

# Evaluation and Integration of ICT using Music Software in Music Education

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## Abstract

The primary goal of this research was to assist music education instructors in the integration of ICT into their classrooms and utilized music software. It also sought to get a better knowledge of how instructors made use of ICT, as well as to identify and evaluate their training requirements, as well as to assess the extent to which ICT was utilized in instructional programs. The researchers also looked at the obstacles that instructors encountered when integrating ICT into music education courses, as well as their perceptions of the technology's usefulness. This study utilized qualitative method and used written documents as where the researcher got the data. According to the findings of the study, technology helps to make the learning environment more alive and appealing. It will demonstrate how interactive music educational techniques and ICT tools were used in schools to teach music education and how they encourage the teaching of music education. It will also demonstrate how interactive music educational methods and ICT tools were used in schools to teach arithmetic.

**Keywords:** interactive instructional technology, information communication and technology, music software, music education, music teachers

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## INTRODUCTION

Contemporary education programs produced in response to educational needs that are student-centered, involve multiple sense organs, and target creativity and productivity are designed for teachers and learners who are interested in technology breakthroughs and are eager to learn. In this sense, the use of technology and technological resources is increasingly prominent in today's modern educational approach. Günay and Ozdemir (2012) stated that within learning-teaching contexts, questions such as "How can I learn?", "How can I teach easily?", and "How can I teach persistent knowledge and skills?"

could lead to the development of the concept of educational technology. In its report, it emphasizes the necessity of introducing information and communication technology (ICT) resources into schools as a tool and utilizing them as an efficient material within the teaching process.

There is no doubt that in order to meet the targets, instructors must first be educated as individuals who meet the technology criteria; who are at the very least competent computer users who are aware of technological changes in their domains. Cevik and Alkan (2012) assessed the research on the use of technology in education; the use of technology by teachers; and their ability to integrate this technology into the lessons. They discovered in these studies that educators' attitudes toward the use of technology in education are positive; however, many educational institutions were unable to fully integrate the use of technology into their teacher training programs, and the majority of educators lack sufficient experience in the use of technology. Bauer et al (2003) all disclose and defend similar findings. According to Çevik & Alkan (2012), the use of computer technologies in music education in Turkey is not at the intended level, and that the applications are more confined with learning notation software and getting general culture on the computer technologies used in music education.

Furthermore, in the conclusion of their study, it stated that candidates believed that by incorporating technology in the music class, the lessons would be more joyful; learning would be more permanent, and this method of education would increase the student's motivation for learning or conducting research on the topic. Candidates who took part in the study also mentioned the following deficiencies affecting the integration of technology into the lessons: the instructors' lack of knowledge on the use of technology, the inappropriateness of the physical conditions of the classroom environments, the inadequacy of the number of computers for each student, the lack of software, computer programs, and technical deficiencies. Participants also propose that they should study in this topic during their undergraduate education, and that relevant software and physical surroundings should be improved in order to establish adequate classroom conditions.

It was undeniable that, in order to accomplish technical progress, competence in music education must be obtained. And, in order to do this, all of the issues that arise in secondary school music education teaching and learning that contribute to students' poor performance must be addressed as a priority. One method of doing this was via the use of information and communication technologies. Music education was a valuable tool in every culture, and it was much more so in today's technologically advanced world. The development of science-based knowledge, such as technology and industry, and even the formation of good analytical thinking in everyday life in a contemporary culture such as ours, according to him, was a fundamental component of music education.

Music education teachers play a critical role in the execution of the curriculum; it was their duty to guarantee that science students achieve the national objectives. In addition, each learner has a unique set of traits that may indicate a need for specialized learning assistance. In order to be successful in the real world, learners need the contents and methods of teaching to be readily transferrable. As a result, the teacher's responsibilities include, among other things, providing resources and situations that will

assist learning and fulfill the expectations of the learners. Furthermore, technology facilitates music education in terms of data use, storage, sharing, and transit of visual and non-visual textual material, graphs, audios, and other materials. Technology was also beneficial in terms of cost. Furthermore, technology provides a familiar, diverse, cost-effective, and practical learning environment in music education. Students' academic performance was increased as a result of using technology in the classroom, which was another contribution technology provides to music education. When compared to conventional teaching, the use of technology enhances the academic performance of students in the classroom (Tejada & Morel, 2019).

Generally speaking, a medium was defined as "an intervening agent, method, or instrument via which anything was communicated or done." When speaking about media, the plural form was media, which, in the context of music education, refers to the tools that were used to produce, store, and display instructional material. These include tools such as chalk and talk, books and computers, slide projectors, video projection, overhead projectors, document cameras, audio systems (such as a CD player or radio), combined sound and video systems (such as television, digital video cameras, and DVDs), and the media objects themselves (such as television, digital video cameras, and DVDs). The word "technology" was first used in the 1960s to represent the combined use of multiple media, such as text, film, video, still pictures, and audio, in a single presentation. Technology was defined as the integration of various technological resources for delivering information expressed in many forms via a variety of different sensory modalities.

In the field of music education, technology was referred as effective. In music education, technology facilitates and expands learning opportunities. Students may get access to completely new knowledge as a result of technology activities. Using technology techniques, it claims that students may acquire knowledge and information that would be difficult to get via conventional means; in addition, they will have the chance to create their own products. Therefore, it was possible to claim that the usage of technology has the goal of assisting students with a variety of talents and learning styles. In addition, it points out that technology provide the chance for each student to work on their own project independently. A student may work on the subject(s) she/he thinks she/he needs to work on in the manner that she/he wants, or on any subject(s) she/he desires. It was critical that students get acquainted with the main signs and symptoms of frequent clinical diseases while depicting clinical disorders. Movement problems were easier to see than they were to explain. In terms of demonstrating clinical skills, the proper method for fundamental clinical skills may be given on video before students try these procedures for themselves, assisting in the retention of the abilities prior to executing (Cano & Sanchez-Iborra, 2015).

On the basis of research into this topic, it was possible to conclude that the use of technology in music education lessons was beneficial. In light of these findings, it seems that it was feasible to make greater use of technology possibilities to access information and guide students to information by incorporating them into technological implementations. Technology was one of the ways in which technology possibilities were combined with music educational objectives. Furthermore, it can be

noted that technology increases the authenticity and diversity of learning and teaching in a number of settings. Martinková (2019) emphasizes the notion that the message delivered via technology reaches the recipients in a variety of ways, resulting in a more diverse learning environment for the students. The topics being taught might be communicated to pupils via web-based audio, images, video, and animations in a manner that could not be taught authentically in classrooms using conventional methods. This would allow for a greater degree of connection to reality and a more comprehensive learning experience.

According to proven research, educational technology, particularly the efficient use of technology during education, as well as the integration of technology into music courses, is essential for educational success. The researchers also found that educational institutions must include instructional/tutorial software into their music curricula to be effective. Candidates who participated in the study also identified the following deficiencies that hindered the integration of technology into the lessons: instructors' lack of knowledge about the use of technology, inappropriate physical conditions in the classroom environments, an inadequacy in the number of computers available for each student, a lack of software, a lack of computer programs, and technical deficiencies.

Furthermore, technology facilitates music education in terms of data use, storage, sharing, and transit of visual and non-visual textual material, graphs, audios, and other materials. Technology was also beneficial in terms of cost. Furthermore, technology provides a familiar, diverse, cost-effective, and practical learning environment in music education. Students' academic performance was increased as a result of using technology in the classroom, which was another contribution technology provides to music education. When compared to conventional teaching, the use of technology enhances the academic performance of students in the classroom. Music education benefits from the use of technology when it was properly planned and implemented as compared to conventional teaching in terms of student academic performance (Zhang, 2021).

In the teaching/learning process, animation teaching was a device that combines the features of both audio and visual presentations. It involves the delivery of a program or instruction that has been recorded on a videotape or disc, and it was used to effectively disseminate knowledge throughout the process. Using this technique, learners may improve their retentive memory and recall abilities by engaging both their visual and auditory senses at the same time. Information from a figurative point of view (i.e. utilizing visual representation rather than a symbolic explanation of facts) may be used in animation teaching to develop internal representations of phenomena, as shown by the following studies: When it comes to animation, it may be defined as the fast succession of images that represent a sequence of slides, the emergence and disappearance of iconic elements on a continuous basis.

Following the findings of this research, it was possible to claim that the use of technology facilitates and objectifies learning since it exposes more than one technical element to the learner and addresses more than one emotion of the receiver. The introduction of these cutting-edge technologies into our music educational system will enhance the teaching and learning of music in our classrooms. The

following areas, according to him, were important: music education as a life skill, music education as a path to economic success, music education as a source of beauty, and music education as a source of knowledge. According to Onuora-Oguno and Umeojiaka, in recent years there has been an increase in (2020) It appears that there has been a sudden increase in the demand for information and communications technology (ICT) for teaching and learning music education in secondary schools around the world, including computers, the internet, overhead projectors, slide projectors, A-V materials, hand held calculators, printed materials, films, motion pictures, sound and video recorders, and improvised materials, among other things. Three new models of music education were emerging in response to the new possibilities made possible by the integration of information and communication technologies (ICT), particularly Web-based technologies, into the teaching and learning environment. The successful integration of such applications, on the other hand, was highly dependent on the familiarity and competence of the instructor with the information technology learning environment. Many nations today consider mastery of the fundamental skills and ideas of information and communications technology (ICT) to be an unavoidable element of the core of music education.

In the field of music education, technology was referred as as effective. In music education, technology facilitates and expands learning opportunities. Students may get access to completely new knowledge as a result of technology activities. It claims that students may acquire knowledge and information that would be difficult to get via conventional means; in addition, they will have the chance to create their own goods using technology techniques. Therefore, it was possible to claim that the usage of technology has the goal of assisting students with a variety of talents and learning styles. Furthermore, they point out that technology provides the possibility for each student to work on their own project independently. In other words, a student has the freedom to work on the subject(s) she/he thinks she/he needs to work on in the manner that she/he prefers to work.

Music education instructors must understand how information and communications technology (ICT) was utilized as a teaching and learning tool, both for their own reasons and to assist students in using it. Using ICT in the music education classroom, this module aims to improve student learning and teacher effectiveness by enhancing the efficacy of teaching and learning. To the best of Hernández-Bravo et al. (2016)'s knowledge, there was currently no country-wide curriculum or official guide for teachers to guarantee that the fundamental requirements were fulfilled, and what guidelines do exist were written in formal language that was inaccessible to the ordinary teacher. Teaching was focused on calculation, rather than on understanding the ideas hidden beneath the figures. Students do not remember information until they have a more in-depth grasp of the subject of music education. The Philippines government was relying on technology to address these problems, using advances in information and communications technology (ICT) and music education.

#### **RESEARCH OBJECTIVES**

This study is intended to evaluate the integration of ICT using music software in music education. Specifically, it seeks to answer the following questions.

- i. What are the software used to be beneficial at music education?
- ii. What are the usages of the software in music education?
- iii. What is the impact of using ICT software in music education?

## **THEORETICAL FRAMEWORK**

This study, which was founded on the theory of Bandura (1997) "Self-efficacy refers to a belief in one's capacities to organize and execute the courses of action required to generate specific attainments," according to Bandura (1997). "A teacher's efficacy belief is a judgment about his or her capacities to bring about desired results of student engagement and learning, even among pupils who may be challenging or uninspired," according to the teaching profession. In other terms, teacher self-efficacy refers to "teachers' beliefs that they are competent of carrying out effective classroom instruction."

Previous research has shown that teachers' self-efficacy affects their job satisfaction and professional commitment attrition from the teaching profession (Klassen and Chiu, 2011; Hong, 2012), and is a significant predictor of students' motivation and achievement (Guo et al., 2012). Identifying characteristics that influence teachers' self-efficacy in using ICT in their teaching practice is thus an essential topic to research. According to social cognition theory, individuals' perceptions of their own competence and skills in a certain area of interest may have a beneficial effect on continued growth and a sense of mastery in that same field and similar fields of interest. According to Bandura (1997), these beliefs are stronger than one's real talents, and so self-efficacy beliefs can become self-fulfilling prophecies. According to Bandura, self-efficacy in a certain area influences individuals' mental processes, levels of persistence, levels of motivation, and affective states regarding tasks within the same area, hence impacting individuals' performance. Increasing people's self-efficacy beliefs in a given set of tasks improves their performance on those tasks; but, those same people may fail in tasks that surpass their estimated coping capacities (Bandura, 1997). Recent research on self-efficacy and the use of ICT in education supports Bandura's assumptions and emphasizes the idea that improved levels of computer self-efficacy can lead to increased levels of confidence in becoming an efficient teacher using ICT (Fanni et al., 2013). Hammond et al. (2011) investigated the causes behind teachers' use of ICT and established a link between lower levels of ICT self-efficacy and less frequent use of ICT. Furthermore, current study shows a beneficial association between self-efficacy in using digital tools and the usage of ICT for educational reasons (Hatlevik, 2017). Furthermore, there is a link between student teachers' computer use and their computer self-efficacy.

Self-efficacy, according to Bandura (1997), is domain and situation specific (i.e., it is not a global trait). We focus on teachers' ICT self-efficacy for instructional purposes in this study, which reflects instructors' self-confidence in using ICT in their own teaching and instructing. Krumsvik (2011) distinguishes between confidence in using ICT on your own and confidence in utilizing ICT for

educational goals. Scherer and Siddiq (2015), who used the same data as we do in our study, found that computer self-efficacy in basic and advanced ICT operational and collaboration abilities, as well as self-efficacy in utilizing computers for instructional purposes, are significantly connected but distinct variables. One interpretation of this positive relationship is that instructors' broad view of their own ICT skills (general ICT self-efficacy) is a required but not sufficient determinant of self-efficacy in using ICT for instructional purposes. This view makes sense, because you must be competent in a skill yourself in order to incorporate it when training others. According to Bandura's (1997) theory of self-efficacy and the findings of the different studies discussed here, teachers' ICT self-efficacy for instructional reasons is positively related to their overall ICT self-efficacy.

On the basis of research into this topic, it was possible to conclude that the use of technology in music education lessons was beneficial. In light of these findings, it seems that it was feasible to make greater use of technology possibilities to access information and guide students to information by incorporating them into technological implementations. Technology was one of the ways in which technology possibilities were combined with music educational objectives. Furthermore, it can be noted that technology increases the authenticity and diversity of learning and teaching in a number of settings. They convey the fact that the content delivered via technology reaches the intended audience in a variety of ways, resulting in a more engaging learning environment. The topics being taught might be communicated to pupils via web-based audio, images, video, and animations in a manner that could not be taught authentically in classrooms using conventional methods. This would allow for a greater degree of connection to reality and a more comprehensive learning experience.

Furthermore, technology facilitates music education in terms of data use, storage, sharing, and transit of visual and non-visual textual material, graphs, audios, and other materials. Technology was also beneficial in terms of cost. Furthermore, technology provides a familiar, diverse, cost-effective, and practical learning environment in music education. Students' academic performance was increased as a result of using technology in the classroom, which was another contribution technology provides to music education. When compared to conventional teaching, the use of technology enhances the academic performance of students in the classroom. When correctly planned, the use of technology in music education may have a beneficial impact on academic performance when compared to conventional teaching, according to research.

In the teaching/learning process, animation teaching was a device that combines the features of both audio and visual presentations. It involves the delivery of a program or instruction that has been recorded on a videotape or disc, and it was used to effectively disseminate knowledge throughout the process. Using this technique, learners may improve their retentive memory and recall abilities by engaging both their visual and auditory senses at the same time. Information from a figurative point of view (i.e. utilizing visual representation rather than a symbolic explanation of facts) may be used in animation teaching to develop internal representations of phenomena, as shown by the following studies: When it comes to animation, it may be defined as the fast succession of images that represent a sequence of slides, the emergence and disappearance of iconic elements on a continuous basis. It

appears that there has been a sudden increase in the demand for information and communications technology (ICT) for teaching and learning music education in secondary schools around the world, including computers, the internet, overhead projectors, slide projectors, A-V materials, hand held calculators, printed materials, films, motion pictures, sound and video recorders, and improvised materials, among other things.

The lack of documentation regarding ICT use was a problem that exists in many countries. In developing countries in particular, data that could help determine how scarce music educational resources should be distributed or how effectively they were being used were simply not available. Music educational researchers in these countries tend to collect data on inputs such as teachers, students, classrooms, and expenditures. Researchers tend to ignore substantive issues regarding IT implementation and its effect on people and work processes. Without adequate documentation, decision makers tend to base music educational policy on imprecise data or purely political considerations, rather than rigorous, empirical analysis and evaluation of music educational outcomes.

## **RESEARCH DESIGN**

The qualitative research method was used in this study particularly through written documents. They also want to learn about the intricacies of our social environment. They were inductive and have commonalities in that they investigate 'what,' 'why,' and 'how' questions, as opposed to 'how much' and 'how many' inquiries favored by quantitative research. Researchers want to examine objects in their natural environments and to add up or interpret the meanings that individuals give to their experiences in daily language. The qualitative inquiry distinguishes itself by its experiential knowledge of the intricate interrelationships between phenomena and its direct interpretation of occurrences. As a result, the emphasis was on attempting to uncover patterns of unexpected and predicted connections in instances or events. Researchers do this by using their subjective judgment while demonstrating how their assumptions influence the information generated via personal reflexivity during a kind of self-analysis and self-evaluation throughout the study.

## **Data Collection Method**

Secondary data will be gathered in academic papers that will be available for internet and conventional study via the library. However, previous records, compliance reports from the past, articles, journals, and internet resources will be used to understand and evaluate the existing instructional module to ensure it aids in the intended research area and to gain knowledge in the theory, recent and past studies on how to make an effective and comprehensive activity in students. To get in-depth study resources,



the researcher will visit the journal's website on interactive instructional technology apps for music teachers.

As the study project progresses, the secondary sources will be changed and updated. In this regard, the researcher intends to utilize the following secondary sources: Publications from the World Economic Forum, include news stories, online articles, school reviews and research papers, case studies, and books.

### **Code of Ethics**

- i. The researcher accepts full responsibility for the publishing of this research effort. To prevent plagiarism and copyright infringement, proper referencing and acknowledgement of public and unpublished sources was used.
- ii. Any sensitive data or information acquired during the study must be treated with strict secrecy. All data gathered will be used only for the purpose of completing the study project.
- iii. The researcher must maintain objectivity by putting aside any personal prejudices and relying on objective analysis and conclusions based on facts verified by numerous sources.
- iv. The researcher must take all necessary measures to guarantee the above-mentioned principles were implemented and followed.

### **DATA ANALYSIS**

The phrase "tutorial music software" refers to programs that include more theoretical content and offer subject-related terminology in the form of explanations, definitions, and questions without establishing an interactive connection between the computer and the student. Examples of such apps include Making Music, Music Ace, Smart Music, Music Goals, Julliard Music Adventure, Their Lives and Music, Art and Music, and Piano Suite Premier. Additionally, dynamically designed online educational programs offer visual and auditory information about musical genres, musical styles, musical history, famous composers, country music, and musical instruments. These apps are compatible with CD-DVD players, but they may also be launched directly from the Internet or installed on a computer.

Students may practice while simultaneously assessing and evaluating their basic knowledge of music history and theory using drill and practice software. Additionally, students contribute to the development of musical listening, reading, writing, musical form, and harmonic analysis. Because it allows for proper levels and quantities of practice and repetition, this program may result in more enduring learning. While the student may answer questions using the computer keyboard, he can also utilize a microphone to get feedback. 3.3 Music Lesson 1-2, Ear Master, Note Card Mibac Music Instruction, among the apps listed by Nart (2010), and Levendolu are Aurailia, Essentials of Music Theory, Practica Musica, and Music Goals.

Among these programs is instrument teaching software that facilitates interactive music education. Professor of Piano, Guitar Method, Violin Tutor, Recorder Tutor, and Singing Tutor, among others. This category includes applications such as Bandin-a-Box, Cakewalk, Smart Music, Interactive Songbook, and Vivace that allow users to accompany the software's music (prepared background music).

The MIDI [Musical Instruments Digital Interface] technology is one of the most important areas that have been elevated to prominence as a result of the widespread use of computers in music education. MIDI is a numeric data transfer method that is used solely to send and exchange data between electronic instruments (electro-piano, electro-drum, and electronic wind instruments), computer software, and other MIDI-compliant devices. MIDI, by definition, "transmits just data, not sound." When you press the key "do" on the keyboard, the MIDI protocol sends numerous data to the computer software used to record it, such as the octave in which this "do" note is located, the strength with which it sounds, and its musical duration. While some electronic instruments with MIDI connections contain sound databases, others do not and are designed only to use the sounds generated by computer software.

Most of this software, which aims to teach music through games, has a score system (for evaluation), similar to that found in interactive computer games. Examples of this type of interactive software include Music Ace, Adventure in Music Land, Ear Challenger, Pattern Block Rock, Classics for Kids, Game Room by NY Philharmonic, Music Lab/Musical Skies/InstrumentGarden/Symphony Hall and Music Mountain by SFS Kids.com, and Maestro: Virtual Orchestra Game. There are also several games that can be accessed via the Internet.

**Notation Software** Examples of notation software include Sibelius, Finale, Encore, Autoscore, Overture, Rhapsody, Music Time, and Magic Score School. In Turkey, the most common are "Finale" and "Sibelius." Notation programs are pieces of computer software that allow all musical parts to be created, modified, arranged, recorded, and reproduced in accordance with the rules. Notation created using this software can be listened to using the computer's sound cards, allowing the user to make changes and/or alterations to the work. As a result of the experimental working environment it provides, it also contributes to the development of the user's creativity. The computer's sound card is adequate for vocalizing most software-sampled instruments, but it is insufficient for vocalizing country-specific folklore instruments. While the software does not include the sound values of modal music works (sounds with commas), the musical elements used in modal music can be added as figures and typefaces to some of these programs.

Computers are the most efficient tools among ICT that provide access to and use of music software. Aside from music education software, there are other websites that provide information and resources (<http://www.musictheory.net/>; <http://trainer.thetamusic.com/>; <http://www.teoria.com/>). These websites also provide important materials for music instruction that may be shared through computer technology. Another ICT device that is now commonly utilized in education in Turkey and around the world is the "smart board," which is used in the technology-supported classroom known as the "smart

classroom." Mimio Vote is a well-known brand in the field of smart board technology ([www.mimio.com](http://www.mimio.com)). Any white board can be converted into a smart board using infrared technology, a computer, a projector, and a product like Mimio, which includes a control bar, music lesson software, and an interactive pen. A smart board displays text, audio, and virtual images all at the same time. This facilitates both the music teacher's use and the concretization of abstract concepts. As a result, it enables for more active and fascinating lessons to be processed, as well as more efficient and effective use of the course period.

## **USAGES OF THE SOFTWARE IN MUSIC EDUCATION**

Almost any music instructor can write, draw simple pictures, record and copy them on a computer, or use his computer to watch and listen to visual or audio media items. However, computers provide music teachers two more technological options in addition to listening to music from CDs, playing mp3 tracks, watching films, and presenting visual materials with projectors: the capacity to create notes and record sounds... There are numerous software alternatives for notation and recording available nowadays. However, it is not practical for a teacher to understand and operate all of the software that requires specialized knowledge on their own. However, the ability of each music instructor to use some programs that are widely accepted around the world at a certain level is also a requirement of the modern educational approach.

The use of information and communication technologies (ICTs) for children with learning needs was a topic that was now being researched extensively by the scientific community. Similarly, music has gained attention over the years in the area of learning impairments, and has recently emerged as a critical component in improving the quality of life for individuals with special needs. However, there was still a gap in the integration of information and communication technology (ICT) and music education tools. While teaching History in schools over the last 20 years, information and communication technology with technology (text, pictures, and audio) have often been utilized to assist teaching and learning. In South Africa, music classes have become more dynamic and learner-centered as a result of the integration of information and communication technology (ICT) and the use of technology materials in teaching and learning. In reality, historians who study history music education advocate for the use of a broad range of technology resource materials in the classroom (text, images and audio). In the field of music education, the visualization capabilities of video were considered to be both quick and strong in the display of information (Mishra & Koehler, 2006).

Multimodal information, such as visuals and animations, photographs, as well as sound and voice, was suggested in music education courses to ensure that students get a thorough comprehension. Examples of this include the fabrication of replicas of war equipment and the illustration of geographical places in the context of a war illustration. Reality and imagery were both very important elements in such movies. Maps, animations, and films were all used extensively in music instruction as well. When animations were coupled with user input, students may see various versions of change throughout time, based on the factors that were being used to create them. Graphics offer opportunities for students to

be creative while engaging in a learning experience. The reasons why technology was encouraged in music education were because it was easily accessible for usage, it aids in the retention of knowledge, and more material can be given more quickly and in an engaging manner (Greece, 2003).

It enables the demonstration of complex processes in a highly interactive, animated manner, and that instructional material can be interconnected with other related topics in a more natural and intuitive manner. It encourages university lecturers to use technology (text, pictures, animation, sound, video, and interactivity), as well as new devices and their applications, to ensure that pre-existing knowledge was retained. Because technology includes a strong intuitive component, it has the potential to successfully grab students' attention, resulting in great music educational results. Some teachers, on the other hand, utilize technology excessively in the classroom, resulting in students being fully immersed in technology films and animations throughout the teaching process (Lisette, 2008).

The use of technology in music theory instruction has grown more and more common as the new curriculum reform has progressed further in its development. In light of the current state of the application of technology in music education, this study examines the role of technology in improving the efficiency of music theory classroom instruction, and then discusses the benefits and value of technology in music theory classroom instruction. Last but not least, this paper brings together the foregoing contents and makes judgments on teaching strategies and the application of technology, but it also expresses hope that technology can be better applied to create favorable conditions for music theory teaching in the future. The term "technology teaching" refers to the method of instruction that utilizes a technology platform and equipment (McDowall, 2003).

A growing number of music classrooms were incorporating technology technologies into their lessons as a result of the fast growth of information technology, as well as the continual improvement in economic development in our nation. When looked at objectively, technology not only has a more appealing appearance, but it may also produce atmospheric effects that increase students' interest in learning and help them retain their learning passion throughout their academic careers as well. It was the purpose of this article to present the role of technology in improving the effectiveness of music theory courses in order to further examine the function of technology in the teaching of music theory courses.

#### **IMPACT OF USING ICT SOFTWARE IN MUSIC EDUCATION**

Panagiotakou and Pange (2010) highlighted how advances the ICT have affected many sectors of society, including music education. The use of ICTs in the form of e-learning was already altering teaching and learning processes in higher music education. According to the research, technology integration was the use of technology in general subject areas in music education to enable students to use computer and technology skills to learn music. In general, technology was driven by the curriculum rather than the other way around. The use of technology to improve and assist the music educational environment was referred to as technology integration. Technology integration in the classroom may

also help to enhance classroom teaching by allowing students to complete tasks on the computer rather than with pencil and paper. Students would be able to explore more if technology was used in the classroom.

According to Aróstegui (2010)'s study report, technology integration with conventional music education curriculum may offer instruments for advanced learning across a wide variety of subjects. Because of the present environment of accountability, outcome-based music education, and uniformity in assessment, the integration of information and communication technologies was often carefully watched and assessed. In certain cases, integrating technology may be difficult. It has been shown that a high student-to-technological-device ratio impedes or slows learning and task completion. In certain cases, dyadic peer contact based on integrated technology has been shown to foster a more cooperative sense of social connections. In terms of software accessibility to students and instructors, the availability of suitable software for the technology being integrated was also an issue.

According to Bauer and Mito (2017), technology in the classroom contributes to global growth and diversity by helping students acquire the basic building blocks required to accomplish more sophisticated concepts. To have an effect on the music educational system, instructors and students must have access to technology in a setting that was culturally relevant, responsive, and meaningful to their music educational practice, as well as one that fosters excellent teaching and active student learning. Following the realization by instructors that their pupils were competent, autonomous technology users capable of creating inspirational digital masterpieces.

A new mentality of technology-enhanced music education must develop, which was dependent on a critical change in teacher/student roles. This benefits both the learner and the instructor. The four Cs were at the core of the International Society for Technological in Music education's National Music educational Technology Standards (NETS) for Students, which provide a significant framework for determining the emphasis of K-12 students' technology goals. Furthermore, it can be noted that technology increases the authenticity and diversity of learning and teaching in a number of settings. Martinková (2019) emphasizes the notion that the message delivered via technology reaches the recipients in a variety of ways, resulting in a more diverse learning environment for the students. The topics being taught might be communicated to pupils via web-based audio, images, video, and animations in a manner that could not be taught authentically in classrooms using conventional methods. This would allow for a greater degree of connection to reality and a more comprehensive learning experience.

E-learning was the use of information and communication technologies (ICTs) to improve and assist teaching and learning processes. It refers to the instructional material or learning experiences that were provided or facilitated by electronic technology, and it includes a broad range of learning methods and tools. E-learning encompasses anything from how students utilize e-mail and access course material online while taking a course on campus to programs that were completely online. Teaching methods based on music educational technology may be defined as ethical practices that aid students' learning

while also increasing their capacity, productivity, and performance. Because technology includes a strong intuitive component, it has the potential to successfully grab students' attention, resulting in great music educational results. Some teachers, on the other hand, utilize technology excessively in the classroom, resulting in students being fully immersed in technology films and animations throughout the teaching process.

When teachers return to the classroom, they find that their students have forgotten everything, reducing the effectiveness of theoretical teaching. Furthermore, some instructors often make the error of trying to teach certain basic teaching connections using technology complexity, which does not enhance teaching efficiency. It has also had an effect on the total amount of time spent in the classroom, which limits students' capacity to envision and improve their learning, which was counter to the original purpose of teaching. Teachers should not only continue to develop their teaching skills and training teaching experience in response to the aforementioned problems, but they should also pay attention to the timing of the use of technology technologies. In order to guarantee the efficiency of teaching and the basic features of the knowledge, it was also important to retain students' desire to study. Otherwise, there will be an overwhelming situation in which teachers will be unable to emphasize the importance of teaching and will be unable to effectively use technology, which will have a negative impact on the effectiveness of teaching and cause students to lose valuable classroom time (Chen, 2012).

Some instructors choose to utilize more set courseware for teaching, which has the benefit of maintaining the teaching mode reasonably constant and free of difficulties, but it also limits the teacher's own play, as teachers must conduct their own lessons in line with the courseware of others teaching. Students' expectations for the quality of courseware were rising in lockstep with the advancement of technology. Knowing how to produce distinct courseware and courseware by increasing the uniqueness of the material should be part of a teacher's teaching abilities. Teachers should also be able to improve the relevance of courseware by knowing how to develop different types of courseware. Various courses and students show varied degrees of understanding and command of music theory over the course of training. Teachers who develop their own courseware have a better knowledge of classroom instruction evolution and were better equipped to adjust their instruction to their students' learning stages, attaining the value and purpose of technology in theoretical teaching.

## **SUMMARY AND CONCLUSION**

The purpose of this study is to show the data gathered through the screening process regarding the software used and judged advantageous in music education, as well as the use of the program in music education. There is a plethora of software available now for music educators to use. It is believed that this software should be utilized in music education to promote learning and enrich the learning environment during the learning process; that is, these should have the feature of being a learning/teaching tool for the teacher and the student rather than a purpose. This program can let the learner engage in a learning process that involves active engagement in both acquiring and disseminating musical knowledge as well as making music.

Furthermore, because not every student learns in the same way or at the same rate, the individual will be presented with diverse learning opportunities and will be able to experience these in a music education structured by utilizing this program. The essential point to remember during this process is that the teacher should have a thorough understanding of the software he will be using and understand how he will profit from it in the classroom. While the teacher's qualification in this subject will positively influence education for both the student and the teacher, it will also allow for the prevention and/or resolution of potential negatives. Because there are no software, sources, or instructional materials to be used in music education, it is essential to publish practice-oriented information comprising sources in the literature. Aside from that, it is vital to specify in detail which education level music software will be utilized, as well as which application will be used to run the classes. In this perspective, it is required to restructure the courses on computer usage in undergraduate music teacher programs, which currently provide solely theoretical knowledge in terms of content. Furthermore, the relevant course programs must be enhanced in order to include the technology employed or capable of being used in music education.

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