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Collaborative Music Learning : Utilizing n-Track Application in Private Music Education

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Abstract: This study explores the utilization of n-Track, a digital audio workstation (DAW), as a collaborative tool in private music education. Unlike conventional music learning tools, n-Track enables real-time digital collaboration between teachers and students, facilitating asynchronous learning. This study presented a novel approach by utilizing mobile based DAW technology to enhance both in person and virtual music instruction, making it more accessible and interactive. Using a qualitative approach with a descriptive method, data was collected through observations and interviews with students engaged in n-Track-based learning. Thematic coding was used to identify recurring patterns and themes in the data, providing insights into the app's impact on student and teacher interaction. The findings indicate that n-Track enhances student engagement, supports independent practice, and improves teacher-student interaction efficiency. Key features such as multitrack recording, MIDI sequencing, and real-time feedback facilitate structured musical arrangements and instrumental skill development. This study also highlights the importance of digital literacy among educators to maximize the benefits of technology in music education. Despite limitations in the free version of n-Track, it remains effective in fostering creativity and autonomy in music learning. This research contributes to the advancement of digital music pedagogy, emphasizing the role of DAWs in modern music education.

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Introduction

Music learning, especially in the context of using digital media, has undergone significant changes in the way it is taught and received (Bagaskara, Rokhani, & Widodo, 2024; Nafrin & Hudaidah, 2021). Whereas previously music learning methods relied more on conventional face-to-face meetings, the development of digital technology has now encouraged adaptation in the learning process, enabling wider access and a more interactive learning experience (Hidayatullah, 2020; Kusnadi, Mulyana, & Rachmania, 2023). The use of digital applications and platforms in music education not only enriches the scope of teaching content but also increases student engagement through various tools and resources available online. Key aspects of technology integration in music education include the use of music software, virtual reality (VR), and social media platforms to create more interactive and dynamic learning experiences. Research shows that applications such as TikTok and YouTube not only serve as entertainment media, but also as effective learning tools, allowing students to explore and share music creatively (Abu Mansor Halimi & Mazlan, 2022; Anantia, Masnita, & Kurniawati, 2023). These findings are in line with other research that reveals that interaction through social media can enrich students' understanding of digital music platforms (Anantia et al., 2023; Vizcaíno-Verdú, De-Casas-moreno, & Tirocchi, 2023).

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Research conducted by Aulia & Setiawan, (2022) shows that the use of Sibelius 7 in multicultural art learning can improve students‘ competence in understanding musical notation and creating musical works. This application not only facilitates the delivery of material, but also plays a role in increasing students’ interest and involvement in the process of learning music. As one of the most widely used software, Sibelius 7 functions as an aid in learning musical notation.

Similar findings were revealed by Purnomo, Aulia, & Hirza, (2023)who stated that this application was proven to be effective in improving students' learning outcomes in music subjects. Therefore, Sibelius 7 can be a very useful tool for educators in teaching basic music concepts. Apart from Sibelius, various Android-based applications have also been developed to support music learning. Research conducted by Mahandra & Mariasa, (2023) developed the Kromo application, which is specifically designed for learning keroncong music and has been proven to increase students' independence and interest in learning. Meanwhile, research conducted by Susandi, Karyaningsih, & Suryani, (2023) produced an application for recognising traditional musical instruments aimed at young children. The results of this study show that digital technology not only functions as a means of learning music, but also has an important role in preserving local musical culture among the younger generation.

The n-Track application, a digital audio workstation (DAW) available on various platforms, including iOS and Android, is one of the technologies that has the potential to support private music learning. This application allows users to record, edit, and collaborate in music production flexibly, even via mobile devices. With features such as multi-track recording, audio effects, and integration with virtual instruments, n-Track can be used as a tool in the music learning process. Its collaboration-supporting capabilities enable interaction between teachers and students not only in face-to-face sessions, but also through digital recording and feedback, creating a more dynamic and interactive learning experience.

Furthermore, digitalisation in music education opens up wider opportunities for collaboration between students and teachers. By utilising digital technology, students can engage in virtual performances, receive real-time feedback, and share their work with a global audience (Asare, Twum, & Amoah, 2023; Mukti, Jazuli, & Syakir, 2023; Yin & Sondhiratna, 2024). This approach not only contributes to the development of their musical skills, but also forms a solid community among young musicians with similar interests. Research shows that the integration of technology in music learning not only increases student motivation, but also enriches their overall learning experience (Gibson, 2021; Wan, 2022).

Though digital media offer various benefits in music education, their use also presents challenges, one of which is the need for training for educators to be able to operate this technology effectively (Buchborn & Treß, 2023; Lyu & Sokolova, 2023). Therefore, improving digital competence among music teachers is an important aspect to ensure optimal use of technology in the learning process (Calvo & Hartle, 2024; Sušić & Palić, 2022). This music education in the digital age focuses not only on the adoption of new technologies, but also on efforts to create a learning environment that is inclusive and responsive to students' needs, also the quality of the material provided in music education and learning also depends on the competence of the teacher himself, how the teacher manages the learning process, understands the students and also the integration of the technology and curriculum that is mastered (Cipta, Sukmayadi, Milyartini, & Hardini, 2024).

This study aims to analyse the use of the n-Track application as a collaborative platform and tool in private music learning. Specifically, this study explores how this application can improve interaction between teachers and students, support the process of

independent practice, and facilitate more effective feedback in music learning. In addition, this study also examines the new contributions of n-Track in private music learning, particularly how n-Track facilitates real-time digital collaboration and asynchronous learning, which are rarely explored in traditional music education methods. This study expects that the integration of n-Track will significantly increase student engagement, improve learning efficiency, and improve the overall quality of learning outcomes. By facilitating interactive and flexible learning experiences, n-Track offers a new dimension to private music instruction, fostering greater independence, creativity, and deeper engagement among students in the learning process. This study anticipates that these findings will contribute to a broader understanding of digital tools in music education, paving the way for more inclusive and innovative learning environments.

Research Method

A qualitative approach with a descriptive method was used in this study, which aims to gain an in-depth understanding of social phenomena through systematic and interactive descriptions. This method emphasized data collection through observation, interviews, and document analysis, allowing researchers to explore meaning based on the perspective of the research subject (Fadli, 2021; Rusandi & Muhammad Rusli, 2021). In this approach, data collection and analysis were carried out simultaneously and continuously, so that the results obtained can describe the phenomenon comprehensively (Rijali, 2019).

To ensure the validity and credibility of the research data, triangulation was employed. Triangulation was conducted through multiple data collection methods, including direct observation, participatory observation, and interviews with students. This approach helped to cross-check and verify the findings from different perspectives and reduce bias. Additionally, triangulation was also applied by involving different data sources, such as students' self-reports, teacher feedback, and observation notes, ensuring that the conclusions drawn are based on a broad range of data.

Participants in this study included students who took private music lessons via home visits. The sample consisted of three students ranging from adolescence to adulthood, selected purposely based on their involvement in the learning process using N-Track digital media. The sample was selected using purposive sampling, which is a technique for determining a sample based on certain criteria relevant to the research objectives (Limna & Kraiwanit, 2024; Rana, Poudel, & Chimoriya, 2023).

Data collection was carried out through direct observation and participatory observation, where the researcher documented the development of students' abilities before and after the use of digital media. Research instruments in the form of observation notes were used to record important aspects of the learning process, such as the level of understanding, technical skills, and student responses to the methods applied. Data analysis was carried out using an interactive model that includes data reduction, data presentation, and drawing conclusions (Miles, Huberman, & Saldana, 2013, 2018). The analysis process was carried out inductively, where the findings of each individual were interpreted to produce broader conclusions regarding the role of technology in private music learning.

Results and Discussion

Introduction n-Track Application

At the initial stage of the research, learners were introduced to the n-Track application as the main medium for private music learning. This introduction began with the process of searching for the application in the Play Store, which aimed to provide students with an

understanding of how to download and install digital-based software independently. This step not only ensures the accessibility of the application for each student but also improves their digital literacy in managing software that supports music learning. After the application was successfully installed, students were directed to open n-Track and observe the user interface (UI). At this stage, students were given an understanding of the navigation structure in the application, including the menu layout, functional icons, and accessibility of the main features. This introduction aims to enable students to understand how the n-Track application can be used as an Android-based Digital Audio Workstation (DAW) that supports the process of recording and producing music in a simple way. With a systematic approach, students are introduced to the basic features available in the application.

The main features introduced include multitrack audio recording, which allows students to record their instrument playing individually or in different layers of sound. In addition, audio import and export features are also introduced as part of the recording process, where students learn to upload external audio files and save their recordings in various formats. To enrich musical exploration, students are also given access to n-Track's built-in virtual instruments (VST), which include piano, guitar, bass, drums, orchestra, and digital-based synthesizers (synth). Furthermore, students are directed to try out various features directly by interacting with their devices. They are taught how to start and stop recording using the record and stop buttons, as well as how to rearrange audio clips with drag and drop techniques in the timeline. In addition, students are also introduced to tempo and metronome settings, which are crucial elements in maintaining rhythmic precision during practice and recording.

To support a more comprehensive understanding, the researcher provided direct guidance on the use of each feature, including how to adjust the tempo, adjust the sound balance, and systematically arrange the recording structure. This exploration process was carried out with an approach oriented towards active student participation, so that they not only understood the theory behind the use of the application but also had practical skills in operating this simple Android-based DAW. In addition to the technical aspects, the introduction of the n-Track application is also focused on its use as a tool in musical analysis, where students are invited to evaluate their own recordings. Through the process of exploration through media, they can understand how the use of digital technology can support the development of musical skills in a more effective and structured way (Adriaan & Suryati, 2023; Ardipal, 2020; Ferdian, Hidayat, Sari, & Darma Putra, 2023). Overall, this introductory stage forms a solid foundation for using n-Track as part of the private music learning process. By understanding how this application works, students are better prepared to move on to more complex digital production-based learning stages, such as advanced audio manipulation and using n-Track in minus one-based practice.

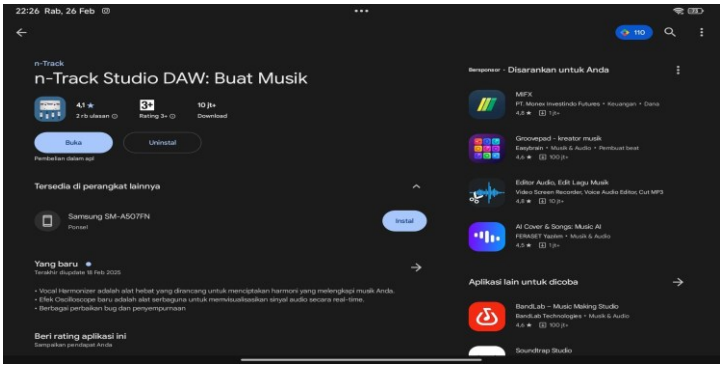

Figure 1. n-Track Studio app on the Android Play store

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Exploring the n-Track Feature: From Recording to Digital Audio Management

The exploration phase of the features in the n-Track application is focused on utilizing it as a simple digital sequencer that allows students to manage audio and MIDI recordings independently. This process began with an introduction to the audio import function, where students are directed to find song files that will be used as references in their learning. The song was obtained through an online search to get the appropriate BPM (Beats Per Minute) data. After obtaining accurate tempo information, students set the tempo in their project using n-Track's built-in feature to synchronize with the recording to be made.

After the tempo setting stage, students began to explore the sequencer mechanism, which includes importing audio into the application timeline and placing files in available slots. They are given the freedom to adjust the position of audio clips, make cuts if necessary, and adjust the length of clips to suit their practice needs. At this stage, students are also given an understanding of the concept of layering in digital music production, where they learn how to systematically arrange audio elements to create a more organized musical structure. As part of the exploration process, students began to manage the placement of audio in their projects themselves, including adjusting volume, sound balance (panning), and adding a metronome as a rhythmic guide. The researcher provides guidance on additional sound elements that can be included, such as a layer of strings to enrich the harmony, a drum beat to clarify the rhythm, and the sound of a hi-hat as a tempo reference when students practice playing the main instrument.

In addition to recording-based audio manipulation, students are also introduced to n-Track's built-in piano MIDI feature, which allows them to draw MIDI patterns manually. With this feature, they learn how to place notes on the MIDI grid to create various supporting elements in their arrangements. The researcher provides guidance on the right position to add sound elements, such as the placement of string chords in certain parts of the song, the arrangement of drum patterns that match the main rhythm, and the use of digital hi-hats to help maintain a steady tempo in their practice. During this exploration process, students actively try out the various features available, experiment with different sound placements, and develop their understanding of how the elements in a music production can be systematically arranged. This process not only improves students' technical skills in using n-Track as a digital music production tool but also helps them build a deeper understanding of musical structure, rhythmic coordination, and creative exploration in digital audio processing.

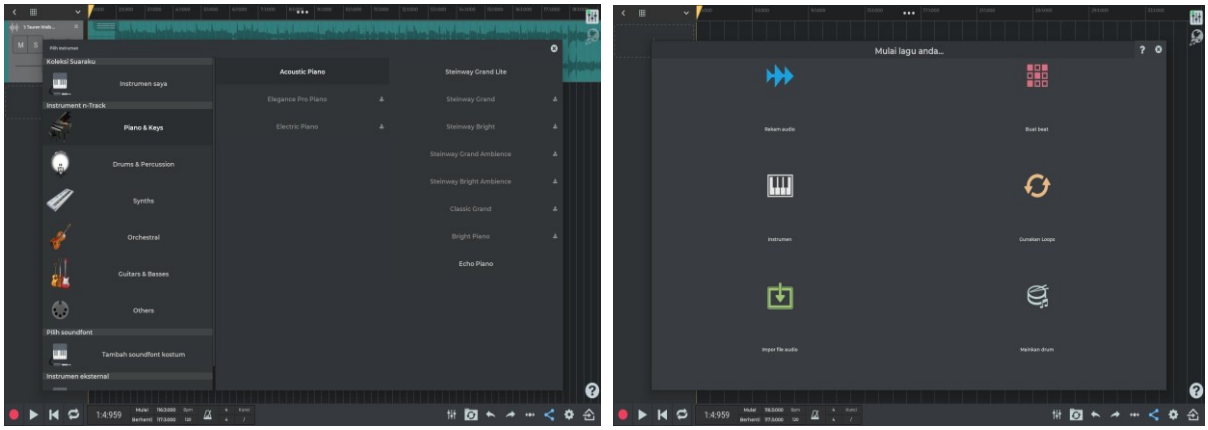

Figure 2. The features provided by n-Track Studio

n-Track as a Simple Digital Sequencer for students

Utilizing n-Track in private music learning acts as a simple digital sequencer that allows students to manage backing tracks and minus ones independently. Using this

application, students learn how to control the flow of digital music sequences, including determining when a sequence starts and stops according to their practice needs. This ability provides flexibility in the learning process, where students not only act as instrument players, but also as digital audio managers who organize their learning flow more systematically.

Before starting the practice session, students have received learning materials and materials that have been compiled based on their needs and objectives. In the context of this private lesson, each student has specific musical preferences and learning targets, which have been communicated to the researcher beforehand. Therefore, the researcher compiled teaching materials tailored to the students' wishes, including mapping of the material to be studied and learning strategies used in practice sessions. This approach ensures that learning is purposeful and based on individual needs, which is one of the advantages of the joyful learning method in private music education. In practice, students are given the freedom to choose the songs they like, most of which are from the pop genre. This genre generally has a relatively simple musical structure, with a repeating chord progression, making it easier to analyze and apply in the context of digital music learning (Kim & Kyoung Song, 2020; Žiga et al., 2021). By choosing songs that suit their preferences, students have higher intrinsic motivation to practice, while gaining first-hand experience in understanding chord structure, rhythm, and the interaction between instruments in musical arrangements.

Besides functioning as a tool for practicing instruments, n-Track also helps students to stabilize their tempo when playing instruments such as the piano and guitar. With the metronome and tempo setting features, students can more easily maintain rhythm consistency and improve their skills in playing in sync with the backing track (Acquilino & Scavone, 2022; Lee, Kim, Kim, & Kang, 2022; Yogev-Seligmann et al., 2023). This ability is crucial in music learning, especially in developing coordination between motor skills and musical hearing. One of the main advantages of using n-Track as a simple digital sequencer is its ability to replay certain parts of a song, especially those that students find difficult. With this feature, students can analyze their own playing, identify mistakes, and improve their playing techniques more effectively. In addition, previously recorded results can be used as a reference in subsequent practice sessions, allowing students to evaluate their progress over time.

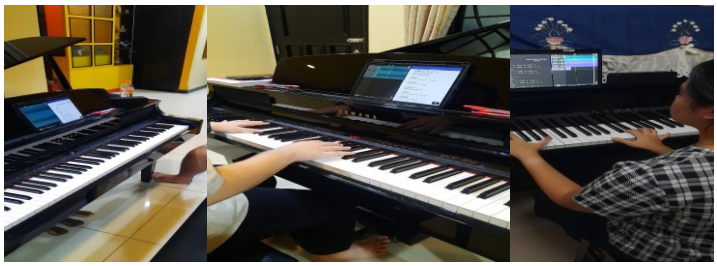

Figure 3. Three students are following the learning process with the N-Track Studio

In technical aspects, students also learn how to determine the entry point in their game based on the arrangement structure they have created in the n-Track project. For example, before they start playing, they have arranged that the intro part would be filled by string instruments, then they would enter the verse or reff part according to the structure they have set. This trains their ability to analyze the structure of a song in more depth, as well as developing skills in arranging the layout of instruments in a digital music project. Through the use of a simple digital sequencer tool, students gain broader experience in integrating

technology into musical practice, while increasing their independence in managing the rehearsal process more effectively and systematically (Pierard & Lines, 2022).

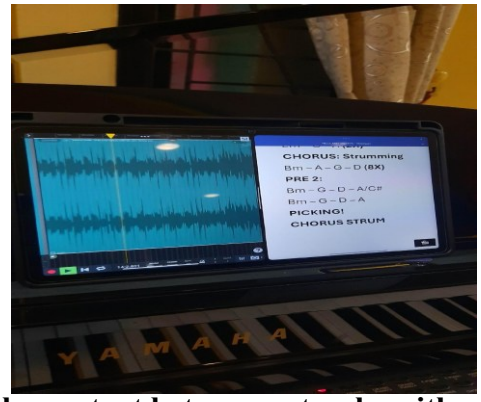

Figure 4. Divide the content between n-tracks with content notes

Discussion and Implications on the Learning Process

In the implementation of learning that supports the learning process, the use of differentiated learning is applied alongside various pedagogical approaches designed to accommodate students' needs in understanding the material (Hanif Evendi, Yossie Rosida, & Dani Zularfan, 2023; Herwina, 2021; Widianto & Fauzi, 2024). One of the main methods used is the lecture method, which provides students with a conceptual understanding of the n-Track application, including the steps for downloading, installing, operating main features, and applying it in a music learning context. This method lays the foundation for students to understand the function and benefits of the application before engaging in hands-on use.

The demonstration approach also encourages active student participation, as reflected in the various questions raised about specific features they wish to explore further. The researcher acts as a facilitator, guiding but also allowing students to experiment independently, increasing their confidence in using technology as a learning tool (Rizka Aulia et al., 2024; Triana, 2024; Trimastuti & Azizah, 2023). Additionally, the drill method is implemented to reinforce students' understanding of n-Track's functionality and improve their instrumental skills. Students undergo structured exercises that focus on synchronizing their playing with backing tracks arranged in n-Track.

Collaboration in learning is also emphasized, occurring at multiple levels, including student-teacher interaction and peer collaboration (Fitriasari, Apriansyah, & Antika, 2020; Triana, 2024). Teachers occasionally participate in playing more complex musical parts, while students use virtual instruments in n-Track Studio to develop their compositions. This approach enhances students' ability to integrate different musical elements in digital production. Supporting student autonomy through sequencer-based learning increases both motivation and learning satisfaction (Bonneville-Roussy, Hruska, & Trower, 2020; Butler, 2022).

Evaluation and Challenges

While n-Track has proven effective in facilitating digital music learning, several challenges remain. The free version of the application has limitations in premium features, which may restrict students' ability to explore advanced digital music production. This issue is highlighted by previous studies, which emphasize the role of access to resources in enhancing learning outcomes in digital education (Zheng, Jiang, & Cui, 2024). Additionally, digital literacy among both educators and students is crucial for optimizing the use of such technologies in learning (Buchborn & Treß, 2023). As highlighted by Hidayatullah (2020),

the integration of technology in education requires educators to not only adopt new tools but also cultivate the necessary skills to maximize their impact.

Although traditional methods such as lecture and drill techniques effectively build foundational music skills, the integration of project-based learning (PBL) could significantly enhance creativity and problem-solving abilities (Usmeldi & Amini, 2022; Winarko, 2024). The incorporation of real-world projects and collaborative work can provide a platform for students to apply their learning in practical contexts, fostering collaborative skills and critical thinking (Nanjundaswamy, Baskaran, & Leela, 2021; Siregar et al., 2024). To improve implementation, future studies should explore the application of n-Track in various musical genres, assess its long-term impact on student learning, and investigate alternative platforms for digital music collaboration. This will provide a more comprehensive understanding of how digital tools can transform music education. Conceptually, this research contributes to the understanding of digital pedagogies and the importance of integrating interactive, technology-driven tools in the learning process (Gibson, 2021). Practically, it emphasizes the need for continuous development of digital literacy among educators to ensure effective implementation in a rapidly evolving educational landscape. Addressing these aspects will help ensure a more inclusive, engaging, and technologically adaptive music education system, aligning with the goals of modern pedagogy, which aims to prepare students for a digitalized world (Calvo & Hartle, 2024).

Conclusion

This study proves that n-Track is effective as a collaborative platform for private music learning. Its use increases teacher-student interaction, student engagement, and the efficiency of independent practice. Features such as multitrack recording and MIDI sequencing help students arrange arrangements and improve their instrumental skills. Digital literacy for educators is an important factor in optimizing this technology. Although the free version has limitations, n-Track is still effective in encouraging student creativity and independence. This study contributes to the development of digital music pedagogy, emphasizing the role of DAWs in improving the quality of music learning. Further research is recommended to explore its application in various music genres and its impact on students' cognitive and affective aspects.

Recommendation

Future research should explore the application of n-Track across different musical genres and its long-term impact on students' technical skills and creative development. Further studies could also investigate the integration of advanced DAW features to enhance music pedagogy. A key challenge in implementing digital music learning is educators' digital literacy, which requires training programs to optimize technology use. Additionally, limitations in the free version of n-Track may affect its full potential, highlighting the need for accessible digital tools in music education.

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