Using ICT in the Teaching and Learning of Music in the Colleges of Education During a Pandemic Situation in Ghana

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ABSTRACT

With the introduction of Information and Communication Technology (ICT) in education, teachers and students can now engage in teaching and learning in new ways. It has given schools the ability to ensure that teachers and students have access to instructional resources both in and out of the classroom. The goal of this article is to look into how music tutors and student teachers in Ghana used ICT technologies in music sessions, as well as the problems that virtual teaching and learning encountered during the Covid-19 pandemic. With a case study as the research design, a mixed method research paradigm was applied Data was gathered using methods such as interviews and questionnaires. Scheduled phone calls and Google forms were used to collect data. The study found that ICT methods were the best way to keep teaching and learning going during the covid 19 pandemic, when schools were temporarily locked down, but there were significant problems. As a result, it was suggested that all music tutors and student teachers receive some training in the use of ICT tools. At addition, authorities in Ghana's colleges of education should make virtual interaction a part of the educational process to eliminate distance as a barrier to learning.

INTRODUCTION

Teaching and learning in schools in the world have been made easy through numerous channels and modes such as online, face-to-face, seminar, practical activity, eLearning among others. In Ghana, although all these mediums were being used to facilitate teaching and learning in the educational sector, the most used is face-to-face. This explains why, according to the researchers, 95 percent of the teaching and learning in Ghana's colleges of education was done face-to-face, with the tutor or facilitator presenting lessons in person (Aboagye, 2021). In Ghana's 46 colleges of education, this has been the tendency in the teaching and learning of all subjects read, including music.

In December 2019, the novel coronavirus (COVID-19) emerged in Wuhan city of China (Chahrour, Assi, Bejjani, Nasrallah, Salhab, Fares, & Khachfe, 2020). This initial outbreak of COVID-19 in Wuhan sprang rapidly, affecting other parts of China and other countries in the world (Sahu, 2020). Data from the World Health

Organization (WHO) pointed out that, this virus infected thousands of people all over the world with a lot losing their lives. Unhale, Ansar, Sanap, Thakhre, Wadatkar, Bairagi, Sagrule, & Biyani, (2020) disclosed "Coughing and sneezing without covering the mouth can disperse droplets into the air, touching or shaking hands with a person who has the virus can pass the virus between individuals, making contact with a surface or object that has the virus and then touching the nose, eyes, or mouth." Thus, these were the possible means this virus could be transferred from one person to another.

Ghana recorded her first two cases on Thursday, March 12, 2020. On Friday 13th and 14th March, 2020, the country recorded four more cases, two respectively on each day. As a result, the President of the republic of Ghana Nana Addo Danquah Akuffo Addo on the 16th of March 2020, made a public announcement and imposed a ban on all public gatherings like conferences, funerals, festivals, political rallies, church services and Islamic worship which were all subject to review. Mustafa (2020) echoed that, efforts to stem the spread of COVID-19 through non-pharmaceutical interventions and preventive measures such as social-distancing and self-isolation have prompted the widespread closure of primary, secondary, and tertiary schooling in over 100 countries in the world which Ghana was no exception. The president of the republic of Ghana shut down all schools and universities, both public and private in March 2020.

This was in line with precautionary measures put in place to warrant public safety and security for Ghanaian school going citizens. Barrett tells us, as cited in Mustafa (2020) "In response to school closures, Universities recommended the use of distance learning programs and open educational applications and platforms that schools and teachers can use to reach learners remotely and limit the disruption of education." Ghana adopted the same strategy for the various levels through the usage of social media, television, radio, internet among others. All 48 Colleges of Education in Ghana had no option than to embrace this idea regardless of its advantages and disadvantages. For this reason, the Transforming Teacher Education and Learning (T-TEL) project, partnered the managements at the colleges of education to enrolled tutors across the country on a short online course organised by Amsterdam University of Applied Science, Digital Society School to equip them technically in ICT to deliver lessons online. Though the virtual workshop for tutors came off as scheduled, not all college tutors in Ghana were able to enroll to undergo the training due to network and other related challenges. More so, the Ministry of Education in Ghana was unable to organize ICT training to also equip students to be able to effectively participate in the teaching and learning that would go on online on the various platforms. Consequently, a preliminary survey by the researchers indicated that 70% of the student teachers of Colleges of Education were unable to access lectures and do assignments as expected. For this reason, there was the need to investigate how tutors and student teachers used ICT in the teaching and learning of music lessons and the associated challenges thereof. The study is guided by these research questions;

1. How are tutors incorporating ICT into their music lessons?
2. How are students incorporating ICT into their music education?
3. What are the challenges of employing ICT technologies in music education and learning?

LITERATURE REVIEW

Teachers using ICT in teaching Music

The introduction of Information and Communication Technology (ICT) into the educational system has been hailed as a major catalyst of the long dreamed-about educational revolution (Hoyle, 1983), especially as ICT is designed to serve as a major vehicle for improving the efficiency of the educational process (Jones & Knezek, 1993). The 21st century education system in Ghana cannot overlook the numerous benefits that ICT brings to the classroom as far as teaching and learning is concerned. Information and communication technology has become a cross-cutting issue as far as teaching curriculum of colleges of education in Ghana is concerned. The current 4-year Bachelor of Education curriculum used by colleges of education enshrines the use of ICT tools in the teaching and learning across all courses and subjects within a programme of study. Students are trained with the focus of equipping them with professional value and attitudes, professional knowledge and professional practice to teach at the Ghanaian basic and junior high schools.

The teaching of music remains an important subject in Ghanaian basic and junior high school

curriculum, as it affords teachers to teach pupils to appreciate the culture and values of the Ghanaian society through music. For this reason, student teachers at the colleges of education are trained in music education to be able to impact the same knowledge to the pupils at the basic and junior high schools. College tutors do not teach music in isolation, they integrate some ICT tools like the use of computers, projectors, application softwares and other multimedia to make the teaching of the course interesting to student teachers. Wiggins (2003), beliefs about the careful selection of musical content and diligent planning are central to effective music teaching. However, certain models of classification may need redefining as teachers and pupils discover the creative potential of new technologies. Teaching music with ICT allows pupils to generate, explore and refine musical ideas with a speed of discovery that is beyond that which is achieved by conventional approaches. According to Savage (2005), one of the largest changes brought about through the use of ICT in the music classroom is in relation to the procedures for assessing students' work. A vital part of assessment is recognising the effect of ICT on the students' creative work and to discuss with the students the effect of this on their working process with the piece of technology (Savage, 2002). The current B.Ed curriculum encourages the use of ICT and should facilitate a teaching style that allows for the integration of the curriculum elements of performing, composing, listening and appraising in music education. In his work, Eisner (2002) challenges art educators the need to integrate technology as he suggested that;

> *The development of computer technology has suggested to many that the computer can become a technology of unparalleled importance in the arts. What does such a vision imply for the creation of school programs in the arts? What does a computer allow students to do with images that other technologies don't, and what might such a resource mean for the development of cognitive skills? (Eisner 2002, p.41).*

It is worth noting that creating educational situations in which students can imbue their personality, character and creative spirit is the key for teachers. The curriculum framework of creative ideas for the use of ICT in the classroom is as, if not more, important than the pieces of technology themselves. The Ghanaian curriculum in schools might not focus primarily on ICT integration and so the Department for Education and skills (DFES) makes it evident that;

> *For many schools the main focus of activity following installation of networked ICT infrastructure was on teaching ICT skills. Cross-curricular use of ICT is difficult for secondary schools to achieve because ICT has traditionally been a specialist subject for GCSE. A major shift in culture and established practice is involved in the introduction of ICT within subject teaching (DfES 2002, p.19).*

The use of computers and mobile devices in music education is based on the reproduction of audio and video, as well as the execution of simulations and presentations, and the search for information (Gorgoretti, 2019).

Students using ICT in learning Music

School teachers or pre-service student teacher institutions relate with a new generation of students who are growing up with technologies as ubiquitous equipment, for instance, ICT tools (Tondeur, Siddiq, Scherer & Baran, 2017). Students all over the world have driven for the use of ICT tools in varied aspects of their lives. Many students have narrowed the learning of music as a course with the use of musical instruments like trumpet, piano, drum, guitar etc. The narrative is changing as students are now realising the power of technology in their studies. Students now learn to play piano as a musical instrument from their mobile devices as these devices have applications softwares which facilitate the learning of these instruments. The creative use of ICT can, and perhaps should, resituate musical practices within the world of the digital arts. An integrated arts or multimedia approach to musical performance and composition with ICT may engage and motivate students more successfully, facilitate the development of their creative skills and bring about a greater sense of personal aesthetic awareness (Savage 2005). In the context of Central-Western zone (centwest) colleges of education, Ghana, simulation is part of student teachers' training and accounts for 40% of the curriculum. In simulating a real primary/basic school classroom situation, student teachers engage in micro teaching to teach the use of musical instruments. Student teachers make use of video recording devices like smart phone camera, camcorders to record their micro teaching for assessment purposes. The student teachers have a task of uploading an instructional video on YouTube by applying the

theories, strategies, approaches, and application of ICT-based learning media that has been previously studied and discussed. After that, the tutors provide reviews or clarification of the students' tasks. Besides, the student teachers have a role in evaluating the video recording of other student teachers (peer assessment), these practices afford them the opportunity to integrate ICT in the teaching and learning of music. All these are accomplished in the music class through the use of ICT tools. A study in 2012 indicated that students' use of ICT in school is a crucial predictor to students' ICT use for learning and in other leisure activities. Although students may have different perceptions toward computer use in school, a study by Yuen and Park (2012) indicates students have a relatively positive view of the use of ICT for learning and may have accounted for student teacher's enthusiasm to explore using ICT tools in learning music in recent times.

Challenges associated with using ICT in teaching and learning Music

Music education has been implemented as a compulsory subject in primary school by Ghana Education Service since the 90s. Music was introduced into the Ghanaian school curriculum by colonial missionaries in propagation of the gospel and their respective doctrines. Although the Ghanaian school curriculum has undergone several reforms, music is still taught at all levels of education. The curriculum elements in the colleges of education music curriculum intend to give opportunities to the students to experience and appreciate music and at the same time, giving the basic understanding of basic musical concepts. Since the introduction and its subsequent implementation, music education has gone through many changes especially in the recent 4-year Bachelor of Education (B. Ed) curriculum. These changes have come in various innovative ways of integrating technologies but these changes have been possible without challenges that it poses to teaching and learning of music using ICTs. Since the last decade, information and communication technology (ICT) has been the subject of several pedagogical discussions, according to Calderon Garrido, Carrera, and Gustems Carnicer (2021). (Adelsberger et al., 2013). It is very vital for instructors to understand and use it (Carrera et al., 2018). This is because, as UNESCO (2012) points out, it is not only an important aspect of the teaching–learning process, but it also has an impact on how students use material outside of class. As cited in Nmadu & Onwuekwe (2021), there are obvious concerns with equipment storage or providing access to a room with enough space for a keyboard, computers, speakers, and other items; nonetheless, for many of the institutions under investigation, this is the most difficult challenge. The cost of installing music technology equipment and facilities in the classroom would be borne by schools, parents, the government, and others. Hence External considerations such as the following are cited by Elliot (2004), Savage (2007), and Dorfman (2008) as reasons why technology is not employed in classrooms: (i) Insufficient financial support. (ii) Inadequate hardware and software provision. (iii) Lack of space in music room. (iv) Requires new approach to classroom management. (v) Technology for music education is insufficient. (vi) Anxiety-strategy planning investments are needed to implement the use of technology in music learning.

''Music instructors find it challenging to successfully introduce computers into their music curriculum," writes Syal in Onyiuke (2009), as cited in Nmadu & Onwuekwe (2021). They frequently use a hit-or-miss approach to integrating computers into their classrooms." (See p. 104). According to Olapade & Omole (2018), music educators may find it difficult to successfully implement the use of music technology because it is not included in the music education curriculum. The music teachers interviewed argued that ''courses like introduction to modern technology, which focuses primarily on music software, were supposed to have been incorporated in the course. They go on to say that the training may have prepared them for similar issues in the future." (see p. 235)

According to Li, Li, and Han 2021, performing arts educators must develop a new approach, citing earlier studies such as Draper and Hitchcock (2008), Crawford (2016), and Ostashewski et al. (2016). To lessen the negative impact of the COVID-19 epidemic, it uses traditional blended learning and combines it with extra innovative techniques to boost teaching and learning experiences.

Bauer et al. as stated Eyles, (2018) opine that there are lot of benefits when teachers are able to upgrade professionally in at least three fundamental elements, i.e teacher knowledge, teacher confidence and frequency practise of skills. However, in the contest of the Ghanaian College Tutor, the researchers observed that, there has not been adequate training for tutors of colleges of education as well as student teachers on the use of ICT tools in the teaching and learning of music. Meanwhile, there was COVID-19 which restricted movements and necessitated the use of ICT tools as a medium for instruction remotely. Again,

Hixon & Buckenmeyer and Norris et al. in Eyles, A. (2018) made a strong point which touched on the accessibility of ICT resources to the key stakeholders in teaching and learning at the Colleges (the Tutor and the Student Teacher). Contrary to that, although ICT tools were used in the colleges, it was rare. The reason to this was the unavailability of most of the ITC tools at the various colleges of education. The above concepts are very relevant to remote teaching, giving the emphasis that, to use ICT tools effectively and efficiently , Tutors and student teachers must have a thorough professional training for the acquisition of requisite ICT knowledge and skills and resources needed, made available to aid the teaching and learning process.

RESEARCH METHOD

Research Model

In this study, a mix method which made use of interview and questionnaire as a research instrument was used. A descriptive study was employed, which focused on Colleges of Education within the Central-Western zone (centwest), ie Bia Lamplighter, Our Lady of Apostle (OLA), and Holy Child Colleges of Education out of the 46 Colleges of Education in Ghana. These Colleges were chosen because, at the time of the research, they were the only Colleges who were offering Music as elective and were teaching it online due to the pandemic

Participants

The population for this study included the Music tutors and all music student teachers studying music in the aforementioned Colleges. A convinient sampling technique was used to select the only music tutors from each of these colleges for an interview. This is so, because as at the research period, the Colleges in the study only had one music Tutor each. On the other hand, a random sampling technique was used to select student teachers from the participating colleges, who are reading music as a course of study.

Table 1. *Participating Colleges, number of student teachers and, gender composition and levels of study*

		N
Colleges	Bia Lamplighter CoE	15
	Holy Child CoE	12
	OLA CoE	3
Gender (Students)	Male	10
	Female	20
(Tutors)	Male	3
	Female	0
Levels of Study	Level 100	10
	Level 200	12

Data Collection Tools

All student teachers selected for the study responded to an online questionnaire (Google forms) while the respondent tutors were interviewed via scheduled phone calls. The phone interviews were recorded simultaneously, which enhanced the accuracy of what the researchers gathered from the interviewees. There was the need to use online questionnaires and phone interviews due to one of the major safety protocols of the COVID 19 pandemic that demanded social distancing during the period.

Collection of Data

To certify careful collection of data for efficient analysis, questionnaire and interview guides were developed and used to ensure reliability in the data collection which facilitated the description of the use of ICT in teaching and learning of music in the course of the pandemic in the selected Colleges of Education. The study lasted for only one semester, which was the second semester of the 2019/2020 academic year.

Data Analysis

Data collected was analysed qualitatively and quantitatively. Qualitatively, the researchers transcribed audio recording from participants' phone interview and further developed them to categories and theme

which were used to identify differences and similarities in response. The data collected from student teachers were coded in spreadsheet application and was analysed quantitatively in basic statistical frequency tables using jamovi project (2020).

Validity and Credibility

In order to determine the reliability of instrument for this study, the questionnaires for student teachers were pilot-tested with 15 students from Wiawso College of Education and the data was analysed using *jamovi* (Version 1.2.5.0) to check for internal consistency as well as the suitability for the study. The outcome of the analysis produced a Cronbach's alpha of 0.882.

Table 2. *Reliability Analysis*

Scale Reliability Statistics	Cronbach's α	0.882

FINDINGS

In a quest to find answers to the research questions, the researchers administered questionnaires through Google forms, interviews with some music tutors at the three colleges of education and the results of the data analysis is presented below.

Research Question One: How are music tutors using ICT in teaching Music during the Covid 19 pandemic?

It was asserted by music tutor respondents that ICT tools have really enabled interaction with student teachers of colleges of education during the COVID 19 pandemic. This is because the gap the pandemic created has opened music tutors' eyes to virtual learning where student teachers can be far but access lectures synchronously or asynchronously once they have the requisite knowledge and skills and own ICT tools.

Most of the music tutors who were respondents in this study admitted that they had some ICT knowledge and skills which enabled them to manipulate ICT tools for the purpose of lesson delivery. The music tutors explained they became familiar with ICT tools through the use of the internet, workshops, seminars, self-tutorial, and colleagues. It is also good to know that all participants had ICT available on their respective campuses where they were able to access whenever they required, but with various challenges. Some of the software these tutors were familiar with were zoom, Microsoft office (word, power point, excel), finale, WhatsApp, telegram and book widest.

It has been indicated that in the teaching of music virtually, ICT tools were the most appropriate and available means tutors could reach their students during the COVID 19 pandemic, where lockdown and social distancing were enforced across the country. Basically, music tutors in this study adopted various platforms such as Google classroom, telegram, WhatsApp, zoom, google meet and screen cast with the help of ICT gadgets such as laptops, desktop computers, smart phones and tablets. the following were some responses from some tutor respondents in this study:

> "Google classroom is the main medium I used for the teaching process, however I used WhatsApp to explain certain things to students who did not understand certain concepts. For google classroom, when you put an information there for student teachers, it doesn't give them notification, as in real time notification, hence students don't get prompts, unless they go there."

> "I used ICT tools like zoom, WhatsApp, phone, laptop and computer. I downloaded notes from the net and also used the gadgets to send materials. I also used ICT to prepare my lesson proforma (teaching plan) by checking definitions, jargons in music as well as checking correct spelling of some musical terminologies."

When tutors were asked how they used ICT tools to prepare for online lecture, a respondent echoed:

> "I use the slide in preparing lessons for presentations online, also I used Google forms to prepare my questions for assignments and quizzes. I also use Google meet whenever I want to have a video section with student teachers. In addition, I used the word processor application to prepare my pro forma

(lesson plan). I also used Microsoft office (word) to prepare my quiz questions but in a Google form where I provided rubric and the system marked and gave deserving marks instantly, normally in the objective form. Searching for information, I used the internet to assess articles and journals and introduced some websites where students can visit for music related information. I was also able to give student teachers links to watch videos before the lecture."

These ICT tools mentioned by the tutor respondents were basically used to prepare lesson proforma (lesson plan), lesson note, assessment and deliver music lessons. More so the ICT tools were used to download teaching learning materials in the form of pictures, audios and videos which were used to prepare lessons and facilitated virtual teaching as well. Out of three sampled Colleges of Education for this study, only one college had a Learning Management System of their own which tutors were using. Another one had adopted a Learning Management System but not in use at the time of this research.

According to respondents, management were running workshops for tutors for acquaintance and further use for the virtual platforms for teaching and Learning in the College. The other two colleges who did not have a functional Learning Management System were hooked onto that of their affiliated institutions, (University of Education, Winneba and University of Cape Coast, Cape Coast), where both tutors and student teachers were enrolled and lessons delivered there. Unfortunately, workshops and seminars held by the affiliate institutions to train tutors to use their system did not go down well, said the respondents. More so, 80% of the student teachers were also not able to access these learning management systems hence it was almost abandoned. For this reason, each individual tutor used a platform that was convenient for him and the student teachers. The platform which 90% of the tutors and student teachers were very familiar with and used was WhatsApp. In teaching music lessons online, audios, pictures and videos were sent to students on their lecture platforms in advance to listen, view and observe before discussing during the instructional period. Music tutors who participated in this study, used ICT tools to assess students through the use of the smartphones and laptop computers. Tutors used these devices to make questions available to students either by typing or used voice notes and students brainstormed and answered them via the same means. As and when necessary, the music tutors also uploaded videos and audios in consonance with the lesson being delivered to throw more light in the course of the lecture. Also, course outlines, lesson notes, other reading materials and website links were forwarded to student teachers through the use of ICT tools onto their lecture platforms.

Equally important, ICT tools helped music tutors to document vital information. This information was stored on pen drives, and in folders on the computer as well as in their mails on the internet. In addition, the use of ICT tools changed the way tutors accessed libraries when searching for music related information for teaching. Tutor respondents revealed that, instead of going to the traditional library personally to read, they were able to access information with the help of ICT tools in the comfort of their home. The respondents assert that they visited databases that had literature in music. Besides, there were a lot of online music libraries where recent literature became readily available for their use. Tutor respondents further made it clear that some of the music books, which were used for teaching could not be found in the libraries of colleges in this study, hence tutors resorted to online search which saved time and stress.**Research Question Two: How are students using ICT in learning Music?**

Table 3. *Gadgets Own by Respondents*

Description	Frequencies				Total
	Yes		**No**	**%**	
Laptops	9	30.0	21	70.0	30
Desktops/personal computer	8	26.7	22	73.3	30
Mobile with internet facility	23	76.7	7	23.7	30

From table 3, it was evident that the majority of the respondents (23) representing 76.%, own mobile devices with internet facility. Few respondents, (n=8 26.7%) and (n=9 30.0%) owned desktop and laptop computers respectively.

Table 4. *What was the Mode of Lecturing in Music before the Covid 19 pandemic?*

Mode of Lecturing	Frequencies				Total	%
	Most	Sometimes	Rarely	Never		
Face-to-face	21 (70.0%)	5 (16.7%)	1 (3.3%)	3 (10.0%)	30	100
E-mail	5 (16.7%)	6 (20.0%)	9 (30.0%)	10 (33.3%)	30	100
Mobiles	10 (33.3%)	15 (50.0%)	3 (10.0%)	2 (6.7%)	30	100
Forums	3 (10.0%)	11 (36.7%)	10 (33.3%)	6 (20.0%)	30	100
Chat	12 (40.0%)	9 (30.0%)	5 (16.7%)	4 (13.3%)	30	100

The data presented in table 4 indicates that most student teachers 21(70%), were using face-to-face for their music lessons. Some student teachers 9(30%) rarely used emails as a medium for lessons. An appreciable number of them 12 (40%) mostly used chat platforms for lessons. Mobile phones were sometimes used to access lessons and some 10 (33%) rarely used forums for lessons/lectures.

Table 5. *Change in Interaction Due to Covid 19 Pandemic*

Statement	Frequencies					Total
	SA	A	N	DA	SDA	
Tutors used innovative ICT tools for teaching and encouraged you to use ICT for learning	13	12	2	3	0	30
Tutors suggest e-content for supplementary reading.	6	20	1	2	1	30
Tutors allow submission of assignments through email.	15	9	3	2	1	30
E-groups within your class are used to make announcements and to arrange for meetings.	14	11	4	1	0	30
ICT has enabled interaction with fellow students through the internet.	17	12	1	0	0	30
Tutors provide softcopy of the study material for further reading.	19	10	0	0	1	30
ICT enabled contact with teachers and students 24 x 7 for study related activities.	8	9	5	6	2	30
Frequency of interaction with Tutors increased due to ICT tools.	7	16	2	3	2	30
ICT tools helped you to overcome inhibitions to interact with Tutors and colleagues.	9	19	0	2	0	30
ICT tools helped you to document and share learning materials.	15	14	0	0	1	30
ICT changed the way you access library	11	17	1	1	0	30

Data presented in table 5 revealed that 13 and 12 student teachers strongly agreed and agreed respectively to the statement that their tutors used innovative ICT tools in teaching and learning and encouraged them to do the same. Twenty-six (26) student teachers out of 30, agreed that tutors suggested some e-content materials to supplement their readings. Again, 24 student teachers agreed that tutors allowed submission of assignments through electronic mails, 25 also agreed using electronic groups to arrange online meetings and making announcements, 29 agreed that, the use of internet has enabled peer interaction during the COVID19 era, 17 of them agreed that using ICT tools during the period enabled them stayed connected with their tutors and 27 of them agreed that the use of ICT tools during the pandemic changed the way they accessed library resources.

Table 6: *Through What Means Do You Access Your Virtual Lecture in Music?*

Statement	Frequencies				Total
	SA	A	DA	SDA	
WhatsApp	24	6	0	0	30
Facebook	0	8	17	5	30
Instagram	2	6	15	7	30
Zoom	6	9	12	3	30
Google meet	8	8	10	4	30
Others	2	16	8	4	30

Table 6 revealed that all 30 student teachers who responded to the instrument used WhatsApp platform to access online music lectures. 22 of them disagreed using Facebook platform to access online music lectures. Again, 22 of them disagreed using Instagram to access online music lectures, while 15, 16 and 18 used Zoom, Google meet and other online platforms to access online music lectures respectively.

Table 7. *Music Lesson with ICT Tools, Students Experience*

Description	Frequencies				Total
	SA	A	DA	SDA	
Music lessons with ICT tools are topical, comprehensive and exhaustive	12	14	3	1	30
Do you think the ICT tools used for music lessons will help improve your knowledge/skill levels in music?	10	8	6	6	30
Do you think the content presented with ICT tools covers every topic in what you are supposed to learn?	13	9	3	5	30
Do you think that ICT tools used by your tutor are user friendly to enhance learning?	12	8	7	3	30

Table 7 revealed that 12 and 14 respondents strongly agreed and agreed to the statement that music lessons with the use of ICT tools are comprehensive, topical and exhaustive. 18 respondents again agreed that ICT tools used for music lessons helped them to improve their knowledge and skills in music lessons. 22 respondents further agreed that ICT tools help cover content they were supposed to learn. 20 respondents agreed that ICT tools used by tutors for music lessons are user friendly.

Research Question Three: **What are the challenges associated with using ICT tools in teaching and learning Music?**

Although ICT tools were used by respondents (Tutors) to deliver lessons, this study unravelled some major challenges in the integration of ICT in the teaching and learning of music virtually, with respect to the Colleges of Education used in this study.

Poor Internet Connectivity and Electricity Failure

In the first place, non-reliability of internet connectivity and unreliable source of power on the various campuses as well as in the homes of student teachers was a major challenge. Respondents stated that, on many occasions, in the middle of a lecture, the network goes off. In some cases, reconnecting was possible while in other cases the lesson ended abruptly. In some instances, the whole day, there may be a light out, meanwhile the ICT tools they were using required electricity to sustain their usage. These disturbed outright continuities and made lessons boring.

Lack of ICT Knowledge and Skills

Tutor respondents agreed that, due to the COVID 19 pandemic, they switched to online teaching. However, majority of them did not have adequate knowledge and skills in ICT in order to use the ICT tools efficiently for their lesson delivery. As a result of this, 70% of the tutors in the study found it very difficult to navigate their way in using the ICT tools required for online teaching efficiently. On this account, a respondent confirmed that there were some of his colleagues who have never participated in virtual teaching during this period because they lacked adequate knowledge and skills to use the ICT tools. He said some of these tutors did not even own some of the basic ICT tools such as laptops and smartphones. Even among this group of people, those who have basic ICT tools lacked the requisite knowledge and skills to use them for lesson delivery.

Time Consumption and Health implications - stress

Advance preparation to make lessons precise and concise was very stressful and consumed a lot of time because tutors had to search from several sources and put into soft copies before the contact period. In addition, during lessons, uploading information for student teachers was a bit problematic due to poor connectivity which made it very slow in completion, thus consuming a lot of time. A Respondent mentioned "Sometimes when you log in, the system itself will log you out. Before you reconnect and hook up with students again, the time will be far spent." A real case is when, in an attempt to leverage formative assessment mode during lessons interacting with student teachers, tutor type questions and post them on lesson platforms, awaiting responses from student teachers and the response from student teachers takes forever due to poor connectivity. In an instance where responses from student teachers are delayed as a result of poor connectivity, it introduces an abrupt break and delay in the teaching process, thereby wasting instructional periods. Unlike the face-to-face where discussions and formative assessment questions and answers were done verbally, the same cannot be said about online teaching and learning. The intermittent break in the lessons/lectures as a result of poor internet connectivity was a worry to both tutors and student teachers alike. Teaching with ICT tools was also stressful for some music tutors because they were not able to navigate around some application softwares used in lesson preparation, hence struggling through from the preparation period through to lesson delivery. As numerous hours were spent on lesson preparation and lesson delivery amidst poor connectivity, some tutors experienced neck, shoulders, arm, eyes and back pains due to longer hours spent in using ICT tools like the phones and the laptop which exposed them to injuries that may create a life-long effect on their health.

Increased Expenses

Getting data has become a bone of contention between institutions and individual tutors. Some colleges which did not have internet facilities on their campuses were giving internet data to tutors but stopped along the line. In one of the colleges sampled for this study, tutors were not given internet data at all, making it a financial burden on the tutors. Tutors spent a lot of money purchasing internet data to search and download information, audios, and videos and as well engage student teachers online. This resulted in an unplanned expenditure on each of these tutors, as several ICT tools like the phone, laptop, tablet, and pen drive among others were purchased for teaching online. These increased financial expenses of tutors.

Lesson Coverage

Poor internet connectivity which caused delays and disruption in lesson delivery, did not allow for an extensive coverage of lessons during contact hours. This was because there was pressure on music tutors to finish their course outlines with limited time at their disposal, hence tutors were forced to summarise most of the units covered. More so, lack of ICT skills on the part of students made them not to ask questions bordering them. This was because, for many of the student teachers, this was the first time of committing to extensive use of ICT tools in learning, hence they are unable to navigate around the recommended application softwares as well as their online learning platforms. This made it very difficult for tutors to know whether student teachers understood concepts or not. A respondent mentioned that "I have just one hour to complete a three-credit hour lesson. This mounted pressure on the tutors and made lesson discussions inexhaustive."

Poor Monitoring

Monitoring was key in ensuring that tutors were engaging student teachers and student teachers were also attending online lessons. It was worth bringing to light that some student teachers came into the online class for the sake of attendance. This meant that such student teachers left after the roll was checked. The virtual nature of lessons and attendance checking did not allow tutors to see all student teachers physically (face-to-face). Due to this, tutors could not ascertain whether it was a genuine factor that took students off the platform during lessons or merely a prank. Music tutor respondents in this study stated that they had never had the full complement of the student teachers during the online lessons. A respondent stated that students' attendance to online lessons was mostly very poor. He said "out of 400 student teachers that I teach, only 36 (9%) access lessons synchronously. The rest, some access asynchronously while others did not even visit the online platform at all."

Lack of Equity

Also, tutors mentioned that some student teachers complained they were unable to navigate their way around the learning management system hence were not able to access information uploaded. Most of these students did not have the requisite ICT knowledge and skills with which they could interact with, using the ICT tools available. Furthermore, some student teachers did not own smartphones, lacked access to internet connectivity, could not access financial support to purchase internet data, which made them miss vital information during online lectures and were left behind. This undermined the quest to parade equity in our educational system. This rendered some student teachers at a disadvantage. It was observed that asynchronous or recorded lessons/lectures did not consume much internet data, as a result most students prefer asynchronous to the synchronous due to its associated disruptions. Meanwhile during synchronous lessons/lectures, one could ask questions about concepts he or she did not understand and also make useful contributions which other student teachers may leverage to understand lessons.

Student teachers who participated in this study have the following as some associated challenges in using ICT for their music lessons.

Table 8. *What is the Main Hindrance for Integration of ICT in the Music Teaching-Learning Process?*

Description	Frequencies					Total
	SA	A	N	DA	SDA	
Lack of Time	5	14	2	3	6	30
Not interacting face-to face with people	8	8	4	6	4	30
Owning ICT tools are expensive	13	8	0	5	4	30
Non-reliability of online content	9	9	2	7	3	30
Lack of skill to handle the ICT tools for learning	6	12	1	7	4	30

In table 8, it was evident that 19 respondents hinted that lack of time is a hindrance to integration of ICT in music lessons, 16 respondents also agreed that not interacting face-to face with people was a hindrance to integrating ICT in music lessons. Again, 21 respondents agreed that owning ICT tools is expensive, while 9 of them disagreed. 18 respondents agreed that non-reliability of the internet was a hindrance in integrating ICT in music lessons. Again, 18 respondents agreed that lack of skill in handling ICT tools for learning was a hindrance to integrating ICT to music, while 11 of the respondents disagreed.

Table 9. *Disadvantages of using ICT for teaching and learning*

Description	Frequencies					Total
	A	A	NO	DA	SDA	
Addiction to the technology	1	13	10	1	5	30
Not interacting face to- face with people	6	12	6	4	2	30
Stress	4	13	4	6	3	30
Increases expenses	11	8	4	6	1	30
Information overload	10	8	5	4	3	30

Table 9 revealed that, 14 respondents agreed to the assertion that technology addiction is a disadvantage in using ICT for teaching and learning, 6 of them disagreed, while 10 of them have no opinion to that assertion. Again, 18 respondents agreed that not interacting face-to face with people was a disadvantage in using ICT tools for teaching and learning. 6 respondents disagreed, while 6 of them did not have any opinion on the statement. 17 of the respondents agreed that stress was a disadvantage in using ICT tools in teaching and learning, 9 of them disagreed, while 4 of them did not have any opinion on the statement. 19 respondents again agreed that increase in expenses is a disadvantage to using ICT in teaching and learning, 7 respondents disagreed, while 4 of them did not have any opinion to the statement. Furthermore, 18 respondents agreed that information overload was a disadvantage to using ICT tools in teaching and learning, 7 respondents disagreed and while 5 respondents did not have any opinion.

DISCUSSION AND CONCLUSION

It was evident from the findings (Table 1) of this study that student teachers, prior to the pandemic situation, own some electronic devices such as laptops, desktops and smartphones but majority of the respondents owned and used mobile devices for lessons. Due to this, the use of WhatsApp applications for accessing online lessons among student teachers was common, while few student teachers occasionally resorted to platforms like Google meet, zoom, Facebook, and other platforms for their online lessons in music during the pandemic. Again, findings presented in table 3 indicated most student teachers were using the face-to-face but complemented in some few cases, ICT tools like email, chat, forum and mobile devices for their music lessons/lectures.

As cited in Marcy (2004), that technology increases the potential for students to have a variety of learning environments, from simulated role-playing to problem solving to interactive dialogue. The various software programs have the ability to respond to a range of learning styles and varying degrees of student sophistication while allowing students to learn at their own paces. Student teachers' use of ICT tools for music lessons became even more prominent during the pandemic situation and data in table 4 affirms various ways student teachers explored ICT tools to access and create content for music lessons. In spite of these positive experiences shared by some student teachers, these challenges were evident; inadequate skill training to use ICT tools for music lessons, high cost of owning ICT devices like laptops, smartphones, and desktop computers to access lessons, lack of face-to-face interactions with colleague student teachers and tutors impacted negatively on some student teachers as the situation affected the academic engagements. Some students became overloaded and overwhelmed with e-content and e-engagement which was a stressful experience for most student teachers.

ICT tools are very essential to every music tutor in the College of Education in Ghana. Some of the ICT tools used by respondents in this study were laptop, smart phones, pen drive, music box, projectors and keyboard (piano). Therefore, a music tutor is expected to have adequate knowledge and skills in ICT to facilitate music lessons at the lecture hall in the College of Education in Ghana. Although music tutors in this study used ICT tools prior to the COVID 19 pandemic in facilitating music lessons, it was rare and optional to most tutors. However, the COVID 19 pandemic made the music tutors have no option than to resort to ICT

tools when it became necessary that education must go online. Hence the use of ICT tools became the greatest intervention amidst lockdown and social distancing in Ghana. With this being the most appropriate option, various ICT tools were adopted by music tutors to reach student teachers at the comfort of their homes and any other place they found themselves.

This 'new normal' form of teaching and learning helped some college music tutors and student teachers to upgrade their knowledge and skills in ICT as they got involved and were able to interact online by using various ICT tools. Some of the tools which were used were, laptop, tablets, desktop computers, Microsoft office applications, zoom, telegram, WhatsApp, Google meet and Google classroom. The most used among these tools was WhatsApp. This was because almost all music tutors and student teachers had such applications on their mobile phones. This made it possible for tutors to prepare and teach online and some students were also able to access lessons/lectures wherever they were, synchronously and asynchronously. Student teachers had access to audios, videos, voice notes and lecture notes from tutors. In addition, music tutors had an e-portfolio of students, which were soft copies of students' assignments submitted and stored for future references or archival purposes. Tutors were able to store their documents, pro forma (lesson plan), lecture notes and other materials in a soft copy form with the aid of ICT tools such as computer, pen drive, cloud storage among others. It has become evident in this study that the use of ICT tools by music tutors for facilitating music lessons motivated tutors to explore and enhance their knowledge and skill in ICT use and music as a course.

However, a few challenges were identified. These were poor connectivity and electricity failure, time consumption and stressfulness, increased expenses, poor monitoring, lack of equity, assessment and feedback and intense pressure. In view of these, the researchers made some recommendations which were stipulated in this paper. The gap created by covid 19 had become an eye opener, hence it is envisaged that the online teaching and learning system has come to stay. One benefit is that, even after COVID 19, wherever a music tutor may be, he or she can deliver his or her lessons virtually with the help of ICT knowledge, skills and tools. This has created another major platform and opportunity for which teaching and learning can take place.

The paper looked at how music tutors and student teachers used ICT tools in teaching and learning music in some selected Colleges of Education in Ghana. It was established that ICT knowledge and skills is an essential requirement for every music tutor and student teachers in the College of Education. Very critical was when the Covid 19 pandemic set in and the most appropriate means of facilitating music lessons were through the use of ICT tools. Thus, the interest of the researchers to investigate how both tutors and student teachers were using the ICT tools to teach and learn. A mixed research method was adopted. This was because of various advantages it had on the study especially in an era where movements were restricted. In view of this, the respondents in the study were reached through the use of ICT tools, that were through phone interviews and administration of online questionnaires through the use of Google forms.

Although some tutors did not have adequate knowledge and skills about ICT, they learnt to use the ICT tools as they manipulated and interacted with them. As a result, many virtual platforms were adopted to facilitate the teaching and learning process but only a few were used efficiently. The whole process of interaction pointed out some challenges which tutors and learners faced. Some of which were poor network, cost of internet data, stress among others. It has been recommended that all music teachers must familiarize themselves with ICT tools in order to access information online, prepare lessons, navigate easily when facilitating lessons online.

SUGGESTIONS

We recommend every music tutor at the College of Education as well as student teachers own some basic ICT tools, both hardware and software like laptops, tablets, pendrive, modem, Microsoft office application, mobile phones among others. These tools will increase their knowledge and skills in ICT as they manipulate them. An observation during this study showed that, in some colleges where tutors did not have their own ICT tools, it then required sharing the few the colleges had which delayed and wasted time because one tutor had to wait for another tutor to finish using it before he or she also used it. It also calls for college authorities to also provide enough ICT tools for teaching and learning in the colleges to avoid pressure on the

few.

Colleges of Education should develop or purchase their own learning management system. Training workshops should be incorporated into their continuous professional development sessions to build capacities of tutors to use ICT tools required for teaching and learning. Training for tutors can be done in smaller groups or tutors go in turns with social distancing being observed keenly to familiarize tutors and also upgrade tutors' knowledge and skills in ICT and the usage of its tools in navigating their LMS. In addition, colleges should have very strong internet connectivity with a very wide coverage to allow tutors and student teachers to access ICT tools effectively.

Tutors must also be motivated intrinsically and extrinsically by college management. At least, they should be given some allowance for Internet data where internet facilities are not readily available on campus. ICT courses must be intensified and made compulsory to expose student teachers to use ICT tools. There must be joint stakeholder engagement on the use of ICT tools for online teaching and learning and how colleges of education can leverage the benefits thereof during this pandemic situation to effectively and efficiently deliver teaching and learning even after COVID 19 pandemic.

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