

The uses of technology for teaching piano at the higher education level

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Abstracts

This article provides the current knowledge mainly about the use of music software in piano teaching and the software for teaching piano online or distance learning. In piano teaching or other music instruments, most teaching focuses on the interaction of learners and teachers. With musical instruments as a medium for learning, books, textbooks, and learning materials are used in inventions such as a metronome. Still, technology has become the basis for teaching and learning at the university level. Whether it's teaching content, knowledge, or teaching musical instruments, instructors themselves should develop technological skills to suit the changes that occur. This article would like to present the use of technology in teaching piano at the higher education level to be useful for further teaching and learning.

Keywords: Technology; Teaching Piano; Higher Education

Introduction

Digital concepts that emerged in higher education music courses. This shows the development of curricula in today's era with a strong emphasis on technical knowledge and the use of digital information. Change of era challenging for those in charge of the course. Therefore, curriculum development by changes is the key to attracting learners to study in their courses. In the field of personnel development for teaching staff in music courses, the results of the data analysis revealed that age affects the ability to use technology. Older instructors have lower assessments of their ability to use technology than younger instructors. Online communication channels play an important role in the epidemic situation that occurs during the 2020-2021 academic year, forcing teachers to adjust in teaching and contacting students. This makes teachers have to develop their ability to use technology and digital media by leaps and bounds.

In the issue of activities, Online music performances Found a copyright issue that teachers need to study more knowledge in order not to cause problems later. And have to solve problems such as choosing to publish live performances online through the Facebook page of their music department To avoid copyright issues in some countries Because the song is allowed to be used in an educational, non-commercial manner. There will be no problem with signal suppression in broadcasting. Restrictions on online channels in the show Occur in the interaction of listeners and performers. This is different from live performances in that the actors will be able to know the listeners' reactions immediately, resulting in a natural interaction between the audience and the performer. Music performances through online conference

programs such as zoom can create more interaction between listeners and performers than broadcasting the show online via Facebook (Pattananon, 2022 : 346-357).

Currently, curricula must be developed according to the higher education knowledge standards framework. They should develop their curriculum to be specific and more prominent. The curriculum should be developed to be suitable for the educational institution's area, environment, and social condition to attract learners in the area to choose to study in their institutions.

Piano teaching in higher education

Piano teaching is a compulsory course for pre-school education in higher normal colleges and universities. On the one hand, the basic teaching of the piano can provide a basic guarantee for the smooth development of other courses; on the other hand, it can accumulate more teaching experience for students in higher normal colleges and universities. In the context of the current curriculum reform, traditional education has been unable to meet the teaching standards of cultivating students' creative ability, emotional awareness, and humanistic spirit. Students will learn how to play the piano according to the teacher's instructions and demonstrations. However, students' learning initiatives are not strong, and participation willingness is insufficient. The students can play the piano but usually cannot express the ways in words because their ideas are unclear. In other words, students usually imitate the teachers to play the piano rather than understanding how to play the piano really and understand the theories. As a result, these students will not be able to do the job if they enter society as piano teachers, which will impede the popularization and development of the piano business in China. Thus, teachers of colleges and universities should try to make up for these shortcomings, break through the traditional teaching modes and make bold innovations in everyday teaching to cultivate more qualified piano teaching talents for society (Li, 2018 : 697-701).

The use of music software in piano teaching

The new era of teaching and learning has begun to change dramatically. Because there is a technology that has come in to help to teach more effectively, both in terms of teachers and students themselves can easily access educational technology. Recently, Altron has partnered with BEC-Tero and Sripatum University. Jointly combine technology innovation for the first time with an intelligent piano classroom by delivering an Altron Interactive Whiteboard used with the piano learning course in the project "SPU & BEC-TERO MUSIC INNOVATION PROJECT." The highlight is that it is an intelligent digital music learning class designed so that anyone can play music—using teaching materials through a smart board screen that can quickly write, delete and share information with the students. It can also be displayed on the screen by connecting to a computer or tablet wirelessly. Suitable for students and the general public. The teaching will start from the foundation of music. both theory and practice in the classroom. It makes a difference by combining hands-on and interactive digital teaching, suitable for students in the 4.0 era. Altron smart board comes with 5 lines. Teachers can write music notes on the board. Digital whiteboard and connect with learners in real-time, making classes more innovative and can bring lessons back to use continuously. Along with sharing lessons, quizzes, or e-learning files from the board, scan the QR Code, and the lessons will be

instantly downloaded onto the students' smart devices. Make learning music fun, effective, and easier to understand. It also helps to enhance self-development outside of the classroom and the learner's experience. to fully develop in learning (Daily Gizmo, 2022 : online)



Figure 1, Using Altron Interactive Whiteboard in piano class

The goal targeted by the utilization of music software in education matches with the general purposes for computer-aided education listed (Nart, 2016 : 78-84).

- 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 create the self-learning skills of the student
- To support the development of advanced level thinking skills of students
- To support finding solutions for problems using logic
- To encourage students to establish a hypothesis

Different type of software

Using the software is a wonderful way to learn the basics of music. Using software also frees up time for the teacher and provides students with a well-defined course of study and immediate feedback. There are many types of computer software of importance to musicians. Teachers may wish to consider using three music software with students in the piano studio; educational software, professional music software, and entertainment software.

Pedagogic software is software that is designed to teach something. For instance, an ear training program may train students in the aural recognition of intervals and chords and perhaps offer exercises in melodic or harmonic dictation. An introductory music theory program may provide drills for reading notes in the treble, and bass clefs, recognizing key signatures, and spelling or notating chords.

The study investigating the effects of computerized and traditional ear training methods on the aural skills abilities of elementary music students found a significant difference between the test scores of the control and experimental groups. No significant difference was found between the experimental and control groups regarding their attitude survey results. The results of this study suggest the use of computerized ear training instruction is beneficial in achieving aural skills (Kariuki & Ross, 2017 : 66)

Ear training is essential because listening is a skill—Like playing piano or knowing how to tweak your vocal chain. For example, melodies are just a series of intervals. With interval ear training, you can learn how to play a melody by ear. Recognizing chord progressions by ear is a superpower too. Getting used to hearing common progressions with an ear training tool will change your thoughts about writing songs (Hahn, 2018 : 43). The example of ear training program as follow.

- Tenuto
- Teoria
- Good-Ear.com
- EarMaster
- Quiztones
- Soundgym
- earPlugins
- TrainYourEars

Professional software can be used as a tool to achieve some musical end. For example, there are many music notation programs available today. Notation software is intended to be a tool for notating, editing, playing back, and printing music. Many teachers find it helpful to get their students to do a little composing to stimulate creativity and enthusiasm and help students understand and read music notation.

The research about music notation software as a means to facilitate the study of singing musical scores showed that for most of the variables related to cognitive load, music notation software had less additional cognitive load than musical instruments. Students had no academic music studies, especially when they studied high-level music exercises. In these cases, music notation software was a useful help in supporting music score study (Mar Galera et al., 2013 : 215-238).

The common notation program used in teaching music at higher education levels is as follows.

Notion 6 was the most comprehensive software we tested, packing in all the crucial editing tools you could need. It's adaptable, too, allowing composers to input notes by using a MIDI keyboard, playing virtual on-screen instruments, or placing notes directly onto the digital staves. A recent software upgrade means that you can even use a tablet and smart pen to write your score, as the program is capable of recognizing handwriting.

Sibelius is a serious tool aimed at professional musicians, but it has a surprisingly easy-to-navigate interface, so it doesn't feel overwhelming if you're new to composition. Like Notion 6, this software is regularly updated and tweaked by a team of developers. But we were slightly more impressed with the instrumental sounds available in Notion, and we couldn't find a 'video' window in Sibelius that would allow us to watch a movie and score it simultaneously. So it takes second place in our guide.

MuseScore is free, open-source notation software compatible with Windows and Mac operating systems. Even though it's free, it includes many of the same features and tools found in the best for-pay programs we reviewed.

Noteflight includes the free Noteflight Basic, which allows you to create and edit up to 10 scores. Noteflight Learn is specifically designed for educators. It syncs with Google Classroom and other popular learning management systems. Noteflight Premium is one of the cheapest premium music notation options we reviewed.

Finale PrintMusic has an intuitive workflow and an easy-to-navigate interface. It boasts an impressive set of note entry tools and editing palettes that are easy to find and use.

Forte has two great companion apps: one that scans sheet music using the camera on your phone or tablet and a reader app that opens and plays back compositions from the desktop application with your mobile devices. They are free and available for Android and Apple devices. The desktop application isn't as visually appealing as some of the other programs we tested, but it has all the tools needed to create simple or complex arrangements.

The price of music notation software does vary, with the lower end at around \$100 and the higher priced software breaking the \$500 mark. For basic needs, such as simple compositions for small bands, you will be served fine by the \$200 option (Fender, 2022 : online).

Entertainment software is a program designed for entertainment or game value. For example, a music theory program that drills students on note recognition might have options for timed drills, competitive scoring, animated on-screen characters, printing awards, high scores, etc. Integrating game features into a drill program can make it much more fun (Tecimer, 2005 : 44).

The process of learning and mastering a musical instrument is highly complex and prone to challenges. Students engage with their teacher for a relatively limited time and subsequently undertake long periods of private study based on the guidance received. This time away from formal feedback leaves them prone to bad technical and practice habits, burnout from the solitary nature of the training, and a lack of external motivation to improve. Furthermore, the great deal of time and effort required to master a musical instrument amplifies the effects of the inefficient practice. The highly complex nature of the learned material can lead to a subjective and vague belief in the need for excessively long hours of repetitive training to acquire technical skills. These factors can negatively affect the learner, ranging from frustration from lack of progress, high abandonment rates, and psychological and physiological health problems. Game-based learning solutions are well-suited to address the challenges experienced by the student, capitalizing on constant advances in technology, such as the use of immersive or embodied controllers and interfaces that use gesture recognition as input (Margoudi et al., 2016 : 55).

The software for teaching piano online or distance learning

The study of piano education online showed the advantages and disadvantages of the WeChat software and the MOOC application obtained based on a survey of students. 100% of students said they use WeChat software. According to 100% (328 students) of the respondents, the advantage is free to use. 98% (321 students) noted learning flexibility and ease of use. 85% (279 students) reported high-quality sound and image. 83% (272 students) appreciated instant messages. 75% (246 students) enjoyed integrated screen sharing during the conversation. 65% (213 students) reported call recording. 25% (82 students) enjoyed phone calls and the protection of private conversations. According to 46% of respondents (151 students), the disadvantages are delay and poor audio quality at the beginning of communication. 42% (138 students) - inaccessibility to other incoming calls during a conversation. 35% (115 students) - difficulties associated with reading a text message received during a video chat. 20% (66 students) - lack of round-the-clock technical support. The study results indicate the need for further scientific research to study the features of online piano education to modernize the educational process. In the future, it is also planned to consider the relationship between student motivation and the results of learning to play the piano in the online format. Based on the results, it will be possible to change training programs to improve competencies

The use of online teaching adopts the method of PPT projection screen, which is more conducive to the interaction and communication between teachers and students. Through the Superstar Learning app, students can sign in 10 minutes before class and record in time; during the teaching process in class, teachers can let the students discuss in the discussion area to understand the student's learning situation; live teaching can be conducted through the Dingding app, to understand the student's learning situation more intuitively in the way of talking online, to arrange after-class homework when summarizing after class. It can stimulate students' interest in learning, highlight the key points of teaching, make teaching content specific and visualized, reduce learning difficulty, and improve teaching efficiency (Ding & Huang, 2022 : 1-12).

The Microsoft Teams platform allowed it to conduct lectures, share educational materials, video conferencing, and others. Using the Tonara platform, the educators developed different tasks; involved students in activities with characteristics of a game. The Soft Mozart software was used to teach lessons as a computer game. The combination of theoretical material, exercises, and effective teamwork helped teachers to develop musical skills in two groups. The research identified that 73% of the participants in the first group; 81% in the second group agreed that the proposed distance learning program for piano teaching with digital tools was well-developed; provided them with high-quality educational content (Wang, 2022 : 1-21).

Yuhan Li (2022) conducted a study to solve the problem of repetitive piano lessons and to bring a personalized experience for each piano learner. The application of deep learning (DL) technology for children's piano teaching positively affects their interest in the subject and improves the teaching quality. Music instruments were identified in the system using an instrument recognition model that was developed using deep learning techniques. It was also utilized to help children learn to play the piano by giving them direction and boosting their excitement for it. The proposed model's ability to recognize and acquire features has been improved. The recurrent neural network (RNN) demonstrated instrument recognition accuracy

of 96.4%, and the model's recognition error rate decreased and stabilized as the number of iterations increased. The proposed RNN for musical instruments recognizes instruments by using DL to identify musical properties accurately.

American scientists studied the functional skills of piano playing and their perception by music educators. Functional piano skill is a basic piano musician competency. The components of this competency are performance technique, repertoire, accompanying and functional skills of playing the piano, sight-reading, and generative creativity. Canadian scientists carried out the analysis of the learning environment and motivation in piano education. A common problem among students is dropping out of piano education before reaching an average level of proficiency in the instrument; the reasons for this are decreased motivation and learning difficulties. Work-related issues and self-perceptions of music teachers were studied in the USA. Health problems or stress lead to burnout. There was a correlation between health problems and stress. Thus, teachers with less experience had higher stress levels; female music teachers had more health problems. Scientists from the USA considered the effect of physical parameters on the study of piano compositions. The determining factors are pitch and rhythm, accuracy and fluency of sight reading, and accuracy or smoothness of sound. The importance of increasing intrinsic motivation of students when learning to play the piano was studied by Australian researchers. To learn to play the piano, a student needs to be motivated, and many students need external reasons for this:

- an interview of a teacher with parents and students before the start of training
- a clear explanation of what and how they will learn
- enthusiasm, pleasure, and professionalism
- individual teaching and learning
- suitable repertoire
- managing the expectations of students and parents
- support for students in the context of their choice (to continue or stop learning)

Scientists from the Republic of Croatia studied the satisfaction of piano teachers in music schools. To achieve good results, piano teachers must be satisfied with their work. Piano teachers are moderately satisfied. There are no differences either by gender or by the type of school they teach. Teachers with great experience and teachers who have advanced in their professional fields are more satisfied with their jobs.

Due to the pandemic, the sphere of education and knowledge transfer have switched to different learning formats: offline, online, and blended learning. To transfer theoretical knowledge and gain practical skills, teachers began to actively use digital technologies: distance, electronic, digital, and mobile learning. Modern digital tools are widely used to synchronize effective learning, improve the assimilation of knowledge, and increase motivation. Digital applications, such as Skype, Zoom, Facebook Messenger, Apple Facetime, Google Hangouts, WhatsApp, and others, ensure good quality video and audio content, and allow users to record a lesson and obtain quick feedback (Ma & Ma, 2022 : 7).

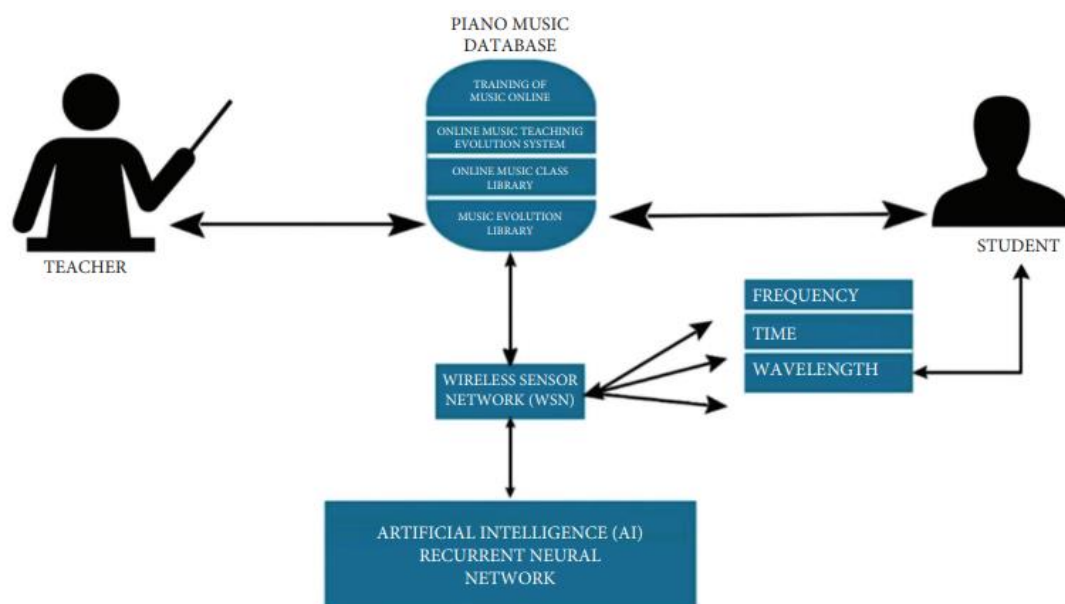


Figure 2, Intelligent piano teaching system (Li, 2022 : 1-9)

Figure 2 represents the proposed model that explains the teaching style for online piano music while using the wireless sensor network. The piano music database that contains online training, an online music class library, online music teaching evaluation system can be accessed by the teacher. This database can be accessed via wireless sensor networks. In general, music data has three essential characteristics, which emits from audio signals. They are time, frequency, and power. To evaluate the performance of music, the recurrent neural network algorithm has been implement (Li, 2022 : 1-9).

Pamela D. Pike (2016 : 107-117) explored the potential for using a synchronous online piano teaching internship as a service-learning project for graduate pedagogy interns. In partnership with the university, a local music retailer, and a local middle school, three pedagogy interns taught beginning piano to underprivileged teenage students for 8 weeks. All instruction took place in the synchronous online environment using acoustic Disklavier pianos, Internet MIDI, Facetime, and traditional method books. As a result of the experience, the students demonstrated musical understanding, and the pedagogy interns developed teaching techniques, displayed improved comprehension of course content, learned about current distance teaching technology, and considered the role of music education in society. Based on these results, providing piano lessons to underserved populations in remote locations might be feasible while offering meaningful internship experiences to pedagogy students through distance service-learning projects.

The application of cultural diversity of music under the basic principles of piano knowledge mentioned above. It is an important trend that causes cultivation in the social context. Each local culture creates a learning process that stimulates knowledge issues and creates appreciation under the same principle as cultural dissemination (Mahittipong & Tengratlom, 2021 : 13-24). The students believed that online teaching piano courses were needed to improve their academic performance, and there were good comments on the teaching

mode of this method, so multimedia online piano teaching still had a certain market orientation (Ding & Huang, 2022 : 1-12).

Conclusion

The use of technology in teaching piano at the higher education level can be divided into two parts: music software in piano teaching, mainly the use of programs to support teaching music skills necessary for music students. To understand and play music according to the goals of teaching and learning, another form of technology use is the use of software for teaching piano online or distance, which is currently very important. The program has not yet been developed to be suitable for teaching piano online. Therefore, it is still something that researchers and academics should focus on and study more deeply. From the current situation, teaching methods and teaching media learning piano at the higher education level need to be adjusted. It is still necessary to develop teachers' abilities to use teaching materials and technology that makes teaching and learning management effective, including developing teaching methods for university instructors and teaching pedagogy of online learning and distance learning.

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