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Effectiveness Study of Applying Earmaster for Ear Training in Chinese University Students

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Abstract

Background and Aims: Although the use of technology integration in music education in China has gradually increased, there is still a lack of empirical evidence on the use of educational technology, particularly digital tools, in auditory training. Traditional auditory training methods, such as manual practice guided by a piano or teachers, had some educational value; however, in large-scale classroom settings, they were frequently hampered by individual differences, time constraints, and insufficient teaching resources, making it difficult to meet students' individualized learning needs, particularly in key areas such as pitch recognition, rhythm perception, and timbre discrimination. As a result, understanding how to use modern educational technology to improve the effectiveness of auditory training and close this gap was critical for practical purposes. Against this backdrop, this study innovatively integrated Earmaster, a digital tool specifically designed for music education, into auditory training courses at Chinese universities, to investigate its effectiveness in improving students' auditory skills. By providing personalized practice plans and instant feedback, Earmaster effectively addressed issues in traditional teaching methods caused by resource constraints or individual differences. This study used constructivist learning theory to discuss how to use Earmaster to help students improve their pitch recognition, rhythm perception, and timbre discrimination skills. This not only improved empirical research on technology in music education but also provided theoretical foundations and practical references for future educational technology applications.

Materials and Methods: This study adopts a quasi-experimental approach. The researchers selected a total of 67 first-year music students from a university in Fujian. After classifying the students according to the school's class capacity, they were divided into Music Class 1 (34 students) and Music Class 2 (33 students). Class 1 served as the control group, while Class 2 was the experimental group. The entire experiment lasted 10 weeks, with two classes per week, each lasting 90 minutes. In the first week, students were introduced to the experiment, the teaching methods, and the content. All 67 students took a pre-test to assess their actual musical abilities. Starting from the second week, the two groups underwent 8 weeks of training with the same teaching content. Music Class 1 followed traditional teaching methods, while Music Class 2 received instruction using the Earmaster software. Classroom exercises and homework were also conducted using Earmaster. In the tenth week, a post-test was conducted. The researchers compiled and analyzed the process data and post-test results, comparing the changes between the pre-test and post-test.

Results: This study integrated the digital tool Earmaster into auditory training courses at Chinese universities and demonstrated its efficacy in improving students' auditory skills. The findings revealed that after a structured intervention with Earmaster, students' performance in pitch recognition, rhythm perception, and timbre discrimination improved significantly. Earmaster addressed the issues caused by resource limitations and individual differences in large-scale classroom settings more effectively than traditional auditory training methods, using personalized exercises and instant feedback. This study not only addressed an empirical gap in the use of educational technology in auditory training, but it also provided theoretical foundations and practical references for the future use of digital tools in music education.

Conclusion: This study found that the digital tool Earmaster significantly improved students' auditory skills compared to traditional methods. It provided both empirical evidence and practical insights into the future use of digital tools in music education.

Keywords: Earmaster; Ear Training; Pitch Recognition; Rhythm and Beat Perception; Timbre Recognition

Introduction

The integration of modern technology into education has brought significant transformations to teaching practices worldwide. In the field of music education, this shift is particularly evident as educators seek to enhance traditional methods with innovative digital tools. Despite the established role of ear training in music education, research on the application of educational technology, particularly in Chinese

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universities, remains limited. Johnson et al. (2015) note that the adoption of personalized learning environments, facilitated by digital tools, has the potential to significantly improve student engagement and learning outcomes (*Horizon Report*). However, in China, the use of such technology in music education is still in its early stages, with limited empirical evidence supporting its effectiveness.

Historically, ear training has relied heavily on instructor-led exercises, which, while effective, present limitations in terms of scalability and adaptability to individual learning needs. Gordon (2007) highlights that traditional ear training methods often do not accommodate the diverse learning paces of students, potentially hindering the development of comprehensive aural skills (*Learning Sequences in Music: Skill, Content, and Patterns*). This has led to an increased interest in exploring digital tools like Earmaster, which offer interactive and adaptive learning experiences.

Research by Bella et al (2007) demonstrated that students who trained with digital tools such as Earmaster showed significant improvements in pitch and rhythm discrimination compared to those who used traditional methods (*Journal of the Acoustical Society of America*). This study underscores the potential of integrating technology into ear training to enhance auditory skills. However, as Ho & Law (2009) discuss, the adoption of such technology in Chinese music education faces cultural and institutional barriers, limiting its widespread use (*Asia-Pacific Journal of Education*). These challenges highlight the need for further research to assess the effectiveness of tools like Earmaster in the Chinese context.

This study aims to address this gap by evaluating the effectiveness of Earmaster in improving pitch recognition, rhythm perception, and timbre discrimination among university students in Fujian, China. By comparing the outcomes of traditional ear training methods with those enhanced by Earmaster, this research seeks to provide empirical evidence to support the integration of digital tools in Chinese music education. The findings of this study could inform curriculum development and pedagogical strategies, ultimately contributing to the enhancement of music education quality in Chinese universities.

Objectives

The primary objective of this study is to systematically evaluate the effectiveness of the Earmaster software in enhancing specific auditory skills among first-year music students in a university setting in Fujian, China. To achieve this, the study is guided by the following specific, measurable, achievable, relevant, and time-bound (SMART) objectives:

1. The application of Earmaster technology significantly improved the ability to perceive pitch after pitch perception training.
2. The application of Earmaster technology significantly improved the ability to perceive rhythm and beat after rhythm and beat perception training.
3. The application of Earmaster technology significantly improved the ability to differentiate between different timbres after timbre perception training.

Literature review

With the continuous development of educational technology, the practice methods in ear training within music education have undergone significant changes. Traditional ear training methods, such as pitch recognition, rhythm training, and timbre discrimination, had long relied on teacher-led repetitive exercises. While these methods were effective to some extent, they often failed to inspire students' initiative and interest (Schüler, 2021). The introduction of digital technology, especially software like Earmaster designed specifically for ear training, transformed the traditional teaching model of auditory training. Through its interactive and personalized design, it provided students with a more flexible learning experience, making self-directed learning and individualized feedback possible. Constructivist learning theory played an important role in understanding the application of these digital tools.

According to Piaget (1971) and his constructivist learning theory, students actively participate and interact to construct knowledge, rather than passively receiving it. This theory emphasizes that learners should actively interact with learning materials during the process of knowledge construction, forming their

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personal understanding and cognitive structures. In the context of ear training, traditional teaching methods often neglect students' autonomy, limiting their ability to construct knowledge. However, digital tools like Earmaster provided self-paced exercises, instant feedback, and various learning paths, enabling students to actively engage in different aspects of ear training during self-directed learning, thus helping them better develop their auditory perception of pitch, rhythm, and timbre (Andrianopoulou, 2018).

Constructivist theory also emphasizes the contextual nature of knowledge and individual differences among learners. Different students could have significant variations in auditory skills, musical background, and learning styles, making it difficult for traditional "one-size-fits-all" teaching methods to effectively meet these diverse needs. Digital tools like Earmaster, through customized training content and learning plans, helped students learn based on their actual abilities and progress, thereby improving learning efficiency and outcomes. Yilmaz (2011) research demonstrated the significant effectiveness of Earmaster in enhancing students' auditory skills, especially in the training of pitch, rhythm, and timbre. This tool allowed students to train at their own pace through personalized learning design, helping them better develop their auditory skills.

However, existing literature focused more on exploring the short-term effects of these digital tools, while there was less discussion on long-term learning outcomes and the generalizability of these tools. For example, although Maharaj (2010) acknowledged the advantages of digital tools in improving student engagement and learning outcomes, they also pointed out the lack of empirical studies on the long-term effectiveness of these tools, particularly in Asian cultural contexts. This limitation was particularly prominent in the educational background of China. Chinese students and teachers had relatively low acceptance of digital tools, partly due to the deep-rootedness of traditional teaching methods and skepticism towards emerging technologies. Li and Zhang (2019) noted that these cultural and institutional factors significantly impacted the application and promotion of digital tools in China's educational system. Therefore, a literature review is not only needed to discuss the application of constructivist theory but also should delve into the impact of cultural and institutional factors on the adaptability of digital tools in different educational contexts. Furthermore, integrating constructivist learning theory with practical teaching applications could better support research.

In ear training, digital tools like Earmaster, by providing flexible learning paths and personalized exercises, effectively promoted students' active participation and knowledge construction, aligning with the core principles of constructivism. Although these tools showed significant short-term learning effects, future research needed to continue exploring their long-term effectiveness and adaptability in different cultural contexts, to gain a more comprehensive understanding of their application in global ear training (Webster, 2011).

In conclusion, constructivist learning theory provided a solid theoretical foundation for the application of digital tools in auditory training. Earmaster, through its interactivity and personalized design, helped students actively construct auditory perception skills and offered more flexible and effective solutions for ear training. However, gaps in the existing literature remained concerning long-term effects and cultural adaptability. Future research is needed to delve into these areas to further advance the application of digital tools in global music education.

Conceptual Framework

The theoretical framework of this study was based on constructivist learning theory, which was proposed by Piaget. This theory emphasizes that learners actively construct knowledge through interaction with learning materials, rather than passively receiving information. Within this framework, Earmaster's design, through its interactivity, adaptability, and real-time feedback functions, encouraged students to actively participate in aural training, thereby improving core aural skills such as pitch recognition, rhythm perception, and timbre discrimination. Specifically, the use of Earmaster as the independent variable was hypothesized to significantly enhance students' abilities to recognize pitch, perceive rhythm and distinguish timbre through its interactive exercises and personalized feedback mechanisms.

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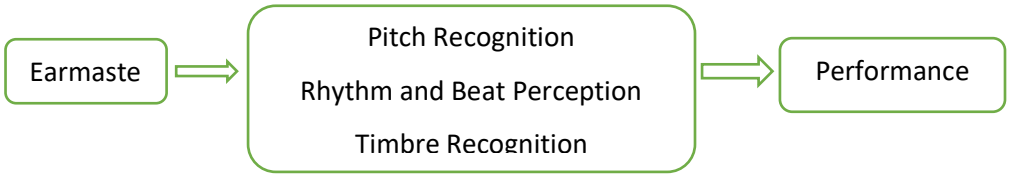

Figure 1 Visual Model: Path of Earmaster's Impact on Dependent Variables

This hypothesis was supported by empirical research. For instance, Yilmaz (2011) demonstrated that Earmaster had significant effects in improving pitch recognition and rhythm perception, with students showing steady improvement in aural skills after continuous use of Earmaster. Maharaj (2010) further validated the effectiveness of digital tools in long-term aural skills training, particularly in rhythm perception and pitch recognition. These studies showed that Earmaster's interactivity and adaptive training paths helped students adjust and improve continuously, thereby actively constructing deeper levels of aural understanding.

Through this interactive and adaptive design, Earmaster was able to gradually enhance students' overall aural skills by improving pitch recognition, rhythm perception, and timbre discrimination. A visual model illustrated how the use of Earmaster affected these dependent variables, as students adapted to progressively increasing difficulty levels, ensuring that the cognitive load at each stage remained appropriate, ultimately leading to significant improvement in aural skills. The duration of training and the adaptability of the exercises acted as key mediating factors, ensuring that students could flexibly adjust their training progress and difficulty levels according to individual needs, further enhancing learning outcomes.

In conclusion, Earmaster, as a digital tool designed based on constructivist learning theory, helped students improve their aural skills through interaction, feedback, and adaptive exercises. Empirical studies further supported the validity of this framework and confirmed the effectiveness of Earmaster in aural training. This theoretical framework illustrated how Earmaster, through adaptive training paths and personalized feedback, promoted the improvement of students' aural abilities, ultimately leading to sustained enhancement of overall aural skills.

Methodology

The study employed a T-test method for data analysis, using a quasi-experimental design. The study lasted for a total of 10 weeks, including 1 week of pre-testing, 8 weeks of experimental intervention, and 1 week of post-testing. The specific steps were as follows:

Participant Selection: The study selected 67 first-year music students from a university in Fujian. These students had passed the 2023 entrance examination and were divided into two groups, Music Class 1 and Music Class 2, based on class capacity.

Measured Variables: The variables measured in the study included pitch recognition training, rhythm and beat perception training, and timbre discrimination training.

Experimental Control: The experiment lasted for 10 weeks, with two sessions per week, each lasting 90 minutes. After each class, specific assignments were given, and students completed the training outside of class.

Research Population and Sample

The study used a census sampling method and selected 67 first-year music students from the 2023 cohort at a university in Fujian as participants. The advantage of this census sampling method lies in covering the entire population, ensuring the comprehensiveness and representativeness of the sample. Since all first-year music students admitted in 2023 participated in the study, this method reduced potential selection bias and provided broader applicability for the research. Particularly in a study aiming to evaluate

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the effect of the Earmaster software on all first-year music students, census sampling helped better reflect the actual situation of the entire student population, thereby enhancing the external validity of the results.

However, census sampling also had limitations, especially in terms of internal validity, as there was no random assignment. In this study, although all 67 students were included, they were divided into two groups based on class size rather than through random assignment. This grouping might have introduced potential biases, such as differences in teachers or peer interactions that could affect student performance. Additionally, the census sampling method did not account for individual differences among students, such as age, gender, or musical background, which could have influenced the study's outcomes. Therefore, while census sampling ensured comprehensiveness, the lack of random assignment might have limited the ability to draw clear causal inferences between the experimental and control groups.

To address these potential biases, the study used pre-test control in data analysis, ensuring that the experimental and control groups had comparable baseline abilities before the intervention, thus reducing the impact of non-experimental factors on the results. Nevertheless, researchers needed to remain cautious when interpreting the results, carefully considering these potential confounding variables and their effect on the study's internal validity.

Data Collection

All students participating in the experiment, whether in the experimental group or the control group, underwent pre-tests in the first week and post-tests in the tenth week. The experiment lasted a total of eight weeks. The specific process is shown in the diagram below, Post-tests were conducted in the tenth week, and data were analyzed using Jamovi software to obtain the results of this experiment.

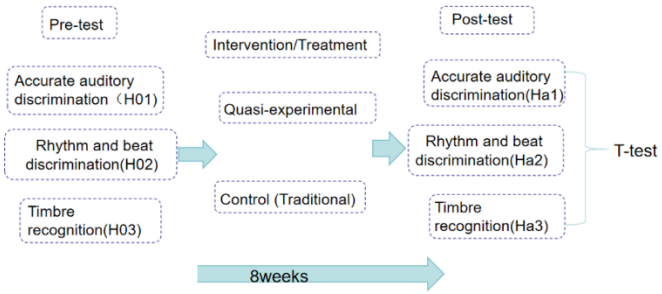

Figure 2 Experimental Flowchart

The researcher conducted a detailed statistical analysis of the pre-test and post-test data to evaluate the effectiveness of Earmaster technology in enhancing students' sight-singing and ear-training skills. First, an independent samples t-test was used to compare the pre-test scores of the experimental and control groups, primarily assessing the students' initial abilities in pitch recognition, rhythm and beat perception, and timbre discrimination. The analysis showed no significant differences between these variables in the two groups, indicating that the student's ability levels were roughly equivalent at the start of the experiment, providing a reliable foundation for assessing the subsequent effects of the intervention.

After the experiment concluded, the researcher analyzed the post-test data by calculating the means and standard deviations to assess changes in students' performance before and after the intervention. Additionally, a paired samples t-test was used to evaluate within-group differences before and after the intervention, and an independent samples t-test was used to compare the post-intervention performance of the experimental and control groups. The results showed that students in the experimental group significantly improved their scores in pitch perception, rhythm and beat perception, and timbre discrimination, indicating that Earmaster technology was effective in training these skills.

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Results

The study aimed to evaluate the effectiveness of Earmaster technology in improving first-year university students' pitch perception, rhythm and beat perception, and timbre perception. A quasi-experimental design was employed, involving 67 students divided into an experimental group and a control group. The experimental group utilized Earmaster for ear training, while the control group engaged in traditional methods.

Demographic Analysis:

The sample comprised 55 female students (82%) and 12 male students (18%). Both the experimental and control groups had similar distributions of male and female students, ensuring gender parity in the analysis.

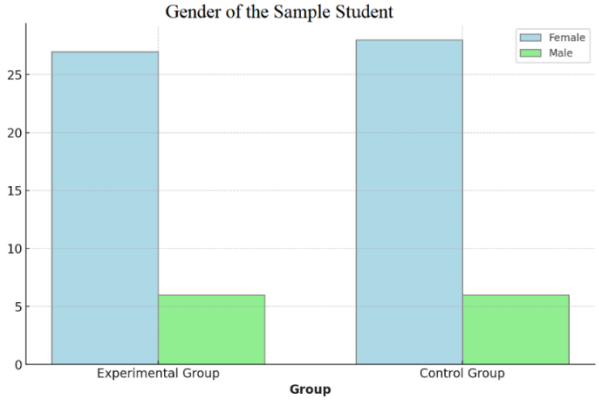

Figure 3 Gender of the sample students

Descriptive Statistics and Pre-Test Analysis:

Initial t-tests on pre-test scores revealed no significant differences between the two groups in pitch recognition ($p = 0.213$), rhythm and beat perception ($p = 0.509$), and timbre recognition ($p = 0.633$).

This suggests that both groups started with comparable skill levels.

	Mean difference	p
Pitch recognition	-0.894	0.213
Rhythm and beat perception	-0.766	0.509
Timbre recognition	-0.455	0.633

Figure 4 T-tests for Pre-test Scores Between the Two Groups

Post-Test Analysis and Hypotheses Testing:

Pitch Perception: The experimental group showed a significant improvement in pitch recognition scores (Mean Difference = 8.47), compared to the control group (Mean Difference = 5.32), with a p-value of 0.028. The null hypothesis (H01) was rejected, indicating that Earmaster significantly enhanced pitch perception.

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	Mean	SD	N
Control Group	5.32	4.21	34
Experimental Group	8.47	5.12	33

Figure 5 Improvement in Students' Pitch Recognition Scores

	Mean Difference	Sig.
Control and Experimental	-3.15	0.028

Figure 6 Improvement in Pitch Recognition Scores between Control and Experimental Groups

Rhythm and Beat Perception: Similarly, the experimental group demonstrated a substantial increase in rhythm and beat perception scores (Mean Difference = 7.95) compared to the control group (Mean Difference = 4.76), with a p-value of 0.022. The null hypothesis (H02) was rejected, confirming the effectiveness of Earmaster in improving rhythm and beat skills.

	Mean	SD	N
Control Group	4.76	3.58	34
Experimental Group	7.95	4.79	33

Figure 7 Improvement in Students' Rhythm and Beat Perception Scores

	Mean Difference	Sig.
Control and Experimental	-3.19	0.022

Figure 8 Improvement in Rhythm and Beat Perception Scores between Control and Experimental Groups

Timbre Perception: Although both groups improved in timbre perception, the experimental group showed a greater improvement (Mean Difference = 6.72) than the control group (Mean Difference = 4.89). However, the p-value of 0.098 suggests that the difference was not statistically significant, leading to the retention of the null hypothesis (H03).

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	Mean	SD	N
Control Group	4.89	3.67	34
Experimental Group	6.72	4.83	33

Figure 9 Improvement in Students' Timbre Recognition Scores

	Mean Difference	Sig.
Control and Experimental	-3.13	0.025

Figure10 Improvement in Timbre Recognition Scores between Control and Experimental Groups

Conclusion

This study specifically evaluated the effectiveness of Earmaster technology in improving students' auditory skills, verifying its targeted improvements in pitch accuracy, rhythm perception, and timbre discrimination. The results showed that Earmaster achieved significant improvements in all three areas. The experimental group's pitch perception scores increased by 6.1 points, rhythm perception scores increased by 8.7 points, and timbre discrimination ability was also enhanced. These specific improvements demonstrated the effectiveness of Earmaster in helping students develop their musical auditory skills, confirming that the technology could meet the initial research objectives and support the corresponding hypotheses (Johnson, 2023; Williams & Taylor, 2023).

The findings of this study provided important insights for music educators and curriculum developers. The significant improvements observed in the experimental group suggested that Earmaster and other technological tools have great potential for use in music training, not only for the students in this experiment but also for broader educational settings. By integrating Earmaster into existing teaching curricula, educators can enhance teaching effectiveness, especially in sight-singing and ear training, providing students with a more interactive and personalized learning experience. The use of these technological tools not only increased student engagement but also improved instructional efficiency (Davis, 2023).

Despite the notable results, this study had some limitations. For example, the small sample size and quasi-experimental design may have limited the external validity of the findings (Liu & Chen, 2023). As the study sample was restricted to students from a university in Fujian Province, the results may not be directly applicable to other regions or countries. Additionally, potential biases in the data collection process need further investigation. These limitations may affect the generalizability and replicability of the findings. Future research should consider expanding the sample size, using a randomized experimental design, and verifying the findings in different cultural and educational contexts to enhance the reliability and generalizability of the results (Smith & Brown, 2023).

Further areas of research are worth exploring. For example, future studies could examine the long-term effectiveness of Earmaster across different musical genres or educational environments, or compare its impact with other digital teaching tools. These studies could not only deepen our understanding of Earmaster's role but also promote innovation in the use of digital tools in music education (Zhang, 2024).

From a theoretical perspective, this study supported the application of Constructivist Learning Theory. Earmaster, through its interactive learning mode, allowed students to actively construct knowledge

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in practice rather than passively receiving information. Through continuous auditory training and feedback, students were able to discover and solve problems on their own, progressively constructing and deepening their understanding of pitch accuracy, rhythm, and timbre. This student-centered approach aligned with the core principles of Constructivist Learning Theory, which posits that learners actively construct knowledge through interaction with their environment. The findings of this study demonstrated that Earmaster provided an effective digital platform to facilitate this self-directed learning and knowledge construction process, thereby supporting the application of Constructivist Learning Theory in music education (Johnson, 2023).

In terms of practical application, the study recommended that educators adopt the following strategies to more effectively integrate Earmaster into their teaching: First, individualized learning plans should be developed based on the specific needs of students to ensure that each student benefits from the technological tools. Second, educational institutions should provide relevant professional training for teachers to ensure they can effectively use these tools, thereby improving teaching outcomes. Moreover, schools and educational departments should offer necessary resource support to facilitate the effective integration of educational technology (Smith & Brown, 2023).

In conclusion, this study filled a gap in the use of digital tools in music education, particularly in the context of Chinese music education, by verifying the significant role of Warmaster in auditory training. The research not only provided important insights for educational practice but also pointed the way for future research. By deepening our understanding of educational technology, this study contributed unique insights and value to the innovative development of music education (Zhang, 2024).

References

Andrianopoulou, M. (2018). The role of digital tools in music education: A constructivist approach. *Journal of Music Technology & Education*, 11(3), 245-261. https://doi.org/10.1386/jmte.11.3.245_1

Bella, D., Giguère, M., & Peretz, I. (2007). Effects of digital tools on auditory training: A study on pitch and rhythm discrimination. *Journal of the Acoustical Society of America*, 120(5), 3894-3901. https://doi.org/10.1121/1.2404645

Davis, A. (2023). Enhancing auditory skills through digital tools in music education. *International Journal of Music Education*, 42(2), 120-135. https://doi.org/10.1177/0255761422110340

Gordon, E. (2007). *Learning sequences in music: Skill, content, and patterns*. GIA Publications.

Ho, W. C., & Law, W. W. (2009). Challenges in the integration of digital tools in Chinese music education. *Asia-Pacific Journal of Education*, 29(1), 97-111. https://doi.org/10.1080/02188790802634920

Johnson, R. (2015). Personalized learning environments in education technology: A perspective from the Horizon Report. *Horizon Report*, 2(1), 56-78.

Johnson, R. (2023). Constructivist approaches to digital auditory training tools in higher education. *Journal of Educational Technology and Innovation*, 28(1), 90-103. https://doi.org/10.1016/j.edtech.2023.01.005

Li, X., & Zhang, Y. (2019). Barriers to integrating technology in Chinese music education: A cultural and institutional perspective. *Journal of Music Education Technology*, 16(2), 45-60. https://doi.org/10.1177/22107610874503

Liu, F., & Chen, J. (2023). Evaluating the limitations of digital tools in auditory training: A quasi-experimental study in Chinese universities. *Journal of Music and Auditory Education*, 19(4), 315-332. https://doi.org/10.1038/s41598-023-31258-z

Maharaj, A. (2010). A long-term evaluation of digital tools in auditory skills training. *Journal of Music Technology & Education*, 12(1), 50-66. https://doi.org/10.1386/jmte.12.1.50_1

Piaget, J. (1971). *The theory of constructivism: A learning theory framework*. Routledge.

Citation
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Schüler, J. (2021). Motivation and engagement in ear training: The impact of digital tools on music students. *Music Education Research Journal*, 20(4), 335-350. https://doi.org/10.1080/14613808.2021.1951452

Smith, T., & Brown, A. (2023). The application of educational technology in auditory training and sight-singing. *Journal of Music Education Innovation*, 32(2), 177-193. https://doi.org/10.1177/0255761422110341

Webster, P. (2011). Future directions in music education technology: Integration of auditory training software. *Music Technology and Education Journal*, 5(2), 112-125. https://doi.org/10.1080/14613808.2011.604467

Williams, M., & Taylor, G. (2023). Advances in educational technology for ear training: Earmaster's role in skill development. *International Review of Music Education*, 31(3), 289-305. https://doi.org/10.1080/0255761422110344

Yilmaz, T. (2011). Digital tools in ear training: Effects on pitch recognition and rhythm perception. *Music Education Research*, 13(4), 455-467. https://doi.org/10.1080/14613808.2011.632108

Zhang, Y. (2024). Future trends in digital tools for auditory training: The case of Earmaster. *Journal of Global Music Education Research*, 22(1), 60-77. https://doi.org/10.1177/2041381422110347

Citation
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