



Integrating Tradition and Technology: Digital Audio Workstation-Based Learning for Traditional Music Preservation

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Abstract: Integrating technology into traditional music education presents new opportunities for preservation and creativity. This study examines the application of Digital Audio Workstations (DAWs) as an educational instrument for instructing and conserving traditional music, specifically within the setting of Cisaat Village, Subang, West Java. The study involved 25 young participants from the village, aiming to evaluate how DAW-based learning could enhance their engagement with traditional Sundanese music. The study illustrates how DAWs connect old musical traditions with contemporary digital approaches through workshops and instructional activities, allowing kids to engage with traditional music in more innovative and accessible manners. The research conducted used a type of qualitative research with a descriptive approach. The data collection techniques are observation, interviews, and literature studies. The research adopted Miles and Huberman's analysis approach, including data collection, reduction, presentation, and conclusions. The results indicate that DAW-based learning cultivates creativity, increases student engagement, and facilitates a profound comprehension of musical legacy among younger generations. This technique facilitates the recording, adaptation, and widespread dissemination of traditional music, thus assuring its preservation in the digital era. The study indicates that integrating tradition and technology via Digital Audio Workstations (DAWs) signifies a viable avenue for the future of music instruction and preservation, especially in rural regions.

Keywords: Traditional Music; Digital Audio Workstation (Daw); Music Preservation; Technology; Cultural Heritage



1. Introduction

Integrating technology with traditional music presents a challenge for scholars and musicians in the contemporary era (Waddell & Williamon, 2019; Born, 2010). Technology might serve as a lethal threat (Asogwa, 2020) to traditional music, or conversely, it can rejuvenate its presence in the contemporary period. Researchers are focusing on traditional music in Cisaat Village, Subang, West Java, to devise new strategies for addressing cultural preservation issues in the context of contemporary technology.

Cisaat Village is a locality that preserves traditional arts, particularly in the form of music, including gamelan Degung and Gemyung. Although both musical forms are uncommon in the West Java region, the villagers of Cisaat continue to present traditional music during various local festivities. Initial findings indicated that those over 50 predominantly utilized most music players. Simultaneously, youngsters and adolescents were absent from engaging in play or artistic expression. This trend prompted the researcher to conduct a study to foster interest and skills among school-age teenagers to preserve traditional music.

The significance of maintaining traditional music is not just in its musical merit but also as a cornerstone that fortifies local identity. Traditional music encompasses sounds and melodies, narratives, and profound significances embodying history and regional wisdom (Ogli, 2023; Gunara et al., 2022). In an age of fast technological advancement, preserving traditional music is a primary difficulty (Dellavani et al., 2023). This research examines using a Digital Audio Workstation (DAW) as a novel music education approach in Cisaat Village. Using Audio Workstations (DAWs) as contemporary technical instruments is a strategy that can enhance the maintenance and presentation of musical content in a more engaging and developmentally suitable manner.

Cisaat village is an exemplary study site since it encapsulates the intricate issues rural people encounter in preserving their cultural legacy. The primary obstacles confronting traditional music educators in this hamlet are constrained resources and an absence of adaptable teaching methodologies. We anticipate incorporating DAW will yield beneficial transformations by creating new opportunities and revitalizing pedagogical methods.

The advantages of utilizing a DAWs extend beyond its capacity to record and edit music (Pendergast, 2021; Walzer, 2020); it also offers a more participatory and exciting educational experience for adolescents in Cisaat Village. Digital Audio Workstations (DAWs) serve as a conduit between contemporary technology and the heritage of traditional music, fostering links between historical and current contexts. Acquiring

traditional music in Cisaat Village via DAW is anticipated to be a pivotal advancement in adapting to contemporary changes, allowing the next generation to uphold cultural preservation.

Furthermore, it is essential to recognize that the introduction of DAW in Cisaat Village has not only transformed music education but also had considerable societal repercussions. By promoting the active engagement of the youth, DAW can enhance the capability to influence the village's cultural landscape, foster the development of local culture, and cultivate a profound understanding of musical proficiency. The efficacy of DAW-based conventional music education can serve as the basis for creating a sustainable learning strategy. This methodology imparts musical abilities, enhances cultural comprehension, and equips individuals with valuable technology competencies.

This research advances educational growth by offering a novel approach to traditional music instruction. This research integrates tradition with technology to provide the potential for developing relevant and stimulating learning approaches, therefore expanding the possibilities for music education in Indonesia. This research is a strategic initiative to ensure the sustainability and adaptation of traditional music in Cisaat Village in response to the difficulties of cultural preservation in the digital age. It connects tradition with contemporary society. This research provides insights into the function of technology in traditional music education, making it pertinent to the local community and serving as an inspirational model for analogous difficulties in other regions of Indonesia.

2. Literature Review

This state-of-the-art research is derived from several relevant previous studies used as references. This step is carried out to find novelty in the study. The reviewed research data will then be used as a reference and comparison when conducting this research. Bartolome and Steffe's (2018) research indicated that integrating technology can enhance students' conceptual comprehension, performance abilities, and students' interest. The study revealed that interactive music education applications effectively stimulated students' interest in more active musical exploration. The research suggests that when utilized appropriately, technology may serve as an innovative educational instrument and facilitate students' advancement in music learning. Liu's (2022) research underscores the significance of technology, particularly Digital Audio Workstations (DAWs), in enhancing student creativity and enriching the educational experience. The findings indicated that students utilizing DAWs in music education were more inclined to experiment with musical aspects and exhibited enhanced

creative expression. Technology enhances music education and fosters the development of students' particular abilities and distinctiveness.

Amin's (2018) research emphasizes the problems of technology application in rural areas, particularly with accessibility and assistance in villages. The research finds infrastructural limitations and resource accessibility as critical variables influencing the efficient utilization of technology in rural regions. This study broadens the understanding of the social and infrastructural factors that might affect the efficacy of music education technology deployment in rural settings like Cisaat Village. Recent research by Utami (2023) examined community attitudes regarding utilizing Digital Audio Workstations (DAWs) in traditional music instruction within Cisaat Village.

This study offers a comprehensive perspective on the valuation of technology integration by the local community, enhancing the discourse on community acceptance of advances in conventional music education. Traditional music education has an essential role in maintaining and passing on the cultural wealth of a society. Kartomi (2008) emphasizes that traditional music education involves teaching musical skills and is a medium for transmitting cultural and historical values through melody and rhythm. In particular, traditional music education in Indonesia has a strategic role in preserving cultural diversity. Research by Susanto (2019) highlights the importance of participatory traditional music education to ensure a deep understanding and sustainability of cultural heritage. A study by Chang (2019) showed that conventional music effectiveness learning is enhanced by hands-on experience and active participation of students, which can improve understanding and appreciation of traditional music. Higgins (2012) highlights the importance of hands-on experience in exploring traditional music heritage. The study by Hapsari et al. (2020) further evaluates the positive impact of applying technology, particularly DAWs, in facilitating more thorough and creative learning.

Digital Audio Workstations (DAWs) have been a significant innovation in music education. According to Campbell (2018), DAWs allow students to create, record, and edit music more interactively and thoroughly. This approach modernizes traditional music education by integrating it with digital tools. Recent research by Smith (2021) emphasizes that DAWs can enhance students' technological prowess and facilitate personalized and adaptive learning.

The application of technology in music education, especially in rural environments, often faces various obstacles. Jukes (2006) states that limited technological infrastructure and a community's understanding of modern tools can be significant barriers.. Research by Amin (2018) adds a new dimension by highlighting

challenges related to accessibility and support for technology in villages, providing insights into factors that must be considered when using technology in rural environments. Understanding community perceptions of DAW integration in traditional music preservation efforts is crucial. The study by Anderson (2015) shows that community acceptance of technology in culture can affect the success of its implementation. Recent research by Utami (2023) investigating community perceptions of DAW use in traditional music education in Cisaat Village provides a broader view and is relevant to this study.

Richard M. Steers (1975) states that effectiveness is an activity that measures how much a group or organization achieves a predetermined goal. This theory uses several indicators to measure effectiveness: goal achievement, integration, and adaptation. This study aims to evaluate the effectiveness of learning traditional music using digital audio workstations in addressing the mentioned challenges. According to Hidayat (2006), effectiveness can be measured as an indicator of the extent to which target achievement (quality, quantity, and timeliness) has been achieved. The ability to be effective is related to the success in completing all tasks and achieving goals within the specified time, which involves active contributions from related parties to achieve results that reflect suitability. Effectiveness can also be interpreted as a parameter that shows the extent to which goals can be achieved through the efforts made by comparing the results obtained with the implementation of all obligations and responsibilities. The greater the achievement, the higher the level of effectiveness achieved. Effectiveness can be used to evaluate the extent to which the company carries out its roles and responsibilities according to its position and obligations to achieve the goals that have been set.

Albert Bandura (1977) states that learning involves observation, imitation, and modelling. The learning process is influenced by attention, motivation, attitude, and emotion. Learning occurs when a person observes the consequences of another person's behaviour. Bandura's theory goes beyond the boundaries of behavioural theory, which assumes that all behaviour is learned through conditioning, and cognitive theory, which considers psychological influences such as attention and memory (Overskeid, 2018). According to Vygotsky's theory (1987), several aspects need to be considered in the learning process, namely: (a) Students have greater freedom to acquire knowledge from their zone of proximal development, or potential, through the process of learning and development, (b) Students' potential development level has a more significant relationship with the learning process than their actual development, (c) The use of learning strategies should be directed at strengthening students' instrumental abilities (Bramantyo & Sigro, 2021), (d) Students should be given as many opportunities as possible to integrate the declarative

knowledge gained to solve problems, and (e) The teaching and learning process should be more constructive than just knowledge transfer.

During (2005) says that traditional music is a transmission process intended to perpetuate values, ideas, and forms of organization in a coherent system, often found in small and local cultures. Traditional music, according to Tarnawska-Kaczorowska (1998), is a musical work as a repository of the past, involving different types of music in music, music about music, and different types of musical excerpts. According to Shelemay (1996), traditional music is how music is communicated over time in a particular environment, involving interpersonal dynamics and communication technology. McKean, T. (2003) adds that conventional music is communication, passing social culture through shared practices and knowledge, and expressing solid emotional ties between the performer and the source. Walzer, D. (2020) says that Digital Audio Workstations are software and virtual instruments musicians use to record and make music and help teach signal flow, acoustics, and sound synthesis concepts. Bianchi et al. (2020) added that a Digital Audio Workstation (DAW) is hardware and software that facilitates the operations required for music production, such as arranging, recording, editing, mixing, and creatively modifying sound. According to Whiting et al. (2014), Digital audio workstations are free software that provides direct instruction to students on synthesis, allowing them to manipulate variables to create realistic sounds. Govindan & Anderson (1991) Digital Audio Workstation (DAW) is a continuous media application that handles data quickly and has strict timing requirements. In addition, DAWs are digital audio workstation software displaying audio tracks through waveforms but more expressive and goal-oriented visualizations (Gohlke et al., 2010).

3. Methods

The research conducted used a type of qualitative research with a descriptive approach. This research was conducted to determine the effectiveness of DAW-based traditional music learning in Cisaat Village. The research was conducted in Cisaat Village, Subang, West Java, from February to October 2024. This study's subjects are teenagers in the school-age range in Cisaat Village. Researchers will conduct research by teaching the subjects and then applying traditional music learning using DAW to see and determine the effectiveness of traditional music learning. To obtain data in this study, the data collection techniques used are observation, interviews, and literature studies.

Observation is carried out to obtain an overview of the case phenomena and symptoms observed as the primary data source material in the research. The

researcher actively participated in the learning process of DAW-based traditional music. Participatory observation was used to document the interaction between instructors and participants, the dynamics of technology utilization, and participants' reactions to this educational approach. The acquired data comprised field notes on the learning environment encountered hurdles and participants' adaptability to using DAW.

Interviews were conducted to obtain factual data from sources, which would later be analyzed and used to support the data. Semi-structured interviews were performed with participants chosen for their active engagement in the training program. The interviews sought to investigate their experiences learning traditional music using DAWs, their perspectives on the technology's advantages, and the challenges encountered during the learning process. Furthermore, interviews were held with teachers and community leaders engaged in the program to provide a more comprehensive viewpoint.

The last data collection was carried out with literature studies to obtain references to research materials, search for and find opportunities for research gaps, and support research data. The researcher performed a literature review to substantiate the analysis by examining books, journals, and prior studies pertinent to traditional music education, educational technology, and the application of DAW within traditional music contexts. It was executed to establish a robust theoretical basis for the investigation.

Data analysis is the process of systematically searching for and compiling data obtained from interviews, observations, and documentation. This involves organizing the data into categories, breaking it down into smaller units, synthesizing the findings, and compiling them into patterns. Analysts then select what is essential for study and draw conclusions to ensure the information is easily understood by themselves and others. The analysis was carried out and adopted by Miles and Huberman, and the process included data collection, data reduction, data presentation, and conclusion drawing (Miles & Huberman, 1984). The following is an overview of the analysis by Miles and Huberman (1984). The data were subjected to qualitative analysis via a theme analysis methodology. The analytical procedure was executed in steps, beginning with the researcher doing a coding analysis. Data from observations, interviews, and documentation were systematically coded to discern significant patterns formed during the learning process. The primary topics pertinent to the research emphasis, including technology utilization, response to DAW, and preservation of traditional music, were discerned from the coded data. The organized data was analyzed within the context of the theoretical framework employed and compared with the findings of pertinent prior research.

4. Results

This research was conducted in Cisaat Village, Subang, West Java, an area distinguished for its rich cultural manifestations and robust musical legacy, especially within the Sundanese culture. The community's commitment to safeguarding traditional music, such as Degung, Kacapi, Angklung, and Gembyung, signifies a cultural identity that esteems music as a vital component of social existence and heritage. In Cisaat, music serves not merely as an art form but as a conduit for cultural identity, connecting generations through distinctive sounds and rhythms inherent to West Java.

Before incorporating Digital Audio Workstation (DAW)-based learning, music education in this group primarily focused on traditional techniques. Educators were essential in transmitting musical information through direct, experiential training encompassing listening, imitation, and practical application. This conventional approach prioritized auditory involvement, enabling students to comprehend the technical elements and the cultural significance inherent in each musical composition. In these private, practice-focused sessions, instructors preserved traditional Sundanese music's authenticity and emotional depth.

Figure 1. Students Learning DAW-Based Tradition Music (source: Dani Nur Saputra, 2024)



The research participants in these educational sessions were teenagers from the hamlet, motivated by a need to comprehend and master their community's traditional

instruments. Their passion was apparent in their determination to study, especially as these young learners perceived music not merely as a skill to be mastered but as an essential link to their past. The emergence of DAW-based learning has recently started transforming music education in Cisaat. Integrating technology with conventional learning has created new opportunities for participation, potentially improving accessibility and cultivating a deeper, more varied enjoyment of Sundanese music among the youth.

During the preliminary phase of DAW adoption, comprehensive training was administered to conventional music educators and participants to facilitate their comprehension of DAW software utilization. Throughout the investigation, the teachers began to include Digital Audio Workstations (DAW) into the classes by recording, manipulating, and altering sounds from conventional musical instruments. Consequently, learners might more readily comprehend musical structures, enhance their compositions, and investigate sound variations that are not attainable through traditional learning techniques.

Figure 2. Digital Audio Workstation Implementation in Traditional Music
(source: Dani Nur Saputra, 2024)



An evaluation was performed using pretest and post-test measures to determine the enhancement of participants' comprehension and proficiency in traditional music performance following the implementation of DAW. The data analysis results substantially enhanced the participants' technical abilities and inventiveness.

Participants improved their skills in conventional music and showed the ability to create new compositions using the features of the DAW.

Integrating Digital Audio Workstation (DAW) technology into traditional music teaching in Cisaat Village yielded positive results; however, several challenges emerged during its implementation. A significant impediment was restricted access to crucial gear and software, as Digital Audio Workstation configurations sometimes necessitate computers, audio interfaces, and specialist software that entail substantial expenses. The financial obstacle was considerable since numerous individuals in the hamlet Needed help to buy these resources, hindering the comprehensive implementation of the DAW strategy among all student groups. Consequently, access to digital music education resources was frequently limited to individuals who could buy the necessary equipment or rely on community assistance, which, although beneficial, could have been more consistently adequate.

Figure 3. Traditional Music Instructor Applying DAW Technology (source: Dani Nur Saputra, 2024)



Alongside the cost obstacle, several participants, especially elderly ones, encountered challenges in acclimating to the new digital tools. The issues sometimes originated from insufficient prior exposure to digital technologies, complicating the move from conventional, hands-on learning to a technology-driven method. For specific older learners and instructors, interfacing with software and handling digital audio files appeared unfamiliar, resulting in a learning curve that was first

demotivating. Despite Organizing workshops and training sessions to address this gap, insufficient resources for comprehensive training presented an additional obstacle.

The interplay of financial limitations and technological unfamiliarity underscored the necessity for a more supportive structure to facilitate DAW integration in Cisaat. Although younger learners acclimated to the technology swiftly, the community's experience Shows that implementing digital technologies necessitates both a financial commitment and a gradual, resource-intensive training approach. Meeting these demands could allow DAW technology to enhance traditional approaches, expand access, and potentially improve music instruction for all age groups within the community.

5. Discussions

Implementing a Digital Audio Workstation (DAW) in Traditional music education in Cisaat Village has demonstrated notable enhancements in students' comprehension and abilities. Using DAW enables students to comprehend traditional music's structure while facilitating direct experimentation with musical aspects, like tempo alterations, harmony, and sound dynamics. Utilizing a DAW, students may record and playback their musical performances, facilitating reflection and enhancement that were challenging to achieve through traditional learning techniques. Technology is an effective instrument in music education, linking theory with practice via an interactive methodology.

Digital Audio Workstations facilitate individualized learning, enabling student to progress in their skills according to their unique manner. Students who comprehend the content more rapidly can investigate advanced functionalities in the DAW, such as mixing and mastering. Meanwhile, those who need more time can focus on mastering the fundamentals of digital musical instruments. They foster an inclusive and flexible learning environment, enabling students to grow according to their abilities. Studies by Campbell (2018) and Smith et al. (2021) corroborate similar findings, indicating that technology like DAWs can surmount the constraints of conventional learning approaches and provide enhanced access to diverse musical experiences.

The efficacy of DAWs is contingent upon the instructor's capacity to incorporate this technology into the educational process. Comprehensive training for teachers is crucial to enable them to assist pupils in utilizing DAWs proficiently. Instructors must elucidate digital principles in traditional music and illustrate the application of technology to facilitate the attainment of learning objectives. Inadequate comprehension from professors may hinder the optimal utilization of DAWs, leaving pupils involved in the technology's intricacies without appropriate supervision.

Parental and community engagement in this technology-driven educational process is equally significant. Parents' informed comprehension of the advantages of DAW helps foster a more conducive learning atmosphere at home. Engaged parents may enhance children's access to essential technologies and bolster their autonomous practice beyond the classroom. Consequently, training and socialization programs must incorporate parents and communities to improve their capacity to support student learning efficiently.

Using DAWs in conventional music education improves learning efficacy and has significant implications for preserving traditional music. In this context, DAWs offer the means to record and preserve traditional music in a digital format that is readily accessible and distributable. The digital recording and storing procedure is the precise preservation of classic musical compositions and genres, ensuring their accessibility for future generations. It is essential for protecting cultural artefacts frequently endangered by globalization (Muhtar et al., 2024) and swift societal transformation.

Moreover, DAWs facilitate traditional music's adaptation and innovation, attracting the younger generation. Utilizing the innovative capabilities of DAWs, students may generate novel interpretations of classical music that resonate better with modern musical preferences while preserving the original cultural integrity. DAWs facilitate the regeneration of traditional music, ensuring its preservation while allowing it to grow and adapt to contemporary contexts. Utami et al. (2023) indicate that this form of innovation may preserve the significance of traditional culture in modern society. Nonetheless, there is apprehension that utilizing technology, such as Digital Audio Workstations (DAWs), may alter or eradicate the intrinsic qualities of traditional music. In this instance, educators must achieve a balance between a balance between innovation and preservation. A balanced approach can be achieved by maintaining the fundamental aspects of traditional music while permitting creative expression. Educators must teach children the significance of preserving cultural integrity while fostering creative development.

The efficacy of DAWs in preserving traditional music is contingent upon community acceptance and support. Communities that advocate for technology in cultural preservation can actively participate by capturing performances or supporting new works created with digital audio workstations (DAWs). They foster a dynamic ecology in which traditional music persists and flourishes more extensively.

The use of DAWs in a rural setting like Cisaat Village presents several challenges. A primary impediment is the inadequate technical infrastructure. Numerous rural regions continue to have challenges with reliable, high-speed internet connectivity and insufficient hardware resources. These constraints can impede the learning

process and render the utilization of DAWs less than optimal. This study revealed that some participants had challenges obtaining the requisite technical instruments, diminishing the efficacy of DAW utilization.

Alongside infrastructural constraints, problems exist related to adopting and adapting new technologies, particularly among older participants or those less acquainted with digital advancements. Participants need help comprehending and utilizing DAWs, resulting in frustration and diminished willingness to learn. This issue is sometimes exacerbated by insufficient assistance or expertise to bridge the technological divide. Amin et al. (2018) assert that continuous training and a customized approach to participants' requirements are essential for effective technology deployment in rural settings.

Many strategies may be employed to address these issues. Enhancing technological infrastructure in rural regions by improving internet accessibility and supplying requisite gear is essential. The government and corporate sector can partner to improve access to technology and offer subsidies or support to underserved populations. This approach will enhance conventional music instruction while expanding chances in digital education and skills development in remote regions.

Secondly, participants and teachers should receive a continuous and tailored training program. This session will include the fundamentals of utilizing a DAW and its integration with conventional music education. An engaging and practical approach to learning can alleviate frustration and enhance participants' comprehension of this new technology. Furthermore, training must include the community and parents to enable them to assist and improve the learning process at home. Third, fostering knowledge and appreciation of technology in rural areas is essential. Educating the community about the advantages of utilizing Digital Audio Workstations in traditional music might enhance acceptance and support. Robust community support facilitates the seamless integration of technology in traditional music education, yielding superior outcomes.

This study significantly contributes to conventional music education, particularly by incorporating new technologies like Digital Audio Workstations (DAW). The findings indicate that using DAW enhances students' technical abilities and creativity while facilitating new avenues for preserving traditional music. The results affirm that technology may be tailored to enable cultural preservation, provided a balanced and intentional strategy is employed. This research necessitates a more comprehensive method for combining technology with traditional cultural teaching. In this context, DAW acts as a mechanism that links the past to the future, preserving cultural authenticity while fostering innovation and creativity. Educators should explore ways

technology might enhance learning objectives while respecting traditional cultural norms.

This research underscores the significance of sufficient infrastructural support and training for effectively applying technology in rural areas. In the absence of adequate support, the whole potential of DAW and other technologies may remain unfulfilled. Consequently, prioritizing investment in infrastructure and training is essential for all stakeholders, including the government, educational institutions, and local communities. This research facilitates subsequent investigations into the utilization of technology for cultural preservation. Considering the obstacles rural populations encounter in technology availability and adoption, more studies might investigate methods to enhance the incorporation of technology in arts education and its effects on preserving traditional culture overall.

6. Conclusions

This study concludes that integrating Digital Audio Workstation (DAW) as modern technology into conventional music education in Cisaat Village has significantly enhanced participants' musical skills and augmented their understanding of Sundanese traditional music. The DAW learning method has demonstrated significant advantages for younger learners, allowing them to interact with traditional music in a contemporary, accessible manner that improves their technical and intellectual understanding. Enhanced infrastructure and specialized training are essential to harness the potential of DAW integration in rural areas.

To address the financial and technological obstacles faced in Cisaat, community collaborations and local government initiatives should facilitate the establishment of DAW-compatible infrastructure. It would involve not just supplying affordable and accessible DAW-compatible equipment but also establishing dedicated locations for the community to utilize these tools freely. These improvements would alleviate the cost constraints currently restricting DAW access, facilitate broader participation among various age groups, and promote a more inclusive learning environment.

Additional plans encompass creating extensive technological training programs designed for instructors and participants. These classes could offer essential skills in DAW software, facilitating a smoother transfer to digital music tools, particularly for older learners and less technologically adept instructors. Furthermore, augmenting the accessibility of technological devices in rural regions, including computers and audio interfaces, is crucial for the sustainable integration of DAW-based learning with conventional music instruction. Collectively, these measures could enable rural communities such as Cisaat to safeguard and innovate their cultural legacy,

establishing a sustainable framework for music education that honours tradition while accommodating contemporary advancements.

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