05 using G*Power 3.1.2. In selecting respondents for this study, certain selection criteria were strictly followed. Teachers chosen were primarily those who were actively involved in music teaching and possessed extensive teaching experience, guaranteeing an in-depth comprehension and hands-on knowledge of music learning methods and student participation. Students from various grades, majors, and musical backgrounds were carefully selected to maintain a diverse and representative sample. As for the sampling strategy, stratified random sampling was utilized. Initially, the entire population was segmented into two strata: teachers and students. Random sampling was then performed within each stratum, ensuring both the diversity of the sample and the dependability of the research. Consequently, 425 teachers and their corresponding students were carefully chosen as study participants.

Instrument of the Study - A four-part questionnaire was used in this study. The first part was on soliciting Personal Information, containing age, sex, major, grade or academic year. The second part is adapted from Research on User Retention Mechanisms of Online Learning Platforms. A scenario of e-learning platform for PhD students based on the separation of roles of secondary school students and parents, containing four dimensions of questionnaires, the first one being Personal Information, which contains four dimensions, including age, gender, major, 4. grade or academic year. Journal Publication Information (2023) multidimensional questionnaire containing four dimensions: User Experience and Personalization, Effectiveness and Efficiency. learning effectiveness and efficiency, motivation and attitude, recommendation and satisfaction to determine the music learning platforms. The third section, Teaching Strategies, was adapted from The Multi-Dimensional Questionnaire for Teachers' Instructional Strategies Research, which contains the Teaching Strategies, Teaching Methods Dimension, Lesson Planning and Instructional Design Dimension, and Instructional Design Dimension. Music Teaching and Methods Dimension, Lesson Planning and Instructional Design Dimension, and Educational Background and Environment Dimension.

Individual Differences and Practical Conditions Dimension. The fourth part is Student Engagement, with the questionnaire adapted from A study on students' participation in the process of music teaching in the case of the second year students of Longhu Middle School in Huainan City (2019), which contains the dual dimensions of the subject content experience and teaching methods. There are four parts: classroom environment and management, learning motivation and individual differences, and students' behaviour and psychology of participation in learning. The Reliability Result shows that all components of the tool exhibit good to excellent reliability. These results indicate that the instrument was able to consistently measure the intended components and provide accurate and consistent data. The high Cronbach's alpha values indicate that there is a strong correlation between the items of each component, which contributes to the valid measurement of the various competencies. Thus, the reliability of the questionnaire enhances the credibility and validity of the findings and supports the use of the questionnaire as a powerful tool for assessing Music Learning Platform, Teaching Strategies and Student Engagement in one Chinese University.

Data Gathering Procedures - In this study, the questionnaire content was made, checked and tested for accuracy and normalcy. Then, the researcher contacted the principal and teachers of Zhengzhou Business University and students to explain the purpose of this questionnaire in detail and obtained their agreement and support. First, 30 questionnaires were distributed to determine the validity and reliability of the study. Then, the mass questionnaire was released to the selected participants. The collected questionnaires were exported through the result export function of Questionnaire Star. Finally, after exporting the questionnaires, the data from the questionnaires were entered into Excel and the entered data were checked for accuracy.

Data Analysis - To perform data analysis, the following statistical tools were used. Frequency and percentage distribution were used to describe the profile of the respondents in terms of age, sex, major, grade or school year. Weighted means and ranking were used to identify multimedia learning platforms in terms of user experience and personalization, learning effectiveness and efficiency, motivation and attitude to learning, and recommendations and satisfaction; assess teaching strategies from the individual and methodological dimensions of music teaching, the dimensions of lesson planning and instructional design, the dimensions of educational context and environment, and the dimensions of individual differences and actual conditions, had been the objective; observed student engagement in terms of the dimensions of subject content experience and pedagogy, classroom environment and management, motivation and individual differences, and behavioral and psychological aspects of student engagement in learning.

The result of Shapiro-Wilk Test revealed that p-values of the main variable was greater than 0.05 which means that the data set is normally distributed. Therefore, Independent sample t-test for two groups and Analysis of Variance for three groups were used as part of the non-parametric tests to determine the significant differences. Likewise, Pearson Product Moment Correlation was used to test the significant relationship of the treated variables. In addition, post hoc test was also conducted. The following Likert Scale was used in assessing the variables: 4.50 – 5.00 = Strongly Agree; 3.50- 4.49 = Agree; 2.50-3.49 – Fairly Agree; 1.50 – 2.49 –Disagree; and 1.00 – 1.49 –Strongly Disagree. In addition, all data were treated using a statistical software known as PASW version 26 to further interpret the result of the study using an alpha level of 0.05 and 0.01.

Ethical Considerations - In promoting student engagement, the platform has become an active learning community by ensuring fair opportunities and encouraging interaction and sharing among students. The platform places special emphasis on students being able to share their musical works in a safe environment, while also protecting their privacy by not requiring students to compulsorily disclose any personal information. This design philosophy reflects a high level of respect for students' privacy, while also encouraging open communication and creative sharing among students. Ethical considerations are at the core of the platform's design, aiming to maintain a healthy academic atmosphere and promote the fair exchange of knowledge. The platform ensures content originality and academic integrity through a series of measures, such as copyright education, emphasis on academic integrity, and a zero-tolerance policy on misconduct. In addition, the platform promotes a learning environment based on mutual respect, in which students, teachers and creators are able to communicate and learn on the basis of mutual respect.

3. Results and discussion

Table 1
Summary Table on Music Learning Platform

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. User experience and personalization	3.09	Agree	1
2. Effectiveness and efficiency of learning	3.04	Agree	2
3. Motivation and attitude towards learning	2.97	Agree	4
4. Recommendation and satisfaction	3.00	Agree	3
Composite Mean	3.02	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 1 presents the respondents assessment on Summary Table on Music Learning Platform. The composite mean score of 3.02 indicates that respondents generally agreed. Among the items cited, User experience and personalization (3.09), Effectiveness and efficiency of learning and Recommendation and satisfaction.

This result shows that user experience and personalization are highly valued in today's technologies and services. In order to provide better services and products, various platforms and applications are striving to optimize the user experience and meet the unique needs of users through personalization settings. This focus not only increases user satisfaction but also promotes technological innovation and development. Therefore, continuous attention to and optimization of user experience and personalization settings is the key to remain

competitive and win users' trust. Users are willing to recommend the services or products they use to others to a certain extent and are satisfied with the services or products they use. Recommendation and satisfaction are important indicators of service or product quality and user loyalty, reflecting users' overall evaluation and recognition of the service or product. In order to improve the degree of recommendation and satisfaction, service providers need to continuously optimize the user experience, improve the quality of service, actively respond to user feedback, and better meet user needs.

Meanwhile, motivation and attitude towards learning (2.97) is lowest rated. This result suggests that learning motivation and learning attitude may be one of the important factors affecting learning effectiveness in the learning process. Du (2019) showed that learning motivation is the intrinsic motivation that drives students to engage in learning activities and it determines the motivation and persistence of learning. Lacking sufficient learning motivation, students may feel tired and bored with learning, thus affecting learning effectiveness. Learning attitude, on the other hand, is the cognitive and affective tendency of students towards learning, which affects their acceptance and commitment to the learning content. Educators should pay attention to the emotional needs of students to help them develop positive learning attitudes. For example, students can be encouraged to participate in classroom discussions and given timely feedback and affirmation to enhance their self-confidence and interest in learning. In addition, family and social environments also have an impact on students' motivation and attitudes towards learning. Therefore, educators need to work closely with parents and society to create a learning-friendly environment for students.

Thus, learning motivation and learning attitude are important factors affecting learning effectiveness. In order to improve students' learning effectiveness, educators need to pay attention to these two aspects and take effective measures to stimulate students' motivation and help them develop positive attitudes towards learning.

Table 2
Summary Table on Teaching Strategies

Indicators	Weighted Mean	VI	Rank
1. Experiential and Methodological Dimensions of Music Teaching	3.01	Agree	4
2. Lesson Planning and Instructional Design Dimensions	3.06	Agree	2
3. Educational Background and Environmental Dimensions	3.04	Agree	3
4. Individual Differences and Actual Conditions Dimension	3.08	Agree	1
Composite Mean	3.05	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 presents the respondents assessment on respondents' ratings of Summary Table on Teaching Strategies. The composite mean score of 3.05 indicates that respondents generally agreed.

Among the items cited, Individual Differences and Actual Conditions Dimension (3.08) , Lesson Planning and Instructional Design Dimensions followed by Educational Background and Environmental Dimensions. This finding suggests that individual differences and realities are highly valued in educational assessment. Each student has a unique background and needs, and educational environments vary. Therefore, educators need to fully understand the individual differences of students and formulate targeted teaching strategies according to the actual situation, so as to ensure that each student receives the education that best suits him or her. This not only helps to improve students' academic performance, but is also an important way to achieve educational equity. Zhang (2020) shows that curriculum planning and instructional design are also highly valued in educational evaluation. Through careful curriculum planning and instructional design, educators can better organize the teaching content and choose appropriate teaching methods, thus effectively promoting students' learning. At the same time, it also reflects educators' continuous efforts and pursuit of improving teaching quality. Therefore, continuous enhancement of curriculum planning and instructional design can help to further improve the quality of education and students' learning outcomes.

While the educational background reflects the learning foundation and developmental experiences of students, the environment has a direct impact on students' learning experiences and outcomes. In order to provide better education, educators and administrators need to pay attention to the educational background of students

and strive to optimize the learning environment to ensure that students can fully develop in a good atmosphere. Meanwhile, Experiential and Methodological Dimensions of Music Teaching " (3.01) lowest rated.

Experience is at the heart of music teaching. Music is not only a kind of knowledge, but also a kind of feeling and experience. If educators pay too much attention to the transmission of knowledge and neglect students' personal experience, then music education will lose its soul. Students may not be able to really feel the charm of music or deeply understand the connotation of music. According to Ye (2020a), method is a means to achieve the goals of music teaching. Different students have different learning needs and characteristics, so different teaching methods are needed. However, in actual teaching, educators may adopt a single or inappropriate teaching method for various reasons, thus affecting the learning effect of students. According to Gu (2020), in order to improve the quality of music education, educators need to pay more attention to students' experiences and actively explore and adopt diverse teaching methods. For example, they can let students experience the charm of music by organizing music activities, performances and competitions; at the same time, they can also adopt different teaching methods, such as individualized, cooperative or exploratory teaching methods, according to the needs and characteristics of students.

In short, education administrators also need to provide educators with adequate support and resources to promote reform and innovation in music education. Only through concerted efforts can the goals of music education be realized and students who are both musically literate and innovative be nurtured.

Table 3
Summary Table on Student Engagement

Indicators	WM	VI	Rank
1. Dimensions of disciplinary content experience and teaching methods	3.02	Agree	4
2. Classroom Environment and Management	3.12	Agree	2
3. Motivation and Individual Differences	3.14	Agree	1
4. Behavior and psychology of student engagement in learning	3.05	Agree	3
Composite Mean	3.08	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 3 presents the respondents assessment on Summary Table on Student Engagement. The composite mean score of 3.08 indicates that respondents generally agreed.

Among the items cited, Motivation and Individual Differences (3.14), Classroom Environment and Management and Behavior and psychology of student engagement in learning. The core purpose of this study was not only to simply assess student engagement, but also to provide practical and effective guidance for teaching practice through this assessment. Through the respondents' ratings, the researcher was able to gain insight into the barriers and difficulties that students may encounter in their learning process, as well as their expectations of the classroom environment and management. This valuable information provides teachers with a basis for adjusting teaching strategies, optimizing classroom management, and enhancing the student learning experience.

In summary, the researcher expects that these suggestions for improvement will promote continuous progress in educational practice, better meet students' learning needs and stimulate their learning potential. Meanwhile, dimensions of disciplinary content experience and teaching methods (3.02) lowest rated. This result reflects some problems in current educational practices. On the one hand, traditional subject content and teaching methods may fail to adequately meet the needs of students, leading them to rate this dimension poorly. On the other hand, it reveals that teachers are not innovative enough in their teaching methods to effectively stimulate students' interest and motivation in learning.

Table 4 shows the association between music Learning Platform and teaching strategies. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that there was significant relationship exists and implies that the better is the music learning platform, the better is the teaching strategies.

Table 4
Relationship between Music Learning Platform and Teaching Strategies

User Experience and Personalization	Rho-Value	p-Value	Interpretation
Experiential and Methodological Dimensions of Music Teaching	.597**	0.000	Highly Significant
Lesson Planning and Instructional Design Dimensions	.519**	0.000	Highly Significant
Educational Background and Environmental Dimensions	.635**	0.000	Highly Significant
Individual Differences and Actual Conditions Dimension	.632**	0.000	Highly Significant
Effectiveness and efficiency of learning			
Experiential and Methodological Dimensions of Music Teaching	.589**	0.000	Highly Significant
Lesson Planning and Instructional Design Dimensions	.496**	0.000	Highly Significant
Educational Background and Environmental Dimensions	.550**	0.000	Highly Significant
Individual Differences and Actual Conditions Dimension	.557**	0.000	Highly Significant
Motivation and attitude towards learning			
Experiential and Methodological Dimensions of Music Teaching	.382**	0.000	Highly Significant
Lesson Planning and Instructional Design Dimensions	.358**	0.000	Highly Significant
Educational Background and Environmental Dimensions	.345**	0.000	Highly Significant
Individual Differences and Actual Conditions Dimension	.388**	0.000	Highly Significant
Recommendation and satisfaction			
Experiential and Methodological Dimensions of Music Teaching	.438**	0.000	Highly Significant
Lesson Planning and Instructional Design Dimensions	.442**	0.000	Highly Significant
Educational Background and Environmental Dimensions	.468**	0.000	Highly Significant
Individual Differences and Actual Conditions Dimension	.461**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

The researcher drew compelling conclusions from an in-depth study of the association between music learning platforms and instructional strategies. First, the calculated r-value shows a moderate direct correlation between the two. This implies that there is some positive association between the quality of music learning platforms and instructional strategies, although this association is not extremely strong. This moderate correlation may reflect some influence of the music learning platform on instructional strategies, but it may also imply that other factors have an impact on the development and implementation of instructional strategies. Researchers may need to dig deeper into these potential factors to more fully understand the relationship between music learning platforms and instructional strategies. Second, the calculated p-value is less than the alpha level, indicating that this association is statistically significant. This means that the researcher has sufficient reason to believe that the relationship between the optimization of the music learning platform and the enhancement of teaching strategies is unlikely to be due to chance. This provides strong support for the credibility of the findings.

Huang (2020b) argues that by improving music learning platforms, educational institutions can indirectly influence the development and implementation of instructional strategies to improve the effectiveness of music education. This may motivate schools to pay more attention to updating technology and platforms to better support and facilitate the application of quality teaching strategies. These platforms can integrate data analytics tools to help teachers monitor students' learning progress and effectiveness, thus enabling them to adjust their teaching plans and strategies according to students' actual performance. Further, the digital transformation of music education not only enhances pedagogical flexibility and accessibility, but also engages a wider range of students in music learning, especially in distance education and self-directed learning, which show their unique advantages. This integration of technologies contributes to a more holistic and dynamic teaching and learning environment, thus advancing the overall quality and effectiveness of music education. Taken together, this study provides strong evidence on the relationship between music learning platforms and teaching strategies, and provides useful information for policy makers in the field of education to optimize the overall quality of music education.

Table 5 displays the association between music Learning Platform and Student Engagement. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that there was significant relationship exists and implies that the better is the music learning platform, the more that they are engaged.

Table 5
Relationship between Music Learning Platform and Student Engagement

User experience and personalization	rho-value	p-value	Interpretation
Dimensions of disciplinary content experience and teaching methods	.490**	0.000	Highly Significant
Classroom Environment and Management	.581**	0.000	Highly Significant
Motivation and Individual Differences	.598**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.403**	0.000	Highly Significant
Effectiveness and efficiency of learning			
Dimensions of disciplinary content experience and teaching methods	.463**	0.000	Highly Significant
Classroom Environment and Management	.550**	0.000	Highly Significant
Motivation and Individual Differences	.554**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.360**	0.000	Highly Significant
Motivation and attitude towards learning			
Dimensions of disciplinary content experience and teaching methods	.365**	0.000	Highly Significant
Classroom Environment and Management	.362**	0.000	Highly Significant
Motivation and Individual Differences	.351**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.341**	0.000	Highly Significant
Recommendation and satisfaction			
Dimensions of disciplinary content experience and teaching methods	.478**	0.000	Highly Significant
Classroom Environment and Management	.451**	0.000	Highly Significant
Motivation and Individual Differences	.434**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.406**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

By analyzing the association between music learning platforms and student engagement, the researcher came to compelling conclusions. First, the calculated r-value indicates a moderate direct correlation between the two. This implies that as the quality of the music learning platform increases, student engagement shows some positive trend. More specifically, the moderate level of the r-value suggests that the association is not weak, but not very strong either. This may imply that the quality of the music learning platform has a limited impact on student engagement and may be influenced by other factors. Researchers need to further explore these potential factors to more fully understand this relationship. Secondly, it is worth noting that the calculated p-value is less than the alpha level.

This finding strengthens the level of confidence in this association and indicates a high level of significance in the results. Therefore, it can be concluded that the relationship between music learning platforms and student engagement is unlikely to have arisen by chance, but is statistically significant. The researcher's perspective may emphasize the practical significance of this association. Jia (2020) argues that by enhancing the quality of music learning platforms, a school or educational institution can effectively increase student engagement. This may help to stimulate students' interest in the subject of music and promote more active participation in the learning process. In summary, this study provides strong evidence for the relationship between music learning platforms and student engagement. The relationship between platforms and student engagement provides strong evidence and useful information for educational policy makers and schools to optimize students' learning experiences. Lu (2019) showed that by investing in a state-of-the-art music learning platform, student engagement and learning outcomes can be significantly improved. In addition, these findings encourage schools and educational institutions to place greater emphasis on the integration of educational technology and to regularly update their educational tools and content to accommodate students' changing learning needs. Ultimately, these efforts will help create a more interactive and productive learning environment that will enhance students' overall learning experience and achievement.

Table 6 presents the association between teaching Strategies and Student Engagement. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that there was significant relationship exists and implies that the better is the teaching strategies, the more that they are engaged.

Table 6
Relationship between Teaching Strategies and Student Engagement

Experiential and Methodological Dimensions of Music Teaching	rho-value	p-value	Interpretation
Dimensions of disciplinary content experience and teaching methods	.510**	0.000	Highly Significant
Classroom Environment and Management	.573**	0.000	Highly Significant
Motivation and Individual Differences	.621**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.451**	0.000	Highly Significant
Lesson Planning and Instructional Design Dimensions			
Dimensions of disciplinary content experience and teaching methods	.497**	0.000	Highly Significant
Classroom Environment and Management	.585**	0.000	Highly Significant
Motivation and Individual Differences	.549**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.367**	0.000	Highly Significant
Educational Background and Environmental Dimensions			
Dimensions of disciplinary content experience and teaching methods	.519**	0.000	Highly Significant
Classroom Environment and Management	.563**	0.000	Highly Significant
Motivation and Individual Differences	.607**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.434**	0.000	Highly Significant
Individual Differences and Actual Conditions Dimension			
Dimensions of disciplinary content experience and teaching methods	.499**	0.000	Highly Significant
Classroom Environment and Management	.598**	0.000	Highly Significant
Motivation and Individual Differences	.616**	0.000	Highly Significant
Behavior and psychology of student engagement in learning	.358**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

The r-values presented in the table indicate a moderate direct correlation between instructional strategies and student engagement. This means that as instructional strategies change, student engagement shows a corresponding trend. Specifically, the moderate level of the r-value suggests that the correlation is not overly strong, but not negligible, and that there is some linear relationship. And more importantly, the calculated p-value is less than the alpha level, which is a key finding. p-values less than the alpha level (which is usually set at 0.05) indicate that we can reject the null hypothesis that the relationship between instructional strategies and student engagement is not due to random generation. This further emphasizes that the relationship between the two is statistically significant and not just a random phenomenon. Therefore, this result suggests that there is indeed a significant relationship between instructional strategies and student engagement. Student engagement increased when instructional strategies were effectively implemented. This may reflect the role of quality instructional strategies in facilitating students' active participation in learning activities. This relationship may stem from the ability of instructional strategies to stimulate students' interest and increase the attractiveness of learning, thus leading them to participate more actively in the teaching and learning process.

This finding has important implications for both educational practice and policymaking. First, Ding (2019) shows that educators and educational institutions can consciously promote student engagement by optimizing and refining teaching strategies. This may include adopting innovative teaching methods, providing interesting and challenging learning tasks, and focusing on the needs of individual students. Second, policymakers could consider emphasizing the importance of teaching and learning strategies in education policy and providing support and resources to educators to improve the overall quality of the education system. Such support could include professional development training, updated teaching resources, and more advanced technological tools. Education policies should encourage and facilitate the use of educational technology to meet the needs of the digital age and cater for students with different learning styles. This will not only enhance the flexibility and efficiency of teaching and learning, but also help prepare students for their future studies and careers.

Overall, it is important to note that correlation does not mean causation. Although the researcher observed a correlation between instructional strategies and student engagement, it cannot simply be concluded that instructional strategies cause student engagement. Other unmeasured factors or potential interactions may also be influencing the relationship. Therefore, further research and in-depth analysis is necessary to more fully understand the nature and mechanisms of this relationship.

Table 7
Proposed Teaching Improvement Plan

Key Result Area	Plan Objective	Strategies/ Activities	Success Indicators	Persons Involved
Motivation & attitude towards learning	- To stimulate students' intrinsic interest and motivation for music learning through the provision of engaging learning content and activities. - Helping students develop a positive mindset towards learning and encouraging them to remain optimistic and confident in the face of challenges.	- Create engaging learning scenarios using gamification, interactivity and multimedia elements to stimulate students' interest in learning. - Tailor-made personalized learning plans and resource proposals for students based on their interests, abilities and learning styles. - Stimulate students' curiosity and desire for independent exploration by setting open-ended learning tasks and challenges. - Give students timely feedback on their learning and recognition of their achievements to enhance their self-confidence and motivation.	- Learning Motivation Rate (40%): Through Questionnaires and students' feedback, measure the extent to which students' interest and motivation in music learning have increased after using the platform. - Positive attitude performance rate (30%): to observe students' attitude performance in the learning process - Self-directed learning participation rate (20%): tracking the frequency and depth of students' active participation in self-directed learning activities (e.g. self-selected courses, self-assessment, etc.) to measure the improvement of their self-directed learning ability. - User Satisfaction (10%): Measure students' satisfaction with the overall services and learning experience of the platform through user satisfaction surveys.	students
Educational Background & Environmental Dimensions	- Ensure that the educational content and methods provided by the music learning platform match the educational background and needs of users. - Create an environment conducive to music learning for users, reduce external distractions and improve learning efficiency.	- Design multiple learning paths and resources to meet the needs of users with different educational backgrounds and knowledge levels. - Help users focus better by providing a clear learning interface, reducing unnecessary distractions and optimizing learning tools. - Help users focus better by providing a clear learning interface, reducing unnecessary distractions and optimizing learning tools. - Create learning communities to facilitate exchanges and collaborations between users from different educational and cultural backgrounds. - Regularly collect and analyze data on environmental factors that affect learning, such as users' learning time, location and preferences, in order to optimize the platform services.	- Educational background match (30%): through user surveys and learning behavior analysis, measure how well the educational content and methods provided by the platform match users' educational background. - Satisfaction with Learning Environment (25%): Through user feedback, assess how satisfied users are with the learning environment created by the platform, such as the clarity of the interface and the ease of use of the tools. - Collaborative Learning and Cultural Exchange Activity (20%): Track the frequency of user interactions in the learning community, the number of collaborative projects, and the depth of cultural exchange to measure the effectiveness of the strategy. - Environmental Data Application Effectiveness (15%): Analyze the extent to which optimization measures taken through the collection of environmental data have improved the user learning experience and learning outcomes. - User retention and return visit rate (10%): Examine the retention of users over time and the frequency of return visits as a measure of user stickiness after the improvement of educational background and environmental factors.	students
Experiential and Methodolog-ical Dimensions of Music Teaching	- Through continuous teaching practice, accumulate and refine effective music teaching experience in order to improve teaching quality. - Combine modern educational concepts and technical means to continuously improve the music teaching methodology system to meet the needs of different learners.	- Designing and implementing various forms of music teaching activities, including group teaching, one-on-one tutoring, workshops, etc., to enrich learners' learning experience. - build a platform for teachers to exchange ideas and encourage them to share their music teaching experience and methods, so as to realize the sharing of resources and common growth. - Paying attention to the latest developments in the field of music education at home and abroad, researching and trying to apply advanced teaching methods in actual teaching.	- Degree of accumulation of music teaching experience (30%): The degree of accumulation of music teaching experience is measured by the activity of the teachers' exchange platform and the quantity and quality of experience sharing. - Degree of perfection of music teaching methodology (25%): to assess the degree of perfection of music teaching methodology by taking into account the application of modern educational concepts and technical means. - Diversity of Teaching Activities and Learner Participation (20%): analyze the implementation of different types of music teaching activities and the degree of learner participation to measure the diversity of teaching activities. - Teaching Feedback Satisfaction and	students

		- Through questionnaires and learner interviews, we continuously collect and analyze teaching feedback in order to make timely adjustments to teaching strategies and methods.	Improvement Delivery Rate (10%): to assess the effectiveness and rate of response of the teaching feedback mechanism through the satisfaction survey of teaching feedback and the implementation of improvement measures.	
Behavior and psychology of student engagement in learning	- stimulate students' active activity in music learning by optimizing learning experiences and teaching methods. - helping students to develop the mental habits and abilities for independent and lifelong learning.	- Design learning activities and tasks that are interactive and encourage active learner input, collaborative learning and sharing of experiences. - Provide learning resources and instruction that are personalized based on students' learning styles, interests, and needs in order to enhance student motivation. - Through regular surveys and feedback facilities, the program understands the psychological needs and challenges of students in the learning process, and provides timely support and intervention.	- Rate of increase in student engagement (30%): by comparing student engagement data before and after the strategy was implemented. - Effectiveness of the psychological construction of independent learning (25%): Through questionnaires and student interviews, assess the degree of enhancement of students' awareness, ability and habit of independent learning. - Enhancement of Learning Interactivity and Cooperation (20%): Observe the frequency of students' interactions during the learning process and the number and quality of cooperative projects to measure the degree of enhancement of learning interactivity and cooperation. - Personalized Learning Support Satisfaction (15%): A user satisfaction survey is conducted to find out how satisfied students are with personalized learning resources and guidance. - Satisfaction of Students' Psychological Needs (10%): To assess the extent to which students' psychological needs are met in the learning process through psychological surveys and feedback Analysis	students
Dimensions of disciplinary content experience and teaching methods	- Ensure that students have a deep level of appreciation for the core concepts, theories, and history of the discipline of music. - Explore and practice innovative teaching methods to improve teaching efficacy and student interest in learning.	- Keeping up-to- date and improving the body of knowledge in the subject of music. - Integrate music with other disciplines - Provide continuous teacher professional training and development opportunities	- Degree of Subject Content Understanding (30%): assesses the degree of students' understanding of music subject content through tests, assignments, and class discussions. - Degree of interdisciplinary content integration (20%): analyze the degree of integration between the music discipline and other disciplines. - Application Rate of Innovative Teaching Methods (25%): Statistics on the frequency and breadth of innovative teaching methods practiced by teachers to measure the extent of their application. - Teacher Training Participation and Satisfaction (15%): To examine teachers' motivation to participate in training activities and their satisfaction with the training results. - Student Feedback and Teaching Quality Improvement (10%): to collect students' feedback on teaching content and methods, and to make continuous improvement of teaching quality based on the feedback.	students

4. Conclusions and recommendations

The majority of the respondents were young males, between the ages of 19 and 25. They are majoring in education and belong to the freshman class. Most of the respondents identified user experience and personalization and learning Effectiveness and Efficiency as the most important dimensions that play a critical role in improving the learning experience and learning outcomes. The majority of respondents perceived the highest dimensionality in the Lesson Planning and Instructional Design Dimensions and the Individual Differences and Actual Conditions Dimension. Respondents felt that student engagement was significantly

impacted in Motivation and Individual Differences. Among the respondents grouped by grade level, freshmen significantly outperformed the other groups on the assessment. There exists strong direct relationship between music learning platforms, instructional strategies, and student engagement. The teaching improvement program in Chinese colleges and universities was proposed.

The government may introduce relevant policies to encourage and support the construction and development of university music learning platforms, and provide financial and technical support and formulate relevant standards and regulatory mechanisms to ensure the quality and standardization of music learning platforms and protect students' rights and interests. Teachers may continue to explore and practice innovative teaching strategies, combining online and offline teaching methods to improve teaching effectiveness; pay attention to students' individual needs, provide targeted teaching and counseling, and help students develop their full potential and maintain an awareness of the latest developments in the field of music education, and continue to learn and improve their professionalism. Teachers may implement a variety of assessment methods, including formative assessments, peer evaluations, and self-reflection exercises, to provide students with timely feedback and opportunities for improvement. Students may make full use of the music learning platform and actively participate in course learning, discussions and practical activities to enhance their musical skills and literacy and cultivate the ability of independent learning and take the initiative to explore the various learning resources on the platform according to their own interests and goals. The teaching improvement plan may be submitted for discussion and implementation. Future researchers may conduct similar studies, but with a focus on the use of blended learning methods to teach oriental music or traditional pieces.

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