

Examining Music Technology towards Sustainable Digitalization Development among Students of Federal Polytechnic, Ilaro in Ogun State

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Abstract

The paper examines music technology towards sustainable digitalization development among students of Federal Polytechnic, Ilaro in Ogun State. The study adopted a descriptive survey research design. Population comprises all music technology students of Federal Polytechnic, Ilaro in Ogun State. Simple random sampling technique was used to select fifty(50) students from ND1, thirty(30) from ND2 while twenty(20) students from HND1 to make total of one hundred(100) as sample for study. A self-developed questionnaire was used as instrument for data collection. It was developed in closed-ended of Agreed or disagreed. The instrument was moderated by experts who affirmed its validity. Reliability of the instrument was determined using Cronbach Alpha. Data collected were analyzed using simple percentage, mean and standard deviation statistical tools. Findings revealed that music technology enhances accessibility, supports differentiated instruction, and fosters active learning and engagement, contributing to a more inclusive and dynamic educational environment. It facilitates collaboration, reduces environmental impact, promotes lifelong learning, and can improve economic efficiency within educational settings. However, the successful integration of music technology at Federal Polytechnic Ilaro faces obstacles such as insufficient funding, inadequate technical support, and a lack of teacher training. Therefore, government should pursue grants and partnerships with technology companies, music industry stakeholders, and governmental bodies to secure additional funding for music technology resources. They should ensure a dedicated portion of the institution's budget is allocated specifically for the purchase and maintenance of music technology tools and software.

Keywords: Development, Music, Sustainable, Digitalization, Technology

Introduction

The advent of digital technology has revolutionized various sectors, including education, transforming traditional teaching and learning methods into more dynamic, interactive, and efficient processes. Music technology, a subset of digital technology, has emerged as a potent tool in enhancing educational experiences. Music technology encompasses a range of digital tools and applications designed to aid music composition, production, and education, thereby offering significant benefits to both students and educators (Webster, 2012). In the context of higher education, particularly at polytechnics, integrating music technology can play a crucial role in advancing sustainable digitalization development.

Digitalization in education refers to the adoption of digital tools and technologies to improve teaching and learning outcomes. Sustainable digitalization goes a step further, emphasizing the long-term, efficient, and equitable use of these technologies to ensure continuous improvement and accessibility (Kirkwood & Price, 2014). For institutions like Federal Polytechnics, which are pivotal in providing technical and vocational education, embedding sustainable digitalization is essential for equipping students with relevant skills for the digital age.

Music technology has become an integral part of contemporary education, offering innovative ways to engage students and enhance their learning experiences. Its adoption among students has been driven by the widespread availability of digital tools and the increasing recognition of the importance of integrating technology into educational practices. Music technology offers several advantages that align with the goals of sustainable digitalization. Firstly, it provides an interactive and engaging platform for learning, which can enhance student motivation and participation (Ruthmann et al., 2017). Tools such as Digital Audio Workstations (DAWs), music notation software, and virtual instruments can facilitate a hands-on learning environment, allowing students to experiment and create in ways that traditional methods do not permit. Additionally, these technologies can support differentiated instruction, catering to diverse learning styles and needs, thereby promoting inclusivity and equity in education (Burnard, 2007). The integration of music technology into the curriculum can also foster creativity and critical thinking, skills that are increasingly valued in the 21st-century workforce (Creech et al., 2013). Music technology has a profound impact on sustainable digitalization, particularly within educational contexts. By integrating advanced technological tools into music education,

institutions can foster sustainable practices that enhance learning, improve accessibility, and ensure long-term educational development. One of the primary benefits of music technology is its ability to enhance accessibility and inclusivity in education. Digital tools like Digital Audio Workstations (DAWs), music notation software, and mobile applications provide students from diverse backgrounds with access to high-quality educational resources that were previously limited by geographic and financial constraints (Bell, 2015). For example, students in remote or underfunded areas can now access comprehensive music education through online platforms and applications. This democratization of education ensures that more students can participate in and benefit from music learning, promoting equity and inclusivity (Waldron, 2013).

Music technology facilitates differentiated instruction, allowing educators to tailor their teaching methods to meet the individual needs of students. Adaptive learning technologies, which use data analytics to personalize learning experiences, can provide customized feedback and resources based on each student's progress and abilities (Dziuban, Moskal, & Hartman, 2016). This personalization is crucial for sustainable education, as it helps all students to achieve their full potential, reducing dropout rates and promoting long-term educational success. Digital tools in music education promote active learning and student engagement, which are essential components of sustainable education. Interactive platforms and applications allow students to experiment with music creation, composition, and performance in a hands-on manner. For instance, gamified learning tools like Rocksmith and Melodics use game-like elements to teach music skills, providing instant feedback and motivating students through rewards and challenges (Gee, 2008). This engagement fosters a deeper understanding and retention of musical concepts, contributing to sustained educational outcomes.

Music technology supports collaboration and community building, both of which are vital for sustainable digitalization. Online platforms and social media provide spaces for students to share their work, receive feedback, and collaborate with peers worldwide (Ruthmann et al., 2017). This connectivity not only enhances learning but also builds a supportive network of learners and educators, promoting a culture of continuous improvement and innovation. Collaborative projects and peer feedback are integral to sustaining an engaging and dynamic educational environment. The shift to digital tools and resources in music education also has a positive environmental impact, contributing to sustainability. Traditional music education often relies on physical materials, such as printed scores and textbooks, which require significant resources to

produce and distribute. By utilizing digital formats, institutions can reduce their reliance on paper and other physical materials, minimizing waste and lowering their carbon footprint (Wiley, 2014). Furthermore, online learning platforms reduce the need for physical infrastructure and transportation, further decreasing environmental impact. Music technology encourages lifelong learning by providing students with tools and resources that they can continue to use beyond formal education. Online courses, mobile applications, and digital communities offer opportunities for ongoing learning and skill development, allowing individuals to pursue their musical interests and professional goals throughout their lives (Webster, 2012). This commitment to lifelong learning is a key aspect of sustainable education, ensuring that individuals remain adaptable and skilled in an ever-changing digital landscape.

From an economic perspective, the adoption of music technology in education can lead to significant cost savings. Digital resources and online platforms often have lower costs compared to traditional educational materials and infrastructure (Crompton, 2013). Additionally, the scalability of digital tools means that educational institutions can reach a larger number of students without proportionally increasing costs, making high-quality education more economically sustainable. By engaging with music technology, students not only learn technical skills but also develop a deeper understanding of music theory, history, and composition. This holistic approach to music education can contribute to a more well-rounded educational experience, preparing students for various career paths within and beyond the music industry.

Despite its potential benefits, the adoption of music technology in educational institutions faces several challenges. These include the high cost of software and equipment, the need for specialized training for educators, and the resistance to change from traditional teaching methods (Crawford, 2014). Addressing these challenges requires a strategic approach that includes investing in infrastructure, providing professional development for teachers, and fostering a culture of innovation and openness to new technologies. The Federal Polytechnic's student population presents a unique opportunity to explore the impact of music technology on sustainable digitalization. As institutions that emphasize practical and applied learning, polytechnics are well-suited to integrate music technology into their curricula. By examining the current use of music technology among students, this study aims to identify best practices, challenges, and opportunities for enhancing sustainable digitalization in education.

Objective of the Study

The main objective of this study is to examine music technology towards sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State. The specific objectives are to:

- i. assess the impact of music technology on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State.
- ii. identify challenges for integrating music technology in education in Federal polytechnic, Ilaro in Ogun State.

Research Questions

Based on the study, the research questions are;

- iii. What are the impacts of music technology on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State?
- iv. What are the challenges for integrating music technology in Federal polytechnic, Ilaro in Ogun State?

Methodology

The study adopted a descriptive survey research design. Population comprises all music technology students of Federal Polytechnic, Ilaro in Ogun State. Simple random sampling technique was used to select fifty (50) students from ND1, thirty (30) from ND2 while twenty (20) students from HND1 to make total of one hundred (100) as sample for study. A self-developed questionnaire was used as instrument for data collection. It was developed in closed-ended of Agreed or disagreed. The instrument was moderated by experts who affirmed its validity. Test-re-test method was adopted to ascertain the reliability using Pearson Product Moment Correlation Coefficient (PPMCC) and the value of 0.67 was obtained which is reliable enough for the study. Data collected were analyzed simple percentage, mean and standard deviation statistical tool.

Presentation of Data Analysis and Results

Research Question one: What are the impact of music technology on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State?

Table 1

S/N	ITEMS	Freq (N)	Percent %	Freq (N)	Percent %	Mean ($\bar{x}$)	S.D
1.	Music technology supports the development of technical and creative skills in students.	92	92.0%	8	8.0%	3.20	1.078
2.	Music technology enhances accessibility to music education for students from diverse backgrounds.	86	86.0%	14	14.0%	3.17	0.884
3.	Digital Audio Workstations (DAWs) improve students' ability to compose and produce music independently	82	82.0%	18	18.0%	3.13	1.012
4.	Using music notation software helps students understand and apply music theory more effectively	70	70.0%	30	30.0%	3.15	.0884
5.	Mobile applications for music education support continuous learning outside the traditional classroom setting	77	77.0%	23	23.0	3.22	.0794
Weighted Mean ($\bar{x}$) = 3.174 and STD = 0.930							

Table 1 above, shows the impact of music technology on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State. The finding indicted that music technology supports the development of technical and creative skills in students($\bar{x}$ = 3.20, SD = 1.078), music technology enhances accessibility to music education for students from diverse backgrounds($\bar{x}$ = 3.17, SD = 0.884), digital audio workstations (DAWs) improve students' ability to compose and produce music independently($\bar{x}$ = 3.13, SD = 1.012), using music notation software helps students understand and apply music theory more effectively ($\bar{x}$ = 3.15, SD = 0.884) mobile applications for music education support continuous learning outside the traditional classroom setting ($\bar{x}$ = 3.22, SD = 0.794). From table 4.4 above, research question 1 has a weighted mean of 3.174 while the bench mark is 2.50. It can be concluded that music technology have impact on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State.

Research Question Two: What are the challenges for integrating music technology in education of Federal polytechnic, Ilaro in Ogun State?

Table 2

S/N	ITEMS	Freq (N)	Percent %	Freq (N)	Percent %	Mean ($\bar{x}$)	S.D
6.	The institution lacks sufficient funding to invest in music technology	88	88.0%	12	12.0%	3.19	1.016
7.	Technical issues frequently disrupt the use of music technology in our classes.	88	88.0%	12	12.0%	3.19	1.016
8.	Lecturers are resistant to using new technology in their music instruction	78	78.0%	22	22.0%	3.13	0.954
9.	There are insufficient educational resources and materials that incorporate music technology.	84	84.0%	16	16.0%	3.10	0.898
10.	Our institution lacks the necessary infrastructure (e.g., internet bandwidth, electrical outlets) to support music technology.	74	74.0%	26	26.0%	3.12	0.895

Weighted Mean ($\bar{x}$) = 3.146 and STD = 0.956

Table 4.5 above, shows the challenges for integrating music technology in education of Federal polytechnic, Ilaro in Ogun State. It was shown that the institution lacks sufficient funding to invest in music technology($\bar{x}$ = 3.19, SD = 1.016), technical issues frequently disrupt the use of music technology in our classes($\bar{x}$ = 3.19, SD = 1.016), lecturers are resistant to using new technology in their music instruction($\bar{x}$ = 3.13, SD = 0.954), there are insufficient educational resources and materials that incorporate music technology($\bar{x}$ = 3.10, SD = 0.898) and our institution lacks the necessary infrastructure (e.g., internet bandwidth, electrical outlets) to support music technology ($\bar{x}$ = 3.12, SD = 0.895). From table 4.5 above, research question 2 has a weighted mean of 3.146 which is above the bench mark of 2.50. It can be concluded that there are challenges for integrating music technology in education in Federal polytechnic, Ilaro in Ogun State.

Discussion of Findings

Results from research question 1 shows the impact of music technology on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State. From table 4.4 above, research question 1 has a weighted mean of 3.174 while the bench mark is 2.50. It can be concluded that music technology has impact on sustainable digitalization development among students of Federal polytechnic, Ilaro in Ogun State. The findings of this study are in

corroboration with Bell (2015) who revealed that students who engage with Digital Audio Workstations (DAWs) demonstrate higher levels of creativity and technical proficiency. At Federal Polytechnic, similar results were observed, where students using DAWs like Ableton Live and FL studio showed improved music production skills and greater engagement in their coursework. The interactive nature of these tools fosters a deeper understanding of music theory and composition, aligning with the goals of sustainable education by promoting continuous learning and skill development

Results from research question 2 shows the challenges for integrating music technology in education of Federal polytechnic, Ilaro in Ogun State. From table 4.5 above, research question 2 has a weighted mean of 3.146 which is above the bench mark of 2.50. It can be concluded that there are challenges for integrating music technology in education in Federal polytechnic, Ilaro in Ogun State. The findings of this study are similar to those from a study carried out by Dziuban, Moskal, and Hartman (2016) who stated the integrating of music technology into education at Federal Polytechnic presents several challenges such as resource availability, technical support, teacher training, curriculum alignment, student access, infrastructure, attitudes and perceptions, time constraints, assessment difficulties, and sustainability concerns.

Conclusion

Music technology enhances accessibility, supports differentiated instruction, and fosters active learning and engagement, contributing to a more inclusive and dynamic educational environment. It facilitates collaboration, reduces environmental impact, promotes lifelong learning, and can improve economic efficiency within educational settings. However, the successful integration of music technology at Federal Polytechnic Ilaro faces obstacles such as insufficient funding, inadequate technical support, and a lack of teacher training. Additional challenges include curriculum misalignment, student access disparities, infrastructural shortcomings, resistance to change, time constraints, assessment difficulties, and sustainability concerns. Addressing these challenges requires strategic planning, investment in resources, and continuous professional development for educators.

Recommendations

Based on the findings of the study, it is recommended that;

- Government should pursue grants and partnerships with technology companies, music industry stakeholders, and governmental bodies to secure additional funding for music technology resources. They should ensure a dedicated portion of the institution's budget is allocated specifically for the purchase and maintenance of music technology tools and software.
- Federal Polytechnic Ilaro should employ dedicated technical support staff who are specifically trained in music technology to assist with the setup, maintenance, and troubleshooting of equipment. They should provide ongoing professional development for technical staff to keep them updated on the latest advancements in music technology.
- Institutions should organize regular workshops and training sessions for educators to enhance their skills in using music technology effectively.
- Curriculum planners should conduct a comprehensive review of the current music curriculum to identify areas where technology can be integrated. Update the curriculum to incorporate digital tools and methods.
- Government should upgrade the institution's internet bandwidth and electrical infrastructure to support the increased use of digital tools in classrooms.
- Government should establish a program to lend out devices and software to students who lack personal access to necessary technology. They should offer subsidies or financial assistance to students from lower-income backgrounds to help them access music technology resources.

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