

“Guitar Pro” as Learning Tools in Major Class

Riyan Hidayatullah¹, Prisma Tejapermana², Agung Hero Hernanda³, Chamil Arkhasa Nikko Mazlan⁴, Hasyimkan⁵

^{1,2,3,5}Prodi Pendidikan Musik FKIP Universitas Lampung,
Jl. Prof. Dr. Sumantri Brojonegoro No. 1 Bandar Lampung, Indonesia

⁴Universiti Pendidikan Sultan Idris, Malaysia
Tanjong Malim, Perak Malaysia

(*)✉ (e-mail) riyan.1002@fkip.unila.ac.id¹, prisma.tejapermana@fkip.unila.ac.id²,
agung.hernanda@fkip.unila.ac.id³, chamil@fmsp.upsi.edu.my⁴, hasyimkan1971@fkip.unila.ac.id⁵

Abstrak

Tujuan: Artikel ini bertujuan menjelajahi sejauh mana penggunaan media pembelajaran berbasis teknologi digital dalam pelajaran gitar. Memilih teknik pembelajaran yang tepat dan mempertimbangkan bagaimana setiap komponen bekerja dapat menghasilkan proses pembelajaran yang efektif. Komponen media pembelajaran, misalnya, membantu guru dalam memenuhi kebutuhan siswa dan mendorong partisipasi aktif dari semua siswa. Karakteristik dan tujuan dari lingkungan belajar siswa dapat diatasi dalam materi pembelajaran. Karena pelajaran gitar adalah pelajaran praktik, hasil pembelajaran yang efektif membutuhkan pemanfaatan media yang tepat. Untuk itu, para pengajar menggunakan teknologi digital untuk meningkatkan pembelajaran. Software, program, website, dan media sosial merupakan indikasi dari media teknologi digital. Tujuan pembelajaran gitar sangat menekankan pada repertoar lagu, tarian, dan pengembangan tangga nada. Ketika peserta didik tidak dapat memahami bunyi partitur, irama lagu dan petikan atau pola gitar tidak sesuai dengan interpretasi yang diinginkan oleh komposer, maka pembelajaran memainkan alat musik dengan hanya membaca partitur menjadi kurang ideal. **Metode:** Metode kualitatif diterapkan dalam penelitian ini untuk meneliti implementasi media pembelajaran berbasis program Guitar Pro dan hubungan antara masing-masing variabel, dengan menggunakan tulisan naratif deskriptif untuk menggambarkan kesulitan-kesulitan yang diteliti secara efektif. **Hasil dan Pembahasan:** Efek menguntungkan dari penggunaan program Guitar Pro sebagai media pembelajaran di kelas mayor gitar listrik dapat dirasakan dalam kemampuannya untuk memaksimalkan proses dan hasil pembelajaran. **Kesimpulan:** Media berbasis aplikasi Guitar Pro ini juga dapat digunakan dalam pembelajaran daring sambil menampilkan konten pengajaran gitar, aplikasi Guitar Pro dapat membantu dan membimbing mahasiswa dalam memahami materi.

Kata kunci: Aplikasi, media pembelajaran, pembelajaran gitar, pendidikan musik, Guitar Pro



This work is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).

Copyright © 2024 Riyan Hidayatullah, Prisma Tejapermana, Agung Hero Hernanda, Chamil Arkhasa Nikko Mazlan, Hasyimkan

Proses Artikel

Diterima 19-12-2023; Revisi 20-06-2024; Terbit Online 24-06-2024

Abstract

Purpose: This article aims to explore the extent of the use of digital technology-based learning media in guitar lessons. Selecting the proper learning technique and considering how each component works might end in an effective learning process. The learning media component, for example, assists teachers in meeting the needs of their pupils and encourages active participation from all of them. The characteristics and aims of the student learning environment can be addressed in learning materials. Since the major in guitar lessons is a practical subject, effective learning results need the utilization of appropriate media. For this reason, educators use digital technology to enhance learning. Software, programs, websites, and social media are indications of digital technology media. The learning objectives for guitar strongly emphasize song repertoire, dance, and scale development. While learners cannot comprehend the score's sound, the song's rhythm and the guitar lick or pattern do not match the composer's intended interpretation, making learning to play the instrument by merely reading sheet music less than ideal. The qualitative method was applied in this study to examine the implementation of learning media based on the Guitar Pro program and the link between each variable, using descriptive narrative writing to illustrate the difficulties studied effectively. **Result:** The beneficial effects of using the Guitar Pro program as a learning media in electric guitar majors may be sensed in its ability to maximize learning processes and outcomes. **Conclusion:** This Guitar Pro application-based media can also be used in online learning, such that while showing guitar teaching content, the Guitar Pro app may help and guide students in understanding the material.

Keywords: Application, learning media, guitar learning, music education, Guitar Pro

Introduction

Guitar learning is practical, as is guitar learning in Lampung University's Music Education Study Program's electric guitar class. The guitar is commonly considered a versatile musical instrument, yet learning the guitar at the university level and online will undoubtedly confront some challenges that may limit the efficacy of guitar learning. The guitar can be used as a group and individual learning tool. It can be a nonverbal communication channel to transmit thoughts and sentiments (Hidayatullah & Tejapermana, 2020). The consequences of guitar learning are put on fingerings, scale development, and repertoire—inadequate learning media results in subpar achievement of fundamental competencies. Hidayatullah & Tejapermana continue to report that the learning outcomes of the acoustic guitar class emphasize aspects of dancing, Major natural scales, and primary chords on the guitar. Inappropriate learning strategies cause the achievement of essential competencies to be less than optimal. The adequacy of the level of teaching material is the most critical factor in guitar class learning (Sembiring & Widiastuti, 2018).

Technological improvements and the widespread availability of high-speed internet bring with them technologies and social spaces that contribute to the innovation of guitar pedagogy and the disruption of old approaches to teaching and studying guitar (Rodriguez & Marone, 2021). With the advancement of technology in guitar learning, to this day, brings learners and teachers to problematic challenges. Instrument-specific issues, heterogeneous groups, learning facilities and course structure, and motivation are the four most significant variables in organizing instruction and constructing a blended learning guitar course (Tuisku & Ruokonen, 2017). When watching instructional videos online, students prefer to hold an instrument in their hands; otherwise, they simply watch films without learning. Technology integration into educational settings has become increasingly prevalent in recent years, with the advent of various learning applications (apps) revolutionizing the way students engage with and acquire knowledge. In the context of music education, the use of interactive technologies, such as learning apps, has been explored as a means to enhance the learning experience for students, particularly in the guitar classroom.

Online learning during the pandemic influenced post-pandemic learning behaviours, especially guitar learning. During the pandemic, the Good consequence of online learning is to maximize learning by leveraging digital technology media. Websites, social media, software, and applications are a few instances of digital technology media. For example, using WhatsApp and YouTube technologies may be an alternative to performing an online guitar learning practicum. Each learner can maximize this guitar remote learning with the correct treatment, such as communication and monitoring (Herdiati & Saputra, 2022). Although the nuances of studying guitar during the pandemic do not sufficiently convey the richness of music emanating from the guitar, some individuals continue to believe that this learning cannot be divorced from face-to-face education (Ayyıldız & Zahal, 2023).

Guitar learning in an electric guitar lesson is more effective when learning media is used. Numerous learning media can be used, but not all of them have the potential to meet the criteria of practical learning. According to Ardipal (2020), the use of technology in the learning process, the use of technology in the learning process improves the learning process by increasing involvement, creativity, and critical thinking skills, among other things. In today's world, modern technology-based programs for music learning (including guitar lessons) are a must. The goal of employing learning media is to help teachers deliver messages or subject

matter to students in a way that is more understandable, fascinating, and pleasurable for pupils. The term "media" is frequently used interchangeably with the word "technology," which is derived from the Latin words *tekne* (art) and *logos* (science).

Throughout the pandemic, guitar teachers all over the world are changing their face-to-face, practical classes into online activities with all of the physical constraints. Instead of presenting activities in which their students can search, select, or control the process or information, instrumental teachers design more activities in which they can govern the usage of ICT (Poza et al., 2022). One of the many tools that can be utilized as a medium for teaching guitar classes is Guitar Pro, which is a personal tabulature editor application. However, this program is not directly advised for group guitar lessons. Application-based learning media, such as "guitar pro" can be an alternative that can be used in guitar major classes, because the application is equipped with sheet music and tablature that translates the sound or tone pressed on the guitar fretboard simulation. Furthermore, instructional aids facilitate the teaching of guitar subject by teachers. The purpose of this study was to describe the outcomes of using the application in the electric guitar class at the University of Lampung's Music Education Study Program. These studies also have investigated the potential benefits of incorporating interactive technologies into instrumental music instruction. One such study explored the Music Paint Machine, an interactive system that allows musicians to create digital "paintings" by playing music and making various movements on a coloured pressure mat. The researchers found that integrating this technology into learning led to positive outcomes, such as enhanced student engagement and a more enriched learning experience.

Method

This study aims to evaluate the effectiveness of the Guitar Pro program as an online and offline learning tool for students majoring in electric guitar. We employed a qualitative technique to solve these challenges. This qualitative approach is utilized to examine the deployment of learning media using the Guitar Pro application, as well as the relationship between each variable. The data obtained in this study refers to the steps of qualitative research, the first of which is that the researcher collects data in the electric guitar major course, what media has been used in learning, how effective the use of learning media is, and the second step validates through descriptive narrative writing so that the issues studied can be clearly explained.

Data was also collected by semi-structured interviews with all six students. We examined their practical learning experiences and checked each student's progress in mastering the material and obstacles in learning the guitar. We also used the focus group method (see: Wilkinson, 1998) as a data collection method to complement the previous interviews. This focus group involved all guitar major students, the research team who are all guitar players, and checking the suitability of the literature on the reflection of the latest information obtained.

Results and Discussion

The electric guitar major class is a course provided in the curriculum of the music education study program. There are four levels in this course: electric guitar major instrument I through IV. The 2020 curriculum was utilized for this study, as opposed to the prior curriculum's association of the electric guitar as the major instrument with recital classes, in

which students performed solo pieces in accordance with their major instrument. The recital course is no longer offered in the current 2020 curriculum or use; instead, the solo performance achievement is completed at the conclusion of the Major Instrument IV lecture. With a variety of learning study materials encompassing fingering techniques, picking, scales, modes, and performing instrumental guitar songs from different virtuoso techniques, electric guitar major courses typically carry out practical learning.

Every Friday, the music education study program's music studio serves as the venue for this main lecture on electric guitar. The limited equipment that supports major guitar classes presents an array of implementation challenges, including a lack of amplifiers, the number of electric guitars owned by the campus, the scheduling of studio time that must overlap with other major instrument class schedules, and the requirement that major electric guitar instruction be completed online.

Owing to the limitations in the learning process, electric guitar majors might maximize their learning outside of the classroom by utilizing extra learning resources based on adaptable applications. The Guitar Pro application was selected as the learning medium because it is user-friendly and contains learning tools for the guitar. This application allows students to adjust the playback speed, repeat specific sections, and view tablature and musical notation, all of which can contribute to a more personalized and engaging learning experience.

Media are categorized according to Thomas (in Cahyadi, 2019) on the basis of experience, specifically: (1) Experience from real objects (relief experience), such as a ball. (2) Experience derived from artificial items, such as images and photographs (substitute of relief experience). (3) Experience through words alone, such as those found in books and radio shows. It is thought that the learning process and learning outcomes can be improved if it can stimulate the three levels of media experience. The degree of learning experience with the media offers distinct learning outcomes. Thus, in addition to offering experience with actual objects (relief experience), in this case an electric guitar, we selected learning media based on the guitar pro application in the implementation of learning electric guitar major in the music education study program. Naturally, it can also stimulate other learning media experiences.

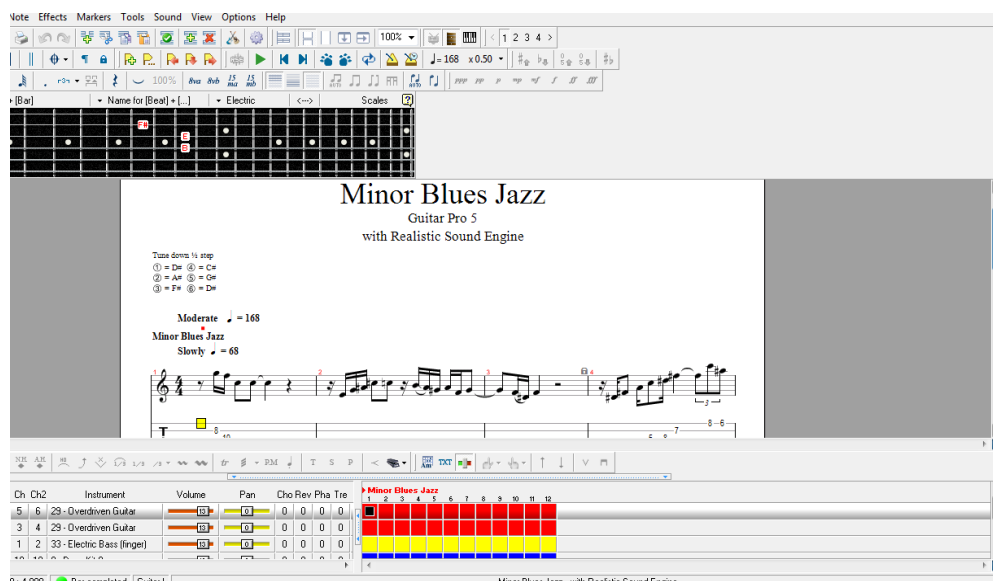


Figure 1. Screen display of one of the course materials in the guitar pro application

According to the screen display of the guitar pro application in the image above, there are many options or tools that can be used to learn electric guitar material, ranging from the display of the position of the fingers on the strings on the fingerboard, the instrument column that you want to display the notation (there are several columns of musical instruments with each notation, if the work consists of several instruments used), to audio that sounds the notation that is being presented, so that students or others studying song material in the application can play the piece more accurately.

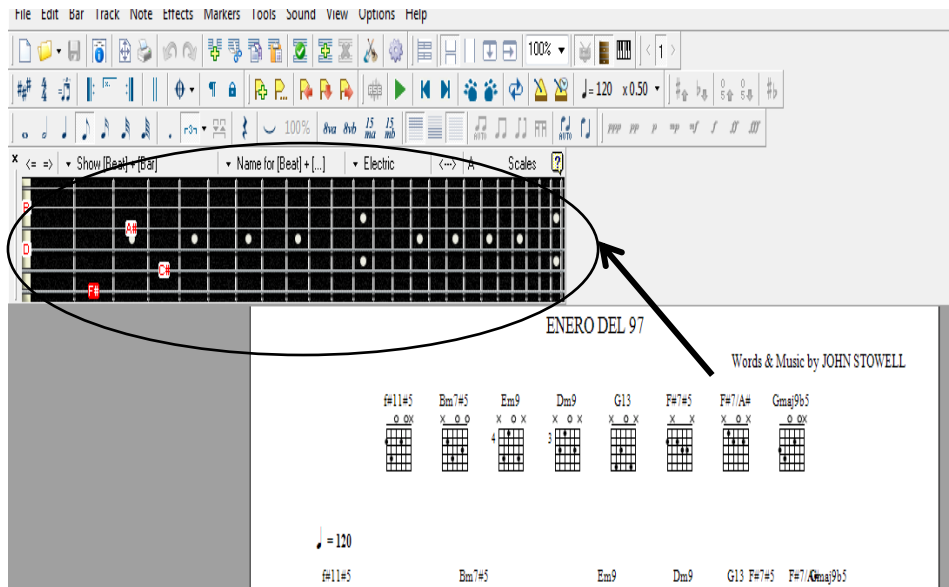


Figure 2. Guitar fretboard view in the guitar pro application

Learning Activities

In the learning process, teachers can more easily explain the material to all students at the same time, no longer frequently showing the position of the fingers on the guitar fretboard to each student in turn, all can focus on one learning resource, and this has an impact on the more effective time used in teaching and learning activities.



Figure 3. Lecturer displays electric guitar practice materials using the “Guitar Pro” (Source: Tejapermana, 2023)

The electric guitar major class consists of six students, each holding their own instrument. The lecturer's first step is to set up facilities and equipment, such as computers. Each student can access a computer where the Guitar Pro application can be installed and run. The lecturer centralizes the usage of laptop computers and projectors for students (Figure 3). This device assists lecturers in guiding pupils; projectors or interactive panels can be utilized to display Guitar Pro displays on a big scale. The internet connection is the next thing to set up. Although Guitar Pro can be downloaded and run without an online connection, it may be necessary to connect to the internet to receive content updates or file sharing. One of the most critical aspects of this major class is student engagement. They do so because they prepare their materials. Students may be expected to create their lesson materials, such as melodies or songs to be learned, and import them into Guitar Pro. The teacher, on the other hand, develops course materials for daily practice. Furthermore, Guitar Pro can enhance group collaboration by allowing students to share projects or songs they create and study. Another key feature is that students can share Guitar Pro project files and provide comments to one another on playing techniques, notation, and musical interpretation.



Figure 4. Transcription of guitar notation and tablature on worksheets (Source: Tejapermana, 2023)

The Guitar Pro app assists guitar teachers (such as Prisma Tejapermana, a lecturer) in transcribing music notation through compositions or daily practice etudes. Students can view music notation and tabulation on their screens via cellphones and projectors, but others prefer a paper version of their notation (Figure 4). The program lets students comprehend how to perform a melody or song. During in-class practice, students play the song or melody using Guitar Pro's audio playback tool to hear how the piece should be played. The Guitar Pro software can be used to evaluate student progress, monitor mastered parts, and identify areas for growth. Guitar Pro also supports additional instruments, such as bass and string instruments, allowing students to learn how multiple parts interact within a composition. The lecturer gives course materials such as fingerings, reading notation, picking techniques, ensemble, accompanying, improvising, developing melodies, playing compositions, and performing arrangements during practice. The lecturer uses this set of materials to try to influence the playing patterns of each individual based on their features. Although the students' development is minimal, this practice pattern can prepare students to teach. Individual guitar talents have formed through several learning patterns and phases.

Discussion

Using Guitar Pro media facilitates an engaging, application-based learning experience for students. Students who require assistance while practising alone in their rooms predominantly depend on this application rather than merely relying on audio data from platforms such as YouTube and Spotify. This application offers high accessibility due to its interactive and flexible interface, which permits students to access learning materials anytime and anywhere. This feature significantly supports autonomous learning and the revision of materials beyond classroom hours. Additionally, Guitar Pro enhances students' ability to

visualize sheet music through digital music notation, simplifying the comprehension of musical structures and playing techniques.

Although the Guitar Pro application appears polished and sophisticated, its usage presents several challenges. Students' technological literacy, often regarded as digital natives, does not necessarily translate into an optimal utilization of the application for independent learning outside the classroom. In reality, many students exhibit a preference for traditional methods. For instance, students tend to favour audio banks or backing tracks on platforms like YouTube during improvisation exercises, owing to their simplicity and ease of use. These platforms require no intricate setup processes, unlike the more complex software accessible on laptops. Despite the availability of mobile applications, students often revert to YouTube due to considerations such as the significant storage space required by smartphone applications.

Self-regulation and Learning Ethics

In the context of music education, the application of Guitar Pro and other advanced technologies is not without its constraints, potentially impeding students' creative capacities. According to (Bond, 2002), despite the interactive and comprehensive nature of app-based music instruction, students' academic performance tends to be significantly lower than that achieved through face-to-face learning. This discrepancy is especially evident among students hailing from low-literacy backgrounds. Music education is intrinsically linked to the physical classroom environment. For example, while solfeggio lessons may be adapted for remote instruction, the unique interactive experience afforded by in-person classroom settings remains unparalleled (see: Ouyang, 2023). Music education encompasses more than merely students' engagement with media applications; it also requires addressing the specific learning objectives set by the lecturer. Technology is not only used as a medium for learning music but is combined and utilized to strengthen learning strategies and approaches that emphasize the learner (Peretti et al., 2024).

In guitar classes, where the primary objective is to achieve technical mastery and high performance, it becomes evident that not all students possess standardized skills, particularly in self-regulation, in managing material and appropriate time or duration for their learning. When lecturers hold high expectations for students, it often results in students needing help to meet these standards. Despite lecturers structuring materials to foster independent learning, students must frequently demonstrate above-average techniques or skills. Guitar lessons inherently incorporate music theory, which may only sometimes be apparent to students. In addition, besides emphasizing the use of media applications in music classes, enhancing the intrinsic qualities of music education, such as making the subject matter meaningful to students, is a crucial aspect for educators to consider (see: Abrahams, 2024).

The various instructional components, including tuning, note reading, tuning techniques, ensemble playing, accompanying, improvisation, melody development, playing compositions, and performing arrangements during practices, nearly all need to achieve the course objectives. The primary cause is not the application but the systemic frameworks guiding student learning. From a pedagogical perspective, a negotiation with student self-regulation is necessary between the substantive musical material and the technological skills required to master musical applications. As employed in certain institutions, standardised course materials can only sometimes be effectively replicated and adapted by students. This

circumstance reveals the implementation of the Guitar Pro application, which monitors the extent of student interaction with the application, the degree to which it aids them, and how they negotiate with the provided instructions. Lecturers and students must achieve a balance between teaching techniques and ethical standards. While it is crucial to challenge students and encourage them to reach their full potential, lecturers should avoid setting unrealistic goals or applying too much pressure. This balance prioritizes students' well-being and mental health, resulting in a positive and sustainable learning experience. Along with understanding the value of ethical instruction, addressing any ethical issues that may arise in guitar education is critical. By proactively addressing these issues, educators may foster an environment that encourages ethical behaviour and empowers students.

Collective guitar learning focuses on application and student self-regulation, in which students select their self-practice process outside of class. Furthermore, lecturers should consider establishing virtual communities outside of face-to-face learning, as students spend more time outside of class or with their particular study groups. It is critical to note that in music education, the usage of this type of application continues after a set of written or verbal directions. Zorzal & Soares-Quadros Jr. (2021) also emphasized the importance of verbal teaching in a guitar class. The lecturer's primary objective, however, is to provide a self-learning system that encourages each student to conduct his or her practice with the material supplied.

Ethical behaviour should be promoted in guitar instruction to create a supportive and inclusive learning environment. An ethical learning environment respects and celebrates diversity. Instructors should create a safe space where students from all backgrounds feel included and valued (Hidayatullah, 2023). Emphasizing the importance of mutual respect and empathy helps foster a culture of inclusivity and understanding. Most students who enrol at the University of Lampung, particularly in the music education department, come from non-music literacy backgrounds and want to expand their musical knowledge and talents. Unlike students at music universities, they must compromise on the material supplied, especially at certain levels. Considering this challenge, lecturers should consider developing an inclusive classroom where the course material is customized based on the student's experiences.

Music learning should consider personalized online and face-to-face instruction, especially those integrating technology (Zhou, 2023). Moreover, it is essential to investigate alternative methodologies in online music education (such as learning through applications, videos, etc.) to evaluate their efficacy in music pedagogy and to discern the respective advantages and disadvantages of each approach. However, guitar classes still emphasize the practice of techniques, so any sophisticated application does not replace the role of teachers or lecturers in managing the material, system, process, and evaluation of learning. Application-based or digital learning media is only sometimes beneficial, sometimes even creating new problems due to a lack of literacy about the tool. Lecturers must have skills that are one step ahead if they want to apply any application in music learning without technical constraints.

Conclusion

The instructional medium utilized to optimize the accomplishment of these learning outcomes should be simple for teachers and students to understand. Inappropriate learning media selection will block the learning process, preventing the anticipated learning results from being achieved appropriately. Learning guitar as an ensemble is a fun experience for students while emphasizing that they must be perfectly balanced in playing the melody to get the clearest harmony.

Guitar training using digital media allows students to access instructional materials at any time and from any location, giving them significant flexibility. Apps, online platforms, and digital tools can assist students in learning to play the guitar in various interactive and engaging styles and ways. However, using Guitar Pro applications with primary learners has limitations, such as students needing to be more reliant on digital devices, remembering basic skills, and diminishing direct engagement with lecturers, which can limit individualized feedback and support. Digital guitar learning necessitates a high level of discipline because students must be self-sufficient in arranging and managing their study time. Some digital apps and services may demand a monthly cost, and accessibility may be a barrier, particularly for individuals without easy access to gadgets or the internet.

Learners have frequently utilized this application to improve their guitar skills. This application may be used to not only read sheet music or tablature of guitar compositions while listening to the audio, but it can also be used to produce musical works in the form of tablature or sheet music. As a result, this application is ideal for use as a learning medium in a music education study program's electric guitar major classroom. The incorporation of digital media in guitar learning has the potential to improve accessibility and teaching quality significantly. However, balancing these benefits with fundamental parts of music learning, such as hands-on contact and basic techniques abilities, is critical. Guitar learning through digital media can provide a more holistic and fulfilling learning experience by understanding and fixing flaws.

References

- Abrahams, F. (2024). Idea Bank: Placing the Music at the Center of Music Theory Courses. *Music Educators Journal*, 110(3), 16–19. <https://doi.org/10.1177/00274321241238750>
- Ardipal, A. (2020). Pemanfaatan perangkat teknologi dalam pembelajaran musik berbasis tematik sebagai peningkatan keterampilan abad 21 bagi guru Sekolah Dasar. *Musikolastika: Jurnal Pertunjukan Dan Pendidikan Musik*, 2(2), Article 2. <https://doi.org/10.24036/musikolastika.v2i2.47>
- Ayyıldız, E. B., & Zahal, O. (2023). Instructor experiences with online guitar lessons during the Covid-19 pandemic in Turkey. *International Journal of Music Education*, 41(3), 484–496. <https://doi.org/10.1177/02557614221123078>
- Bond, A. (2002). Learning music online an accessible learning program for isolated students. Australian National Training Authority.
- Cahyadi, A. (2019). Pengembangan media dan sumber belajar: Teori dan prosedur. Laksita.

- Herdiati, D., & Saputra, D. N. (2022). *Online guitar training to increase teacher's managing practicum skills in the 21st century education*. 273–284. https://doi.org/10.2991/978-2-494069-67-1_30
- Hidayatullah, R. (2023). *Pembelajaran musik secara daring*. Penerbit BRIN. <https://penerbit.brin.go.id/press/catalog/view/595/788/18828>
- Hidayatullah, R., & Tejapermana, P. (2020). Kelas gitar akustik berbasis pembelajaran kooperatif. *Gondang: Jurnal Seni dan Budaya*, 4(2), 137–143. <https://doi.org/10.24114/gondang.v4i2.18676>
- Ouyang, M. (2023). Employing mobile learning in music education. *Education and Information Technologies*, 28(5), 5241–5257. <https://doi.org/10.1007/s10639-022-11353-5>
- Peretti, S., Caruso, F., Pino, M. C., Giancola, M., D'Amico, S., & Di Mascio, T. (2024). The CrazySquare project for music learning in Italian school-age pre-adolescents: Integrating technology into educational practice. *Journal of Computers in Education*. <https://doi.org/10.1007/s40692-024-00320-3>
- Pozo, J. I., Pérez Echeverría, M.-P., Casas-Mas, A., López-Íñiguez, G., Cabellos, B., Méndez, E., Torrado, J. A., & Baño, L. (2022). Teaching and learning musical instruments through ICT: The impact of the COVID-19 pandemic lockdown. *Heliyon*, 8(1), e08761. <https://doi.org/10.1016/j.heliyon.2022.e08761>
- Rodriguez, R. C., & Marone, V. (2021). Guitar learning, pedagogy, and technology: A historical outline. *Social Sciences and Education Research Review*, 8(2), 9–27.
- Sembiring, A. S., & Widiastuti, U. (2018). Analisis bahan ajar instrumen gitar persiapan program studi pendidikan musik Universitas Negeri Medan. *Gondang: Jurnal Seni dan Budaya*, 2(1), 1–8. <https://doi.org/10.24114/gondang.v2i1.9761>
- Tuisku, V., & Ruokonen, I. (2017). Toward a blended learning model of teaching guitar as part of primary teacher training curriculum. *The European Journal of Social & Behavioural Sciences*, 20(3), 274–293. <https://doi.org/10.15405/ejsbs.222>
- Wilkinson, S. (1998). Focus group methodology: A review. *International Journal of Social Research Methodology*, 1(3), 181–203. <https://doi.org/10.1080/13645579.1998.10846874>
- Zhou, Y. (2023). Web-based music learning environment. *Interactive Learning Environments*, 0(0), 1–13. <https://doi.org/10.1080/10494820.2023.2185640>
- Zorzal, R. C., & Soares-Quadros Jr., J. F. (2021). 'Taste the value of each note': Verbal teaching strategies in guitar masterclasses. *Music Education Research*, 23(4), 498–511. <https://doi.org/10.1080/14613808.2021.1949271>