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The Effect of Music Notation Software on Improving the Level of Improvisation Playing and Singing of Children's Songs for College Students

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Abstract

Background and Aim: Traditional music education methods may be outdated and fail to engage students accustomed to interactive learning. Integrating computer technology into teaching can provide a dynamic platform to enrich teaching methods and address the monotony of conventional instruction. This study is designed to explore the efficacy of JPW software in enhancing children's impromptu playing and singing skills, its role as an educational tool in advancing these musical competencies, and the level of satisfaction among children with its use in learning environments.

Materials and Methods: The study focuses on second-year Preschool Education majors from Yiyang Normal College of Higher Vocational Education. Participants were divided into two groups: an experimental group and a control group, each comprising 42 students. Under the mentorship of their instructors, both groups were tasked with learning to play and sing ten children's songs over 12 weeks. In the qualitative phase of the study, ten students from the experimental group were randomly selected for interviews conducted in the 13th week. The control group was taught using conventional methods, whereas the experimental group was introduced to the JPW music notation software to support their learning of children's song improvisation and singing. An independent samples T-test was employed for statistical hypothesis testing, complemented by content analysis for the qualitative assessment of data.

Results: Quantitative results: there is a significant improvement in the experimental group students' performance in accuracy, artistic expression, piano accompaniment, arrangement ability, and singing and playing coordination skills when JPW software is applied in children's song improvisation courses. Qualitative results: students have responded positively to the application of JPW software in children's song improvisation accompaniment classes.

Conclusion: This study's results show that JPW software is significantly superior to traditional teaching methods in cultivating students' musical ability.

Keywords: JP-Word Software; Accuracy; Artistic Expression; Piano Accompaniment and Arrangement Ability; Singing and Playing Coordination Skills

Introduction

In the preschool education curriculum of higher vocational colleges, the impromptu playing and singing of children's songs stands as a cornerstone course, underscoring the indispensable role of music in early childhood development (Li, 2013). Music notation software is crucial in modern education, improving music material quality and aiding teachers in instruction, which boosts teaching efficiency (Mona & Hidayat, 2021).

The trajectory of music education has pivoted with technological progress, steering from conventional methods to more interactive and engaging learning experiences made possible by technology (Ma, 2019). The incorporation of computer technology into music education has significantly transformed everyday classroom experiences. This integration revolutionizes teaching methods, diversifies learning resources, and enriches the content available to students, making the learning process more engaging and accessible (Wang, 2015). This shift is pivotal in examining the potential of software like JP-word music notation software (JPW) to augment music education, particularly in preschool settings.

Students entering preschool education often have limited musical backgrounds, frequently grappling with challenges such as slow music score reading, intonation issues, rhythm inaccuracies, and difficulties in interpreting mood and style (Luo, 2019). These obstacles can erode self-confidence and engender a passive learning stance, potentially impacting their performance in kindergarten teacher qualification interviews and their capacity to lead music and art activities in kindergartens.

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This study addresses the academic gap by investigating the integration of JPW software into preschool education, focusing on its impact on students' impromptu playing and singing abilities. It builds upon a growing body of research that highlights the transformative potential of music notation software and other educational technologies in traditional music education methods (Smith, 2018). Despite these advancements, research on the application of such software in early childhood education, especially in the context of spontaneous playing and singing, remains sparse.

By assessing the software's effectiveness in enhancing musical skills and student satisfaction, this study aims to provide empirical evidence of the value of music notation software in early childhood music education. The findings will shed light on how technology can be leveraged to improve learning outcomes, foster creativity, and equip future educators with the tools to navigate the evolving landscape of early childhood music education. This research is significant as it fills a research void and informs pedagogical practices, advocating for the innovative integration of digital tools in the cultivation of the next generation of musicians and educators.

Objectives

This study aims to investigate the effectiveness of JPW software in enhancing preschoolers' impromptu playing and singing abilities, its impact as an instructional tool on improving preschoolers' impromptu musical skills, and preschoolers' satisfaction with its utilization in the educational environment. These objectives can be summarized into the following three inquiries:

1. Using JPW software as an aid to improve students' impromptu playing and singing ability.
2. To determine the effect of JPW software as a teaching aid to improve preschool students' impromptu playing and singing.
3. To determine student satisfaction with using JPW software as a teaching aid.

Literature review

Music notation software has become an integral part of modern music education, offering a dynamic and interactive approach to learning that aligns with the digital-native mindset of contemporary students (Fadel & Trilling, 2010). These tools have been designed to cater to a wide array of musical needs, from composition to performance and analysis, and are recognized for their capacity to enhance the educational experience. Notable software such as Finale, Sibelius, and MuseScore provide comprehensive features that have been the subject of scholarly research, exploring their impact on music education (Norman, 2023). In China, software like TT Composer and JPW Music Notation Editor have gained popularity, offering functionalities that are competitive with their international counterparts (Yu, 2008).

JP-Word is a music notation software with strong capabilities in China. Compared to other software, it not only can arrange various complex scores but also has three distinct features 、When clicking on a score created on its platform, one can see the score's cursor and the music effect that plays synchronously with the sound, and the playback sound is accurate and stable.2、The scores written on its platform, especially the expressed symbols, can be demonstrated through the synchronized playback of the score and sound, allowing it to present a relatively perfect music audio with certain emotions.3、The music created on its platform can have its playback speed freely adjusted according to the singer's needs. (Li, 2013).

The integration of music notation software in educational settings has been shown to significantly improve students' musical abilities. It allows for a more engaging and personalized learning experience, which is particularly beneficial for students with diverse learning styles (Bai & Wang, 2019). The software's capacity to facilitate the creation and sharing of learning materials online has proven to be highly efficient, enabling piano students to practice ear training at home without the need for a live piano. This approach not only enhances learning efficiency but also supports the development of aural skills, as students can listen to and refine their compositions through playback (Bai & Wang, 2019).

Furthermore, the application of music notation software extends to professional musicians and composers, streamlining the composition process and allowing for rapid experimentation with melodies,

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harmonies, and rhythms. The immediate playback feature ensures that composers can make informed decisions about their musical direction, thus enhancing the creative process (Zhang & Li, 2015). The use of such software in educational settings has been linked to improved pitch and rhythm accuracy, better musical expressiveness, and enhanced piano accompaniment and arrangement abilities (Ayderova et al., 2021). It also plays a significant role in enhancing students' expressiveness in music by allowing them to follow scores with a cursor, which boosts engagement and accuracy (Tan, 2019).

Conceptual Framework

This study employed a mixed-methods approach, with quasi-experimental samples selected through purposive sampling based on specific criteria: 1. Majoring in Early Childhood Education. 2. Second-grade elementary students.3. Admitted as graduating students. The sample size comprised 84 students, divided equally into an experimental group and a control group. The experimental group utilized JPW software as a teaching aid, while the control group followed traditional learning methods. The experiment spanned 12 weeks, beginning with a pretest in the first week, using the assessment standards of children's song performance from Yiyang Normal College, evaluated by three professional piano teachers. At the end of the 12th week, a posttest was conducted, assessed by the same three piano teachers, focusing on accuracy, artistic expression, piano accompaniment and arrangement ability, and singing coordination. Subsequently, in the 13th week, ten students from the experimental group were randomly selected for face-to-face structured interviews to gather their perspectives on using JPW software as a teaching aid. These structured interviews aimed to evaluate their perceptions of JPW software as a tool in piano lessons and identify potential areas for improvement. Interview questions included: Q1: Briefly describe your experience using JPW software in children's song improvisation classes. Q2: Share the most valuable and interesting aspects of using JPW software in children's song improvisation classes, and explain why.Q3: Do you think JPW software is helpful to improve your children's song improvisation level? How?

Methodology

This study investigates the impact of JPW software on preschool education students' abilities to improvise in singing and playing children's songs using a mixed-method approach. The quantitative phase, a 12-week quasi-experimental design, compared an experimental group using JPW software with a control group receiving traditional teaching. Both groups, consisting of 42 students each with prior piano scores between 85 and 90, learned ten songs and were assessed by three professional teachers using a pre-test and post-test design. The qualitative phase included structured interviews with ten students from the experimental group to reflect on their learning experience and satisfaction with JPW software, validated by a panel of education experts. The study aims to determine if JPW software significantly improves students' impromptu performance skills and their satisfaction with its use in education.

Results

The research results are divided into two types: quantitative results and qualitative results.

Quantitative results:

The results of independent samples T-tests demonstrate that the application of JPW software in teaching children's song improvisation has improved students' performance in accuracy, artistic expression, piano accompaniment and arrangement ability, and singing and playing coordination skills. Consequently, the hypothesis that there is no difference between the experimental and control groups in the application of JPW software in children's song improvisation courses in terms of accuracy, artistic expression, piano accompaniment, arrangement ability, and singing and playing coordination skills is rejected.

The null hypothesis is rejected, indicating that there is a significant improvement in the experimental group students' performance in accuracy, artistic expression, piano accompaniment, arrangement ability, and singing and playing coordination skills when JPW software is applied in children's song improvisation courses.

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Qualitative results:

The interview results show that students have responded positively to the application of JPW software in children's song improvisation accompaniment classes, expressing satisfaction and a willingness to continue learning in this manner.

Interviews with students using the JPW software in children's song improvisation classes revealed high satisfaction. Students appreciated the dynamic scoring for enhancing learning and musical expressiveness. The software's ability to select different timbres and adjust speeds was also valued, contributing to improved musical perception and practice efficiency. The software was unanimously seen as helpful in improving improvisation skills, with benefits including increased accuracy, expressiveness, and hand coordination during practice. Overall, the JPW software made the learning process more engaging and effective for students.

Analysis of student interviews reveals key factors enhancing satisfaction and learning with the JPW software. Its innovative features, like dynamic scores and timbre editing, make learning engaging and fun, boosting interest and participation. Personalization allows adjusting to individual learning paces and preferences, improving efficiency and experience. The software's intuitive interface enhances music theory and performance skills, with dynamic scores aiding in grasping rhythm and pitch. It also aids teachers in personalized instruction. The software fosters autonomy in learning, making the process enjoyable and efficient. There's a desire for a mobile version to facilitate out-of-classroom learning. Overall, the JPW software significantly improves music knowledge, skills, and learning satisfaction, with its potential in mobile learning offering valuable insights for educational technology advancements.

The qualitative results section shows people's positive views on the application of JPW software in children's song improvisation courses, supporting the findings of the quantitative research.

Discussion

The study's findings, which indicate notable enhancements in students' musical capabilities through the JPW software, support and expand upon previous research that underscores the significant role of educational technology in transforming music education (Smith, 2018). The observed improvements in accuracy, artistic expression, and coordination skills are in line with previous reports on how interactive music software can promote a more profound grasp of intricate musical concepts (Smith, 2018). Moreover, the qualitative findings, showing high levels of satisfaction and a strong inclination towards continued use of the software, affirm the idea that technological integration can more potently engage students compared to conventional pedagogical approaches.

Despite the positive outcomes, it is crucial to recognize the study's limitations. The sample population was specifically selected from students with minimal prior musical experience, which may restrict the applicability of these results to a more diverse group with varying degrees of musical proficiency. Additionally, the study's design, centered on a single software within a controlled educational context, might not fully represent the software's efficacy across different educational settings or with diverse teaching strategies. Future research should aim for a more heterogeneous sample and consider a broader range of educational scenarios to further validate and expand on these results.

Subsequent studies should assess the impact of JPW software on a broader spectrum of musical skills across various educational tiers. Examining the software's efficacy with students of differing musical backgrounds or within distinct educational frameworks could yield a more holistic view of its potential. Moreover, longitudinal research could provide valuable insights into the enduring effects of such software on students' musical growth and academic achievements.

The practical significance of this study is profound within the realm of early childhood education. The incorporation of JPW software in educational settings can exemplify an advanced approach to music education, especially beneficial for students with limited musical backgrounds. Educators can utilize the software's dynamic scoring and timbre editing functionalities to customize lessons according to individual learning paces and preferences, thus creating a more captivating and productive educational setting.

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Furthermore, the software's adaptability for mobile learning could extend learning opportunities beyond the confines of the classroom, encouraging independent study and practice.

Conclusion

The study at Yiyang Normal University demonstrates the JPW software's significant positive effects on the musical abilities of early childhood education students. A mixed-methods approach with 84 sophomores showed improvements in accuracy, artistic expression, piano accompaniment, and singing and playing coordination. Quantitative analysis revealed higher post-test scores in the experimental group, indicating the software's effectiveness. Qualitative interviews highlighted students' appreciation for the software's dynamic musical notation and customization features, which enhanced their sight-reading and expressiveness.

The JPW software's impact was consistent across participants, as shown by the reduced standard deviation in post-test scores. It notably excelled in enhancing singing and playing coordination, a critical skill for music integration. Students were highly satisfied with the software, praising its personalized learning approach and its role in deepening their musical understanding and appreciation.

The research strongly supports the JPW software as a valuable educational tool, suggesting its broader use in music education. Its interactive and adaptive nature offers a comprehensive learning experience, with the potential for future enhancements like mobile versions to increase its educational impact. The study's outcomes, confirmed by student feedback and musical ability improvements, endorse the JPW software as an innovative solution in music pedagogy.

Recommendation

For practical implementation in educational settings, the following recommendations are suggested: Curriculum Integration: Integrate JPW software into the curriculum as a standard tool for music education, starting with pilot programs in select institutions and scaling up based on feedback and outcomes. Student-Centered Learning: Encourage a student-centered approach where the software is used to tailor learning experiences to individual needs, promoting personalized learning paths.Assessment and Feedback Mechanisms: Develop robust assessment tools that measure the effectiveness of software use in enhancing musical skills, and establish feedback mechanisms to continuously improve the software and its educational application.Community Engagement: Engage with the broader educational community, including parents and students, to raise awareness about the benefits of using JPW software and to gather insights for further enhancement.Collaboration with Developers: Foster collaboration between educational institutions and software developers to ensure that the software evolves in line with educational needs and advances in technology.

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