Incorporating technology in teaching musical instruments

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¨Technology inspires art and art challenges the technology¨

John Lasserter, chief creative officer at Pixar

I grew up at a time when today's technology was a product of science fiction. The rapid developments enabled technology to permeate every aspect of life, from medicine to transportation, arts, learning, teaching, entertainment, to name just a few. In the tech-driven world we live in, the machines are projected to change the future of work as we know it. In my presentation I will explore some of the uses of technology with the benefits and limitations, applied to teaching music in general and piano in particular.

The amount of information and research available to us with free access is overwhelming. The internet makes time and distance irrelevant. The tools available, from **eLibrary research**, **CNN Student News**, **Encyclopedia Britannica**, **Fact Master**, **Internet Public Library, iTools.com**, one has seemingly unlimited access to all of that combined knowledge.

More particular for music, there are available sources offering instructional videos like: **Online Music Lessons**, **Your Space Music Lessons**, **musiclessonsanywhere.net**, **web lessons** and **MusicTutorial.in**, **keyboardwellnessseminar.com**, **musictechteacher.com, musicgamesonline**, **MusicLearningCommunity.com**. **YouTube**, the worldwide social networking website where anyone with internet access can upload videos, is a handy source for the music student wanting to become familiar with new repertoire. With its universal music library, even though the quality of the presentation or interpretation may vary greatly, it still allows one to hear and compare various pieces of music. **Wikipedia**, the largest reference work, ranked among the ten most popular websites, covers a great variety of subjects, from music history to theory to pedagogy or music notation, instrumentation, composition, etc.

For teachers, learning is a lifelong process, offering renewal, inspiration, validation. Between participating to conferences, subscribing to professional magazines, using online blogs, webinars, e-journals or e-conferences, they can stay in touch with the musical world's latest developments. Another useful tool is a personal website, as students and their parents can stay updated regarding events, dates and other useful information, without the teacher having to contact everyone individually. In addition to that information, I also used it as a source for my students to download practice tests in preparation for the yearly theory tests for one of the state programs they were enrolled in. The students today learn to communicate information very differently than we used to in school or music lessons and it seems that technology dictates the way we learn. Actually we have already accepted and used it in many aspects, like email and social media, so it would be just natural to use these tools and mix them with our traditional methods of teaching.

Faced with the situation of a student's family relocating to the other coast, we looked into the possibility of continuing learning together through skype. As I learned from other teachers' experience, this may be the solution when the distance or the area doesn't give the student access to a teacher. To the student's

advantage, it doesn't require extra time or transportation and he can use the instrument he practices all the time, thus increasing the sense of wellbeing by not having to adapt to another instrument and being in the scrutinizing presence of the teacher. Through *Call Recorder for Skype,* a program for Mac that enables you to record audio or video, the lesson can automatically be recorded, so it could be reviewed and instructionally reused later. Probably this works well with language lessons, but when I first tried to teach a piano lesson, the sound quality was inferior for both voice but especially for the piano, really crippling my ability to offer much instruction. After that I was trying to get *Discord*, the chat and text site for video games, which had an amazing audio quality due to the options it has to disable some of the algorithms, making the sound very clear. The drawback right now is the fact that they don't offer video option. Finally I turned to and successfully used Face Book's *Messenger* built-in video chat. Even with just ordinary headphones, the sound was pretty clear, but I opted for monitor headphones which improved things even more. The image and the sound were pretty good and after the initial few minutes when our calls wouldn't go through, once the connection was established, we were able to have a rea\sonably productive lesson. On this feature too, the student has the ability to record the lesson. I believe that more work needs to be done to differentiate between voice and music: the technology needs to adapt and allow the dynamic spectrum to be optimized to approach the similar sound fidelity of the traditional, acoustically characteristic piano sound.

Next to these advantages, certain challenges are particular to this setting: you need a decent internet connection, a webcam, and to have the technical acumen to deal with the glitches that will inevitably appear, as I already encountered.

I do believe that the communication between student and teacher suffers and is less effective because of the distance and how they see each other through the screen. I know how I am able to "read" a student's state of mind as soon as she or he enters the room. Based on that realization I can alter my approach and plan for the lesson and adjust it to the current need. But again, what if a quick look at social media outlets like Facebook, Tweeter or Instagram would give me some insight, as people open up and share important things in their lives that could affect their wellbeing? Thus alerted, I could respond accordingly.

For now, as I already mentioned, the sound of the instrument, even though the teacher can access its quality in general, will not show the subtleties you can hear when you are in the same room, as I was able to realize. In my teaching, next to the verbal instruction, illustrations and engaging the student in a dialog, I like to demonstrate my suggestions by playing. With a reduced fidelity of the sound, my suggestions are less effective. I understand that the latency problem, in being able to communicate in real time and not have awkward pauses – as each, the student and the teacher end up waiting then talking at the same time – is being solved by the advance of technology. But right now, as I was observing my student, I first heard the sound then I saw the fingers moving. I will try to focus more on my listening, because not being to accompany my students in preparation for their concerto competitions or performances, an exhilarating experience that takes time and effort, is a serious setback.

While Skype/distance lessons give the ability to ensure continuity, consistent instruction and accountability, there are some drawbacks that the technology still has to solve. And as one teacher shared, the fact that it is relatively easy to set up the skype lessons, it was equally easy for them to disconnect, as shown by the rate of the students quitting. Not the least, is the extra effort the teacher needs to put in as everything takes more energy to accomplish, as one, aware of the distance, tries harder to make himself

heard and understood. But in the end it is comforting to know that without having to leave our homes, by turning on our computers, we have sowed a seed, we have reached someone and connected them to the beautiful art of music.

So, at this time when students are connected to a modern culture that offers modern tools, it is worth looking at them to see what challenges, potential and opportunities they can bring. I confess I am often confused and frustrated by technology, but I am willing to learn ways of mixing the traditional methods with the more innovative, new ones. Then, what about **Artificial Reality**? Virtual experiences are used in video games, so familiar to the young generations. What if we could be able to use them in our teaching? There are three different types of Artificial Reality: **Virtual Reality**, **Augmented Reality** and **Mixed** or **Merged Reality.**

Virtual Reality is a fully enclose synthetic experience with no sense of connection to the real world; a computer technology that simulates a 3D image or environment we can interact with, using a head set or helmet, seemingly taking you in the middle of the action. In it, the user is immersed in the digital reality without the natural surroundings. In the **Augmented Reality** the real world remains central to the experience, being *enhanced* by the virtual details, as the digital part is superimposed over the user's physical world. The difference between the two is that "AR enhances one's current perception of reality, while VR replaces the real world with a simulated one".[1] "They are", as Rob Catto, Director of Simulation at Full Sail University – Florida, says, "simple screens into a virtual world".[2] Finally, in the **Mixed Reality,** also called hybrid reality, the *real* and the *virtual* reality are combined, resulting in the interaction with and manipulation of both the physical and the virtual environment.[3] So it seems that as the technology is leading into a future where as VR becomes part of people's everyday life, more and more they may prefer spending time in their virtual space. The futurist Ray Kurzweil is predicting that "by 2030, VR will be totally realistic and compelling and we will spend most of our time in virtual environment…we will become virtual humans".[4]

If this thought can be alienating, there are, though, real beneficial applications of technology, with results otherwise impossible to achieve. In medicine, VR and 3D printing are used for heart treatments. Mixed Reality can replace real patients with "artificial" ones as teaching tools.[5] In commerce, Ikea, in partnership with Apple, will be using AR to help buyers choosing their products: "the plan is for the customer to take photos of their own homes and to use the app to position photo-realistic renders of IKEA products where they want in their home".[6] In sports, the German National Soccer Team will use VR to

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[1] Steuer, Jonathan, *Defining Virtual Reality, Dimensions Determining Telepresence* (Derp. Of Communication, Stanford University, 1993)

[2] Bonazio, Alice, *"A Florida University is Quidditch is making (virtual) reality"* https://qz.com/1007518 June 17, 2017

[3] P. Milgram and A. F. Kishino (1994). "*Taxonomy of Mixed Reality Visual Displays*". IEICE Transactions on Information and Systems. pp. 1321–1329. Retrieved 2013-10-17.

[4] Ray Kurzweil, *Foreword to Virtual Humans* "http://www.kurzweilai.net/foreword-to-virtual-humans (Oct. 20th, 2003).

[5] "How Reality Technology is Used in Healthcare" *Reality* Technology, http://www.realitytechnologies.com/healthcare

[6] Ben Lovejoy, *Ikea to be Apple launch partner for AR, showing virtual...* "https://9to5mac.com/2017/06/19/ios-11-apple-ar-augmented-reality-ikea-app/" (June 19th, 2017)

train its players[7]. "The field of <u>geography</u> and <u>map making</u> have been transformed by the computer-assisted approach to collecting, layering, visualizing and displaying the data through geographic information systems (GIS) that creates precise, three-dimensional representations of the world for goals that range from saving the environment to reducing the crime".[8] In <u>musical arts</u>, composer and conductor Eric Whitacre was able to bring together, in his TED talk, through skype in real time, 32 singers from around the world to sing with the choir onstage performing the composer's piece *Cloudburst* based on a poem by Octavo Paz; or the April 2011 occasion when he conducted a virtual choir of 2,052 people from around the world performing his choral work *Lux Aurumque*, merging hundreds of tracks individually recorded and posted on YouTube. I am confident that soon there will be available the technology that can help a pianist or other solo instrumentalist to practice with a virtual orchestra in preparation for a concert. Or to be able to virtually transport yourself to the performance hall of your next concert, to practice in advance and calm your anxiety as you experience a realistic "dry run" and get ready for the real one.

In the classroom, with all these technological advances, the teacher/student relation is shifting from the traditional model where the teacher gave the information the students needed to absorb, to the role of guiding the students to "navigate the limitless landscape of information and to engage with digital tools that provide a richer learning experience"[9] So a setting called "flip classroom" is being offered in which the teacher records a lecture that the students can watch at home, using the classroom time instead for working with those needing help with their assignments.[10] For the music students, they can use right now technology to compose, record, playback, experiment and create as their intuition and imagination allows them.

If the technology helps with the learning process, ensuring accuracy and speed, offering sources with historical and biographical content as well as formal analysis, there is still, the artistic aspect – achieved by guidance, talent and experience as well as knowledge acquired by time and a lot of hard work. Artistic playing combines technique with personal understanding, intuition and expression, making each performance individual and unique. That cannot be taught by a computer, or at least not shortly. A nurturing and encouraging teacher would be able to assess the students' capabilities and stimulate their imagination, fostering the development of their expressive abilities. For example, I enjoy using poetry in my teaching, as the means of expression in both mediums leave a lot of room for imagination and interpretation.

I believe in and welcome the fact that technology can offer tremendous help with various learning styles, and will become more and more part of our life, from the information available, to being able to connect anywhere in the world; but it will never replace our one on one time together. What we receive through human presence, touch and empathy cannot be obtained through a machine. The artistic imagination and expression, so uniquely human, comes from sharing our collective experience with its joys and sorrows, triumphs and defeats. People may not want to choose to turn to technology instead of interacting with each other. I would like to conclude with the thought that I believe that for the future we will continue to

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[7] Josh Katzowitz, *The German national team will use VR to train, and it could change soccer "http://bit.ly/2tgaKOJ" (June 17th, 2017)*

[8] Ochtamale, *Digital disruption #1: Mapping the past, present, future* http://ochtamalemagazine.net/digital-disruption-1-mapping-the-past-present-future/ (June 22, 2017)

[9]Howard, Nicol. "Unleashing student potential in the digital classroom" p.30

[10] Howard, Nicol. "Unleashing student potential in the digital classroom" (p.2)

teach piano or another instrument by using technology in ways that are continually improving, in parallel with the traditional way, with students and teachers benefitting from the best of both worlds, resulting in higher quality of experience and outcome for all. Who could say it better that Steve Jobs, revealing his goal in all the companies he created, to combine technology with humanities: "It is in Apple's DNA that technology alone is not enough - it's technology married with liberal arts, married with the humanities, that yields us the results that make our hearts sing."

References

[1] Steuer, Jonathan, *Defining Virtual Reality, Dimensions Determining Telepresence* (Derp. Of Communication, Stanford University, 1993)

[2] Bonazio, Alice, *"A Florida University is Quidditch is making (virtual) reality"* https://qz.com/1007518 June 17, 2017

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[9] Howard, Nicol. "Unleashing student potential in the digital classroom" p.30

[10] Howard, Nicol. "Unleashing student potential in the digital classroom" (p.2)