

## Music Software in the Technology Integrated Music Education

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### ABSTRACT

The role of the teacher has changed as the traditional education methods, techniques and applications have left its place to the student-centered methods, techniques and applications along with the 21st century. Teachers are no more *source and share the information* but they do *guide* students to access information and *manage the process*.

Today, it has become an inevitable requirement that a teacher who guide his student should follow technological developments in his field; master and use the technology in the classroom and integrate it to his lessons. Prensky (2001) who calls today's students as *Net Jeneration* states that these students are all "native speakers" of the language of "digital" by spending hours per day with computers, internet, video games, IPHones, IPads and television and brands them as *Digital Natives*.

This study aims to find out the software used and deemed to be beneficial at music education and the usage of the software in music education. For this purpose the publications, researches and internet sources of current literature were examined by screening method and the data obtained brought together and interpreted. As a result, it was determined that, there is a lot of software able to be used in music education and they provide an effective and efficient education process for both the teachers and learners. Based on these results what needs to be done on this issue was discussed and suggestions were made.

**Keywords:** Music education, educational technology, music software.

### INTRODUCTION

Contemporary education programs generated according to the educational needs that are student-centered; multiple sense organs involving; creativity and productivity targeted are developed for teachers and learners who are following the technological developments and open to develop. In this context the use of technology and technological materials increasingly come to the forefront in today's contemporary educational approach. Günay and Özdemir (2012, p. 33) expressed that the idea of educational technology might be developed by questions like "How can I learn?", "How can I teach easily?", "How can I teach persistent knowledge and skills?" within the learning-teaching environments. In its report TUBITAK (2005) [Scientific and Technological Research Council of Turkey] attracts the attention on the importance of the introduction of information and communication technology (ICT) materials into the schools as a tool and their utilization as an efficient material within the teaching process. TUBITAK lists the main targets and strategies towards the technology based education to be achieved in 2023 as follows (2005, p. 80):

1. The country wide spread of the necessary technological infrastructure for virtual learning should be completed.
2. It should be provided that country specific education models in the developed technological infrastructure environments are added to the system.
3. It should be targeted to become a global leading country in terms of definite products in the field of software technologies.
4. The growth of the brain power to prepare the contents required by the learning models in the virtual environment should be strengthened.
5. It should be provided that all educational institutions are connected to the network and that the educational institutions benefit from the whole technological infrastructure, including the national satellite system, at maximal level.
6. It should be provided that the numeric gap is closed and attention should be paid on the equipment differences at the educational institutions. Priority should be given to areas below the European standards.

7. The conversion of all teachers and instructors such to have the knowledge, skills and equipment in order to develop the materials they need should be completed. It should be provided that educational items able to be shared on the Internet are developed, spread and applied by the teachers.

There is no doubt that in order to achieve these targets determined by TUBITAK, primarily the teachers need to be educated as individuals who fulfil the technological requirements; who at least are good computer users and informed about the technological developments in their fields. Çevik and Alkan (2012, p.135, 138) had evaluated the researches (Niederhauser & Stoddart, 2001; Brush & Saye, 2002; Lynch, 2006; Yenilmez & Sarier, 2007; Perkmen & Çevik, 2010) performed regarding the utilization of technology in education; the utilization of technology by the teachers and their ability to integrate this technology into the lessons. They determined in these studies that the educators approach towards the utilization of technology within the education is positive; but that many education institutions were not able to fully integrate the utilization of technology into their teacher training programs and that the most of the educators don't have the sufficient experience in terms of the utilization of the technology. Similar results are revealed and argued by Kolburan and Göktaş (2014), Yalçın and Eldemir (2013), Sevinç and Koldemir (2009) and Önlü (2007). Önlü (2007) states that the use of computer technologies in music education is not at the desired level in Turkey and that the applications are more limited with learning notation software and obtaining general culture on the computer technologies used in music education (p.41). A research was conducted by Bauer and McAllister (2003) to determine if 1-week technology workshops can be an effective means for the professional development of music teachers in using technology for instruction. The results indicate that three indicators of effectiveness—teacher knowledge, teacher comfort, and frequency of teacher use—can be significantly improved in these settings. The analysis results obtained from the comprehensive research conducted by Tuti (2005) revealed that only 69 of 1014 students used information technologies in the music lessons. And in the studies conducted by Norton and Sprague (1996) and Cuckle et al. (2000) as quoted by Çevik and Alkan (2012, p.139) it is determined that the efficient utilization of technology during the education and the integration of technology into the music lessons is of great importance for the education. The researchers also revealed that it is necessary to use educational/tutorial software in the curriculum of the faculties of education. In addition to that Çevik and Alkan (2012) stated in the conclusion of their study that candidates thought that by integrating technology in the music class, the lessons would be more joyful; learning would be more permanent and this way of education would increase the motivation of the student for learning or to do research on the topic. Also, candidates who participated in the study listed the deficiencies affecting the integration of the technology into the lessons as; the instructors lack of knowledge on the use of technology, the inappropriateness of the physical conditions of the class environments, the insufficiency of the number of computers for every student, the lack of software, computer programs and technical deficiencies. The participants also suggest that they need to study in this field during their undergraduate education and providing related software and improving the physical environments in order to create appropriate classroom environments should be generated.

Almost every music educator is able to write, make simple drawings, record and copy these by using computers or is able to use his computer for watching and listening to visual or audio media products. But the computers provide two more technological possibilities for music teachers besides listening to music from CDs, playing mp3 tracks, watching videos, presenting visual materials with projectors: the ability to write notes and to record sounds... At present, there are many software options for notation and recording. But it is not possible for a teacher to learn and use all the software -which require a specific knowledge on their own- in detail. However the ability of each music teacher to use some programs accepted in the whole world at a definite level is also a necessity of the contemporary education approach. Based upon these, this study aimed to determine the software that is utilized or used and thought to be useful in music education. For this purpose, the accessible scientific reports, publications and Internet resources related to the subject are examined and a descriptive study was carried out based on the screening model. The data gathered together presented and suggestions were made.

## **MUSIC SOFTWARE**

Today it is possible to mention plenty of software towards music education. Information on computer based music education and music software simply classified and listed along with their access addresses by Peter Webster and David Williams on the website 'teachmusictech.com' ([http://www.teachmusictech.com/music\\_software\\_list.html](http://www.teachmusictech.com/music_software_list.html)). In this study the related music software that is widely used in music education are outlined under five main headings below.

### **1. Tutorial Software**

Tutorial music software covers the programs which include more theoretical information and where the subject related terms are presented as explanations, definitions and questions without establishing an interactive communication between the computer and the student. *Making Music, Music Ace, Smart Music, Music Goals,*

*Julliard Music Adventure, Their Lives and Music, Art and Music, Piano Suite Premier* can be given as samples for such type of software. Beside this, interactive prepared online tutorial programs also provide visual and auditory content about music styles, music types, music history, famous composers, country music, music instruments etc. While these programs can be used with CD-DVD players, they can also be run on the Internet or be used upon installing them on a computer.

## 2. Drill and Practice Software

Drill and practice software allow the student to practice and the students are both able to measure and evaluate student's basic knowledge on music history and music theory. Students also perform works regarding musical listening, reading, writing and musical form or harmonic analysis. This software is able to provide a more persistent learning since it allows a drill and practice at desired level and desired amount. While the student can answer the questions by using the computer keyboard, he can also get a feedback by using a microphone. Some of the software stated by Nart (2010), Önlü (2007) and Levendoğlu (2004) are *Ear Master, Note Card 3.3 Music Lesson 1-2, Mibac Music Lessons, Aurailia, Essential of Music Theory, Practica Musica and Music Goals*. There is also some software designed for instrument training among this software which offer an interactive music education. For example *Piano Professor, Guitar Method, The Violin Tutor, Recorder Teacher, Singing Tutor*. Programs like *Bandin-a-Box, Cakewalk, Smart Music, Interactive Songbook and Vivace* which allow the users to accompany the music provided by the software (arranged background music), can be mentioned under this heading.

## 3. Game Software

In most of this software that is aiming to teach music by games, there is a scoring system (for evaluation) as in the interactive computer games. *Music Ace, Adventure in Music Land, Ear Challenger, Pattern Block Rock, Classics for Kids, Game Roomby NY Philharmonic, Music Lab/Musical Skies/InstrumentGarden/Symphony Hall and Music Mountain by SFS Kids.com* and *Maestro: Virtual Orchestra Game* can be considered as examples for this type of interactive software. Also there are many games able to be accessed on the Internet presented at the web address <http://www.cornerstoneconfessions.com> under the title “*The Ultimate List of Online Music Education Games*” along with their links.

## 4. Notation Software

Software like *Sibelius, Finale, Encore, Autoscore, Overture, Rhapsody, Music Time, and Magic Score School* can be given as examples for notation software. The most commonly used ones in Turkey are “Finale” and “Sibelius”. Notation programs are computer software which allows all the musical elements related to music to be written, edited, arranged and recorded and reproduced according to the rules. Notation prepared with this software can be listened by the sound-cards on the computer and allow the user to make corrections and/or modifications on the work, too. Such that it also contributes to the development of the creativity of the user by this experimental working environment it provides. The sound-card on the computer is sufficient for the vocalization of different instruments sampled with software, but it remains insufficient at the vocalization of country specific folkloric instruments. While sound values of modal music works (sounds with commas) are not included in the software, the musical elements used in modal music are able to be added as figures and fonts to some of these programs.

## 5. Sequencing and Recording Software

One of the most important headings which come to the forefront by the utilization of computers in music education is the MIDI [Musical Instruments Digital Interface] technology. MIDI can be defined as a numeric data transfer protocol which only transfers and allows the sharing of data between electronic instruments (electro-piano, electro-drum, and electronic wind instruments), computer software and the entire MIDI standard supporting devices. Also stated in the definition, MIDI “transmits only data, no sound”. For example, when you press on the key “do” on the keyboard, the MIDI protocol sends multiple data like; at which octave this “do” note is, at which strength it sounds or its musical duration to the software used on the computer in order to record this. While there are sound databases on some electronic instruments with MIDI connection, there are also electronic instruments without a sound database on them and only designed in order to use the sounds of the computer software.

After the subscription of the MIDI protocol in 1982–1983, software in accordance with this protocol are developed. “*Cakewalk*”, “*Cubase*”, “*Logic Audio*”, “*Pro Tools*” and “*Nuendo*” are some of these software. The most spread used sound recording software in Turkey is “*Cubase*” (Günay & Özdemir, 2012, p.208). All processes performed with this program are realized with all electronic instruments connected to the computer and supporting the MIDI standard. While the MIDI connection was established only by using a special cable before, the usage of USB cables became widespread for the MIDI data transfer during the recent years. The data

transferred to the computer via the MIDI cable is recorded in to the sequencer section of the software for editing and organizing afterwards. Today there are very advanced audio editors included in some recording software, too. This feature allows the recording of the sounds of instruments and human voice (that are not sampling sounds). Also, this two separate data (MIDI and audio) are able to be processed together by the sequencer and audio editors within the software. This means that a violin performance can be recorded over a piano sound played with MIDI and it can be processed. Cubase, which allows the user to listen the sounds recorded with headphones or speakers, is able to visualize the recorded performance as notes (score) on the screen and allows to print these out.

As a result, there are plenty of useful software for music education and they provide opportunity both the teachers and the students to perform different works at different levels. The software, which can comfortably run on a computer with a sound-card, can now be accessed via smart phones and tablet computers under the title “applications” [mobile apps], too (Theory Lessons, Tenuto, Classicsfor Kids, Auralia, Miso Music, Percussive, Pianist etc.). Beside this smart phones and tablet computers can also be used as equipments which allow MIDI recording. Today, the usage of smart phones and tablet computers as music teaching materials has become widespread. Video images of many musical works done by using “Ipad” are shared by the students/teachers on the Internet.

The computers are leading the most efficient tools among the ICT which allow the access to and utilization of music software. Except for the music education software over the Internet, there are many websites that share information and resources (<http://www.musictheory.net/>; <http://trainer.thetamusic.com/>; <http://www.teoria.com/>). These sites also offer useful materials related to music education and can be shared through computer technology.

Another ICT technology -where the software on them are converted into visuals via computers- is now frequently used in education in Turkey and the world is the “smart board” used in the technology supported classroom called as “smart classroom”. *Mimio Vote* is one of the prominent brands with regards to the smart board technology ([www.mimio.com](http://www.mimio.com)). Any white board is able to be converted into a smart board by the infrared technology and with a computer, a projector and a product like Mimio which consists of a control bar, software for music lessons and an interactive pen. With a smart board, the text, audio and virtual images are presented at the same time. This allows both an easy usage for the music teacher and the concretization of abstract subjects. Therefore, it allows both more active and interesting lessons to be processed, as well as allow the course duration to be used more efficiently and effectively.

So far, the software used or/and able to be used in music education was tried to be mentioned in the study. But the main issue to be discussed is how the software needs to be used in music education. Unfortunately, though there are many software used in music education, resources in Turkish which explain the integration of these software into the music lessons with concrete samples are almost not available. In contrary, there are many resources related to the issue are published in English and can be found on the internet. The resources written in a foreign language might be challenging for understanding and usage, but it is thought in this study that it would be appropriate to mention about these sources, too. ‘Theory and Practice of Technology-Based Music Instruction’ by Jay Dorfman; ‘Experiencing Music Technology’ by David Brian Williams al; ‘Music Education with Digital Technology (Education and Digital Technology)’ by Pamela Burnard and John Finney; ‘Using Technology to Unlock Musical Creativity’ by Scott Watson; ‘Integrating Technology with Music Instruction: Using Standard technology teaching tools to aid student learning and teach essential music skills’ by Greg Foreman and Kylie Pace; ‘Teaching Music with Technology’ by Thomas E. Rudolph; ‘Technology Integration in the Elementary Music Classroom’ by Amy M. Burns; ‘Music Outside the Lines: Ideas for Composing in K-12 Music Classrooms’ by Maud Hickey; ‘Make Music with Your Ipad’ by Ben Harvell; ‘Musical iPad: Creating, Performing, & Learning Music on Your iPad’ by Thomas Rudolph and Vincent Leonard and a book with CD-Rom from Alfred’s Music Tech Series named ‘Teachers Manual’ which in corporates all three of the books in the series (*Composing Music with Notation*, *Playing Keyboard* and *Sequencing and Music Production*) and provides lesson ideas (suggestions that you can reference as you teach each page of the Student Books), assessment possibilities and extension activities (additional activities you can consider to extend the lesson) are some of the published sources to be mentioned in English. There are also several websites that can be mentioned as resources in this area. For instance one of these is “*Association for Technology in Music Instruction (ATMI)*” and the other is “*Technology Institute for Music Educators (TI:ME)*”. Both sites provide resources on software and technology products for music educators. ‘*The Technology Guide for Music Educators*’: a book with a wide context presented by TI:ME written by a panel of respected technology specialists and music educators in the field of music technology and edited by Scott Watson is organized into the following six core technology areas that music educators need to be competent in as they teach music in the 21st century; 1. Electronic Musical



Instruments, 2. Music Production, 3. Music Notation Software, 4. Technology-Assisted Learning, 5. Multimedia, and 6. Productivity Tools, Classroom and Lab Management. In addition to descriptions of product features, many other information valuable to educators, such as grade level appropriate ideas for integrating the technologies covered into the music curriculum are mentioned in the book, too. In the book, each chapter includes a summary table of the products presented (including system requirements and manufacturer websites) and a list of resources, such as a suggested further reading list. Other two sites which are thought to be useful are “*Kelly’s Music and Computers*” (<http://kellysmusicandcomputers.com>) and Karen Garrett’s “*Music Tech Teacher*” (<http://www.musictechteacher.com>) which provide books, worksheets and video tutorials for learning the software to ensure success in implementing technology solutions.

The goal targeted by the utilization of music software in education matches with the general goals for computer aided education listed by Demirel, Seferoğlu and Yağcı (2001, p.115):

- To increase the motivation of the student,
- To develop the scientific thinking skills of the student,
- To support group activities,
- To expand the teaching methods,
- To develop the self-learning skills of the student,
- To support the development of advanced level thinking skills of students,
- To support finding solutions for problems by the means of logic and
- To encourage students to establish hypothesis.

These targets can be considered as positive outcomes for the student, the teacher and the school at the same time. In addition to these, the emergence of the creativity; the development of the social communication skills and the willingness to share; the ability of the individual to progress at his/her pace; the increase of the attention and confidence; development of the problem solution skills; the provision of savings from the learning-teaching time; ensuring the correct and efficient utilization of the computer and the Internet; development of the documentation, filing and document referring habits; the allowance of repeating; and the increase of the success and may be most importantly, the ability to conduct easy and joyful lessons with active participation may be mentioned among the other benefits provided by software with regards to music education, too.

Instructors can benefit from that mentioned software providing many positive outcomes, in different ways at the music education. The samples below are meant to be suggestions, but may be edited and developed pursuant to the level of the student, the qualification of the instructor, the possibilities and the needs.

1. Any type of musical concept can be taught in a shorter time and concretely by the software, visuals and records.
2. Melody and rhythm exercises can be arranged and done polyphonic.
3. Vocalization or playing over a pre-prepared accompaniment with rhythm and melody instruments can be done. While these accompaniments are able to be written and prepared by the teacher, they also may be available as MIDI in Internet environment.
4. The teacher may control and conduct the class during singing with pre-recorded melodies or accompaniments. Thus both the lesson time would be used well and there would be no need for an accompanist.
5. Subjects such as polyphonic choir, symphony, harmony-counterpoint etc., which cannot be sampled or defined with a single instrument can be presented by software and allow possibilities for applications.
6. Creative activities can be carried out. (Composing for a story, composing lyrics, writing a melody for a text etc.)
7. Rhythm and melody groups can be created and entertainments can be prepared with tablet computers (by using the applications).
8. The student may find the opportunity to record his own work and performance and may able to evaluate, correct and share it.

Though all these positive aspects, it is necessary to mention some of the adverse effects related to the use of software in music education. First of all it’s necessary to emphasize that: the role of the teacher doesn’t decrease, contrary it increases in technology supported music education enriched with software when compared with the traditional education. If the teacher, who plays the role of a guide, doesn’t have the adequate knowledge it will cause unfavourable results in all respects. Therefore, it is necessary that the teacher is equipped with regards to music technologies and the related programs/software and that he/she follows and applies the developments in this field. The teacher needs to plan and program how he/she will use the software in the teaching environment in prior. Thus it will be possible to both use the time effectively and efficient and to find solutions for the

possible problems that may arise as well. Except the problems arising out of the teacher, there might also problems faced with in cases where the physical equipment is deficient or insufficient. In some cases although there are computers, the music software cannot be operated. A reason for this is that most of the software is in English and is not able to be understood. Another reason is that sales prices of the necessary software and hardware imported from abroad are high. Above mentioned negativities are revealed in the researches by Sevinç and Koldemir (2009) and Koç (2004). In addition to these, in cases where the student uses the computer as an individual learning tool without the supervision of a teacher, that study without feedback could negatively affect learning and may result in deficient and/or wrong learning. Beside this, even if ITC allows creative works, it should not be forgotten that music performed with a computer and software will be more restricted and mechanical than a live performance.

### CONCLUSION

This study aims to present the data obtained by screening method regarding the software used and deemed to be beneficial at music education and the usage of the software in music education. Today, there are plenty of software able to be used by the music educators. It is thought that this software needs to be used in music education in order to support learning and enrich the learning environment during the learning process; meaning that these need to bear the feature to be a learning/teaching tool for the teacher and the student instead of a purpose. This software can serve for that the student experiences a learning process with active participation through both gaining and spreading musical knowledge and creating music (composing – performing). Beside this, since not every student learns in the same way and same speed, the individual will be provided different learning possibilities and to experience these in a music education organized by benefiting from this software.

The main matter through this process is that the teacher should have comprehensive knowledge of the software he will use and know very well how he will benefit from this software at the education. While the qualification of the teacher in this field will positively influence the education for both the student and the teacher, it will be able to allow the prevention and/or solution of possible negativities, too. Since there are unfortunately no Turkish software, sources and/or teaching materials to be used in the Turkish music education, it is primarily necessary to publish practice oriented information containing sources in the literature. Beside this, it is necessary to determine in detail at which education level music software will be used and with which program the courses will be conducted. In this context, it is necessary to restructure the courses regarding the usage of computers in the undergraduate music teacher programs which contain only theoretical knowledge in terms of the content. In addition to that the related course programs need to be improved as to include the technologies used or able to be used in the music education.

### RECOMMENDATIONS

- The applications and developments abroad related to the subject should be examined and tracked and the existing applications in Turkey should be developed.
- The related software and programs should be reviewed by the collaboration of the music education and education technologies departments of the universities and a common terminology should be established and Turkish software and programs should be developed.
- Priorities should be given to the courses related to ICT and music technologies in the professional music education providing institutions and the training of qualified instructors should be considered.
- It should be tried to provide the necessary sources, equipments and possibilities in order to allow the teachers to include music software into their courses.
- Planned and programmed pre-service and service-internal trainings for teachers should be provided; practice oriented works should be conducted.
- It is thought that it would be beneficial to draw attention on the issue through the projects supported by the private organizations and government.
- Also, more researches and applications need to be done in the field and they should be encouraged.

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