The Impact of Digital Tools on Student Attention and Engagement in Virtual Music Classrooms: A Quantitative Survey-Based Analysis

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ABSTRACT

The significance of this study is on the effectiveness of the use digital tools in virtual music classrooms in improving students' attentiveness and engagement in modern music education, will also make music education more easily accessible, more effective and more engaging. The main aim of this study is to assess the impact of digital tools on how attentive students are, and how well they contribute in virtual music classrooms. The method used was quantitative research method. The results of the study showed that use of digital tools in virtual classrooms increases students' attention and engagement in the class. Students' taken in virtual class with the use of digital tools showed more attention and participation in class than those those taken without use of digital tools. Generally, the use of digital tools in virtual music classrooms leads to an improvement in learning of music in music education as increased students' attention and engagement in the class.

KEYWORDS: digital tools, virtual classroom, music education, music students'

Introduction

The recent world currently is going through a digital revolution which has impact on the life of the people such as culture and education. This digital revolution also has impact on music education, and the major question which requires an answer is how digital technologies can be used to improve the learning of music, create new opportunities for that aids self-expression, creativity and easy of accessibility of education to a vast category of the population (Abidinovich, 2021). The concept of music education is about to make a historical difference as a result of introduction of digital tools in its learning. Creating new forms of learning and creativity, these tools gives a great opportunity for both teachers and students in music education (Cao, 2021). Likewise, these tools create new challenges and seeks an answer to its impact and effectiveness in music education.

This digital revolution has changed how we see education from the usual face-to-face and teacher-centred teaching to a student-centred approach that emphasizes active learning, collaborative learning, and even

content preparation. Teachers can now hold classes with the students when they are both in different locations and even at different times (Bocheliuk et al., 2022).

This research is significant as a result of some important aspects. Scientific research and methodological approaches absent makes it difficult to objectively analyse the impact of digital tools on music education through virtual music classrooms. Imbalance in accessibility to digital resources and infrastructure also brings a disproportionate in opportunities of learning for various educational institutions and students. Also key is the challenge of finding the requirements and methods for assessing the quality of music education with respect to use of digital tools in virtual classrooms, as it involves developing standards and methodologies for objectively measuring of results.

Conducting a research on the impact of digital tools on students' attention and learning on virtual music classrooms is necessary to develop this mode of learning, it will also make music education more easily accessible, more effective and more engaging. The main aim of this study is to assess the impact of digital tools on how attentive students are, and how well they contribute in virtual music classrooms. This study employs a quantitative research method whereby a numerical data was collected from a population sample through a survey, and it was analysed using a statistical method (frequency).

Previous Research

Use of digital tools in music education gives more advantages towards better understanding of the concept. Though its implementation is of concern. According to Iukhno (2019), creating an enabling educational environment like giving access to digital tools, training teachers on the use of digital tools, and introducing digital tools into academic curricula is very important for promoting competence in digital tools in the students'. Solopko and Shevchuk (2022) in their words laid emphasis on the relevance of training teachers in the use of digital tools in improvement in music education. A study carried out in China by Yiping (2021) showed that collective projects, practical displays, and use of multimedia had more positive impacts in the impacting of digital tools knowledge in art teachers. According to the findings of Buleshkaj and Koren (2022), usage of digital tools in music education gave teachers the opportunity to form individual based curricula which caters for the need of each individual student. These digital tools can be used to form assignments and learning materials that specific to a student's intellectual capacity by the teachers. For example, students can be given different assignments based on their intellectual capacity to allow them know more about a topic since it is within their level. Students with a specific interest or needs can have a curricula which caters for their needs by the teachers, this will foster the process of learning and also increase the effectiveness of learning (Kenesbayev et al., 2017; Sansyzbayeva et al., 2022). In a study carried out by Tahirsylaj and Fazliu (2021) on use of digital tools among music students, it was observed that students who engage in the use of digital instruments had a better understanding of structures of music and the skills required technically. The use of digital tools has brought an improvement in music composition and music arrangement. Salihu et al. (2019) reported from the study they conducted that the use of graphic tools and visuals in music education created an unlimited ways for visualisation and illustration of elements of music and the concepts of music. These digital tools gives the teachers opportunities to make charts, visual diagrams, graphs and engaging tools which are useful in the explanation of difficult concepts in music. From the findings of Luzha (2015), usage of digital tools in music schools added to the growth of creativeness in a lot of students. This findings is an indication that students engaged in the use of digital platforms came up with more original music and expressed greater self-sufficiency in music. This shows that use of digital tools in music

education gives students the opportunities of self-discovery of creativity (Marzhan et al., 2022; Tleubekova et al., 2023). According to the study of Breznica (2018) on "how the use of special software for analysing musical structures contributed to the understanding and analysis of complex musicalcompositions" (Breznica, 2018), the impact of digital instruments in music education was emphasized. Jakupi and Muçolli-Dehiri (2018) in their study revealed how the combination of music with visual presentation and interactive components increased music perception among students as well as response emotionally. The use of digital tools is music education increased the knowledge of students on musical works. Use of interactive components foster the process of learning, as well as attention stimulation in students (Bocheliuk et al., 2022).

Digital tools used in music education

A very important digital tools in music education is the Digital Audio Workstations, these tools gives a conducive environment for recording music, editing music, mixing and mastering of music (Yang, 2021). Examples of are GarageBand, Logic Pro X and Audacity. These tools provides virtual musical instruments, sound effects, loops, advanced music editing and it suitable for all levels of music expertise. Digital Audio Workstations also consists of applications and web-based tools which are simple to use in creating music, and this make them fit to be used in educational environments or settings. Examples of these are BandLab, Soundation and Soundtrap. These platforms fosters improvement in learning in music education (Ouyang, 2023).

General Overview of Digital Tools in Music Education

In modern music education, digital tools are becoming a very important part of teaching music. It has been established that it has a significant impact in learning music and musical skills development. These tools gives both teachers and students the opportunity to have a better understanding of music. These tools gives students the opportunity to learn comprehensively about music at any place and any time. A very important factor for this is that there is abundance learning materials for music as a result of "specialized programs and resources" (Mygdanis, 2023). Through these tools, students can improve their music playing skills through the use of virtual instruments. Digital tools also makes it possible for students to interact with professional musicians, as well as with their teachers virtually. Interaction with professional musicians will improve the learning interest of students in music as well as improve their understanding of music and interaction with teachers (virtually) will keep the students inclined to the study of music. Use of digital tools creates a better interaction between students and teachers. The use of digital platforms for learning according to a study by Mygdanis (2023), created an avenue for students to work together on musical projects which lead to a better interaction and more collaborative music lessons. Study carried out by Cuervo et al. (2022) also showed that students who engage in the use of digital tools retained 30% more than students who do not. "The use of interactive applications, visual materials and resources can create a more engaging learning environment that contributes to improving student outcomes in music education in general" (Ismail et al., 2022).

Method

The main method that this study used was quantitative research method. This method was chosen because the nature of the study deals with a large population and the method is the best for a large sample population. Due to large number of data that was required for the study, the method was also used because it also allows for data to be collected quickly. The method is the best for identifying trends

and patters and for making a confident conclusion in a study. The study was carried out at a Secondary school in Lagos, Nigeria. The school teachers assisted in carrying out the survey. Out of a total of 150 music students (ages 13 - 15), a total of 100 students were randomly selected through simple random sampling method. The 100 students were divided into two groups of 50 students each. The study took 2 days. The first group of 50 students were taken in a virtual class in the first day, without the use of digital tools. The music teacher took a record of the students' attentiveness and engagement in the virtual class. The second day had the second group of 50 students taken in a virtual class, this time with use of digital tools, and the music teacher took record of the students' attentiveness and engagement in the class session. The second group made use of digital audio workstation software (Avid Pro Tools and Ableton Live) for their class session. The researcher was able to carry out the survey through the assistance of the teacher who helped to access the perceptions of class attentiveness and engagement using a 5-point Likert scale. The survey gave a quantitative complement to test scores for evaluating the impact of digital tools in virtual classrooms.

Table 1: Likert scale used for the study

1	2	3	4	5
Excellent	Very good	Good	Fair	Poor

Findings and Discussion

Attention to the teacher's explanation during the virtual class

Table 4.1: Attention to the teacher's explanation (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	16	32.0	32.0	32.0
	Good	34	68.0	68.0	100.0
	Total	50	100.0	100.0	

Table 4.2: Attention to the teacher's explanation (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	37	74.0	74.0	74.0
	Very good	13	26.0	26.0	100.0
	Total	50	100.0	100.0	

The attention of the two groups of the students' during the virtual class conducted by the teacher varied. It was observed that the attention rate of the students' who were engaged in the virtual class without the use of digital tools (Table 4.1) was low compared to the group of students' who were engaged in the virtual class with the use of digital tools (Table 4.2). This showed that digital tools increases the motivation of the students' to learn and hence a better level of attention.

Calmness and orderliness in classroom during the virtual teaching

Table 4.3: Calmness and orderliness in class (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	36	72.0	72.0	72.0
	Good	14	28.0	28.0	100.0
	Total	50	100.0	100.0	

Table 4.4: Calmness and orderliness in class (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	11	22.0	22.0	22.0
	Very good	39	78.0	78.0	100.0
	Total	50	100.0	100.0	

The orderliness and calmness in the virtual classroom also differe between the two groups of students'. The first group (Table 4.3) showed a pretty disorderliness in the classroom. A class with disorderliness or lack of calmness is an indication that the students' are not enjoying the class, which brings lack of attention and hence class disorderliness. The second group students' (Table 4.4) exhibited more calmness and orderliness during the class. The orderliness and calmness observed was due to the fact the digital tools increased the interest of the students' in learning and as such they were ready to learn, thus exhibiting calmness.

Answer to the questions of the teacher by the students' in the virtual class

Table 4.5: Answer to the questions of the teacher (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	30	60.0	60.0	60.0
	Good	20	40.0	40.0	100.0
	Total	50	100.0	100.0	

Table 4.6: Answer to the questions of the teacher (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	13	26.0	26.0	26.0
	Very good	37	74.0	74.0	100.0
	Total	50	100.0	100.0	

Rate of response to the questions asked by the teacher during the class also varied between the two groups of students'. The first group of students' taught without digital tools (Table 4.5) showed low level of response to the questions being asked by the teacher. Low response is an indication that the students'

were not really understanding what was being taught because of lack of motivation and interest during the class, but the second group of students' (Table 4.6) on the other hand showed a high level of response to the questions being asked by the teacher during the class implies that the students' were following what the teacher was teaching because the digital tools used improved their motivation and interest learn to learn.

Asking of questions by the students' during the virtual class

Table 4.7: Asking of questions by the students (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	28	56.0	56.0	56.0
	Good	22	44.0	44.0	100.0
	Total	50	100.0	100.0	

Table 4.8 Asking of questions by the students (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	15	30.0	30.0	30.0
	Very good	35	70.0	70.0	100.0
	Total	50	100.0	100.0	

During the virtual class by the first group, the students' showed low engagement (Table 4.7) in the class. The low engagement is due to the fact that the students' lacked motivation during the class, they did not showed lots of interest which affected their rate of understanding during the class, and as such few questions were being asked. The students' in the second group were actively involved in the class by asking questions (Table 4.8), this high level of engagement by the students' signifies that the students' were motivated and interested in learning due to the use of digital tools.

Doing of tasks given by the teacher during the virtual class

Table 4.9: Doing the tasks given by the teacher (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	33	66.0	66.0	66.0
	Good	17	34.0	34.0	100.0
	Total	50	100.0	100.0	

Table 4.10: Doing the tasks given by the teacher (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	19	38.0	38.0	38.0
	Very good	31	62.0	62.0	100.0
	Total	50	100.0	100.0	

Participation in tasks given during the course of the class by the teacher also received different levels of attention during the virtual class session. The first group of students' showed low level of participation (Table 4.9) during the class session, due to the fact that there was no motivation to learn but the second group of students' actively participated in doing the tasks (Table 4.10) given by the teacher during the class because the digital tools increased their motivation to learn.

Activeness of the students' in group discussion during the virtual class

Table 4.11: Activeness in group discussion (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	36	72.0	72.0	72.0
	Good	14	28.0	28.0	100.0
	Total	50	100.0	100.0	

Table 4.12: Activeness in group discussion (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	20	40.0	40.0	40.0
	Very good	30	60.0	60.0	100.0
	Total	50	100.0	100.0	

The level of engagement in group discussion during the class was also low among the first group of the students' (Table 4.11), but there was an engagement in group discussion among the second group of the students' (Table 4.12) during the class. The reason for the difference in the level of engagement in group discussion between the two groups of the students' is that digital tools provides an avenue for self-learning and as such the students' were able to share among themselves what they were able to learn on their own during the class.

Taking notes of points during learning in the virtual class

Table 4.13: Taking notes of learning in class (without digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	31	62.0	62.0	62.0
	Good	19	38.0	38.0	100.0
	Total	50	100.0	100.0	

Table 4.14: Taking notes of learning in class (with digital tools)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	16	32.0	32.0	32.0
	Very good	34	68.0	68.0	100.0
	Total	50	100.0	100.0	

Taking down points during a class is an indication that students are learning new things. In this study, the first group of students were not taking down many notes (Table 4.13) during the class, which indicates that the students' were not learning new things as a result of lack of attention to the class because there were not motivated to learn. The second group of students' were seen to be taking notes down during the class because the use of digital tools gave them motivation to learn and gain new things in music.

Conclusions

The outcomes of this study shows the importance and need it incorporate digital tools into modern music education. The study showed that students' who were engaged in virtual class using digital tools showed more attention and engagement which is significantly higher than the group of students' taken in virtual class without the use of digital tools. This significant difference is a confirmation that digital tools can change the perspective of students' to virtual class in music education. These tools gives students the opportunity to learn on their own and share their individual knowledge among themselves through an interactive platform provided by them. These tools also creates favorable learning environment for the students' which increases their level of attentiveness to class and engagement in class activities in a virtual classroom. This study lays emphasis on the use of digital tools in virtual music classrooms as it allows for more effective learning due to the high level of attentiveness and engagement of students' in the class. Another area for further research is going into detail of how digital tools improves self-learning in students'. This is important as students' tend to learn more on their own because they learn at their own pace.

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