On learning electronic media production as an experienced musician

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ABSTRACT

Electronic music production (EMP) is an increasingly popular avenue for music expression, yet learning this skill has a high barrier to entry. The paper presents research methods investigating the idea that existing musical knowledge aids in the learning of electronic production. It was discovered that while existing musical knowledge is useful for learning, the EMP skill set is quite different and relies heavily on technical skills. The most popular tool for musicians who start to learn EMP, Ableton Live, is expensive and does not currently incorporate education technology (edtech). Research and analysis indicate that the process for musicians to become proficient in EMP is cumbersome, and that simple tools could be developed to improve this process.

Author Keywords

Music; education; educational technology; digital audio production; Ableton Live; electronic music.

ACM Classification Keywords

H.5.2: Information Interfaces and Representation: (User interfaces-Interaction styles); J.5: Computer Applications (Arts and Humanities-Performing Arts); K.3.1: Computer Uses in Education (Computer-Assisted Instruction).

INTRODUCTION

There's plenty of research about bringing technology into traditional music classrooms. There are also plenty of tools called digital audio workstations (DAWs) for facilitating electronic music production. This research interest bridges this gap.

The developed hypothesis was that existing musical knowledge aids in the learning of electronic production. The independent variable is the presence/absence of musical experience, and the dependent variable is the level of difficulty for learning electronic production. I was interested in learning about how helper tools can be created using existing technology. Additionally, I planned to discover how educational technology can supplement this learning process, for people of all experience levels.

My research process began with learning about related work in this field. I then developed four research methodologies to test my hypothesis: a survey, interviews, class observations, and analysis of existing music tech user interfaces. I executed these in order, starting by surveying musicians and music educators from a variety of backgrounds to see what tools currently exist for collaboration and what types of tools would further facilitate this transference of skill.

RELATED WORK

Here, I define "traditional musical knowledge" as "experience with brass, percussion, string, or woodwind instruments; sheet music; or music theory." I define "electronic media production" as "digital audio production and live multimedia presentation."

10% of people ages 18-49 in the US have played a musical instrument in the last twelve months [10]. The percentage of active music technology users is a smaller subset of this group. Even so, electronically produced music dominates our radio waves and Spotify playlists and impacts every musical genre.

Traditional methods of learning music are in many ways similar to the traditional methods of learning anything else in school: through taking courses and private lessons, and over time specializing in a certain field [13]. Complementing this is "musical enculturation," or the acquisition of musical skills by immersion in the everyday practices of one's social context [4].

A powerful aspect of music edtech tools is that they can help students learn both remotely and while physically together. That said, existing tools like video conferencing leave much to be desired in terms of facilitating an optimal learning process [3]. Even when students are colocated, apps that couple traditional curriculum with technology can be a cost-effective lever to improve student achievement [6].

I also found it important to confirm that learning music remotely can be comparable to learning music in person. In some cases, remote learning is the only option for students in sparsely populated geographies who want to learn more advanced music topics [2]. While limited studies have been done on online learning for the subject of music, fortunately, studies have been published for other subjects. For example, when comparing performance outcomes of students in an online introductory computer science class to students in a traditional class, Joyner finds that students in the online section learn just as much and enjoy the experience more [5]. The fact that learning outcomes can be comparable, as well as more fun and flexible, bolsters the case for further work in this area.

Studies of online music composition environments show that not only do musical collaborative tools assist students, but students also agree that the work they make together is "different" from something they would have made on their own, and their process for making it was different as well [8]. Novel technologies will change the way that music is created entirely; people with no musical or even direct technological experience will soon be able to input their ideas by making simple sounds and transform these snippets into full-fledged music with little effort [9]. Lowering the bar for musical creation increases its accessibility, and is a prerequisite for allowing people of different abilities and backgrounds to learn EMP.

The success of technology for facilitating traditional musical learning and the continued emergence of tools for music creation led me to believe that technology can also aid in the transfer of traditional musical skills to electronic production skills.

RESEARCH METHODOLOGY

My focus was on discovering how musicians learn new skills using their existing experience and knowledge and learning how musicians collaborate using technology. This type of collaborative learning is already occurring online to learn music and gather feedback [12].

My research method consists of four main steps. These were executed in the order presented below, with each preceding method informing the others.

Method 1: Survey

I began by creating and administering a survey in order to gather quantitative and qualitative data. My target demographic is traditional musicians in the USA, ages 18-49, of all skill levels.

The participant data I collected includes user demographics, perceived level of traditional musical expertise, methods employed to learn their existing musical skill sets, level of experience with electronic media production, perceived level of difficulty learning electronic media production, perception of the process of learning electronic music production.

Method 2: Interviews

Building on the data I collected from my survey, I performed interviews with people who have successfully bridged the gap from traditional to electronic music. My goals were to learn about motivations in learning the new skill set, their level of experience with traditional music skill, what tools they used for learning electronic music creation, the importance of their traditional music knowledge in learning electronic production, and the importance of collaboration in creating electronic media.

Method 3: Class Observation

For this method, I observed teachers in the electronic media space while they were conducting a lesson. Lessons were instructed by electronic producers with experience teaching music and taught one-on-one to advanced traditional musicians with little to no electronic media experience. I documented which technological tools are used to teach this skill, which traditional music concepts are referenced during the lesson, what questions the students ask, and how students collaborate with teachers and other students to enhance their own learning outcomes.

Method 4: Analysis of existing edtech interfaces

I investigated existing music educational technology application interfaces that aim to teach students how to

make electronic music. Particularly, I documented how to begin using the apps (in terms of installation and onboarding process) and what features differentiate these kinds of apps.

I found these apps through my interviews, and by searching for keywords such as "music app" and "electronic music tool" using a search engine. For this project, finding numerous and varied existing user interfaces (UIs) was inexpensive.

RESULTS

Method 1: Survey

In total, 61 people took my survey on PeerSurvey. The results of the survey indicate that the audience that took the survey is predominantly young adult males (18-39). The average experience with music is 8.8 years; the median is 4 years (Table 1). 56% of the audience has not yet developed EMP skill, and the users that have learned EMP are mostly focused on electronic audio production (Figure 1). The average musical skill level is Intermediate (Figure 2).
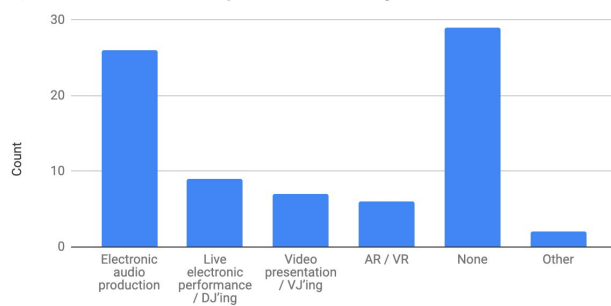
Q: What kind of media production have you learned?

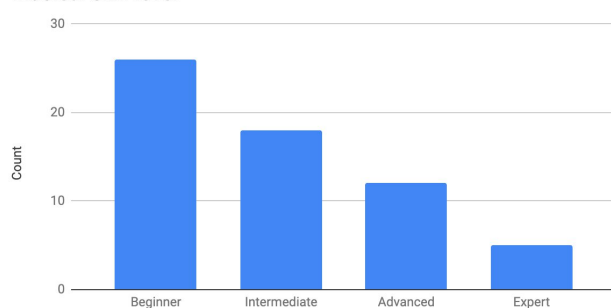**Figure 1. EMP skill set breakdown**

Musical skill level

Figure 2. Self-reported musical skill

The most common methods of learning music are by being self-taught and through private lessons (Figure 3); online tutorials are the most helpful tool for learning EMP (Figure

4). The most common EMP experience that is known and is desired to be learned is electronic music production.

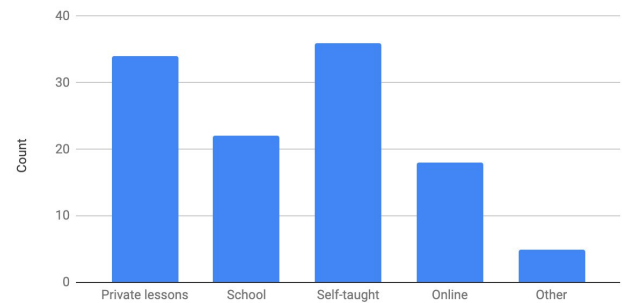Q: How did you learn your current skill set?

Figure 3. Method of learning music in general

Q: What kind of tool(s) would help someone who has traditional music knowledge learn electronic music production?
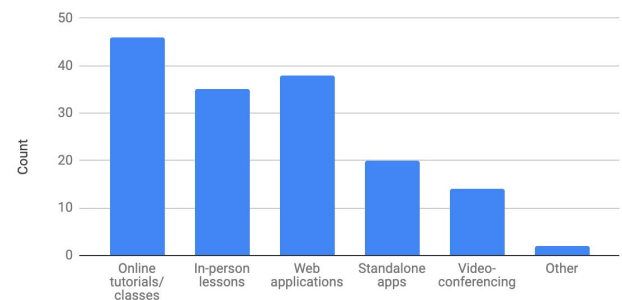
Figure 4. Method of learning EMP music

On average, my audience generally agreed that existing musical knowledge is helpful in learning EMP (Figure 5). Generally speaking, there were mixed feelings on the matter. This is later confirmed during my interviews and class observations.

Do you agree that existing musical knowledge is particularly useful in learning electronic media production?
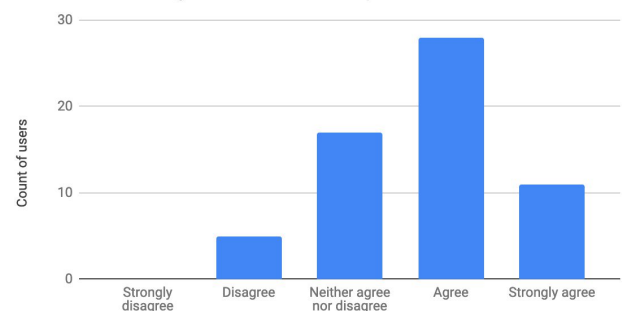
Figure 5. Self-reported existing musical knowledge usefulness for learning EMP

When asked: "Which technologies do musicians use to collaborate with each other?" the most common response is "Not sure." This is noteworthy, as these are musicians with an average of 8.8 years of experience (Table 1).

Statistic	Value (years)
mean	8.8
min	0
median	4
max	35
stdev	9.6

Table 1. Statistics for users' musical experience

The results of this survey began to confirm my hypothesis that existing musical knowledge is useful for learning EMP. The results of the survey indicated that traditional musicians begin to learn EMP using YouTube videos or picking up tips from a friend. The survey raised questions as to how students could most successfully learn EMP given that most people self-teach this new skill, which I was sure to ask in my next two methods.

Method 2: Interviews

Ableton Live (Ableton) is the most popular DAW for the musicians that I interviewed (Figure 6). Using EMP to combine sounds with traditional music is a popular reason for getting started Ableton. As articulated by one of my interview subjects, the ability to produce an entire track "by yourself is considered a huge milestone for learners."

Figure 6. Ableton Live UI

Since Ableton emerged as the most popular tool from my survey, I asked all of the musicians how they may go about learning how to use this tool. Incorporating edtech tools directly into the DAW was proposed by two interview participants as a natural way to learn this new skill. A "Virtual Studio Technology (VST) plugin focused on teaching and gamification for new skills" was of particular interest to multiple interviewees. Another idea suggested by participants that's a bit more greenfield is "serving a DAW like a web app so that people across the world can work on

the same audio file in real time." Cost was mentioned by everyone as a barrier to entry for learning EMP.

Participants had mixed opinions on whether it is helpful to have existing musical experience. Some said it was extremely important, while others said not at all because it's about learning how to use software and technology. Without the presence of musical experience, three participants mentioned that they "may have not started learning EMP in the first place."

"Live, in person collaboration between student and teacher" was mentioned as an effective way to quickly learn new skills. This is in part because even experienced musicians may not have exposure to important EMP concepts, such as "gates and low-frequency oscillators." This information fueled my class observation method.

I also received mixed reviews on whether they find it helpful to collaborate. It was also mentioned by an interviewee that "communities of practice are helpful for sticking with a plan to learn EMP." The tool mentioned for collaboration the most was email.

Method 3: Class Observation

I shadowed three electronic music production lessons, each with a different focus: (1) a self-described non-technical person using Pyo, a Python tool for digital signal processing; (2) a new user lesson using Ableton; and (3) an experienced user lesson using Ableton.

It was discovered that many of the EMP skills needed are more technical in nature as opposed to requiring prior musical knowledge. Specifically, knowledge of how to work with software, how to operate in a command line, and memorizing hotkeys is crucial for using Pyo (Figure 7).
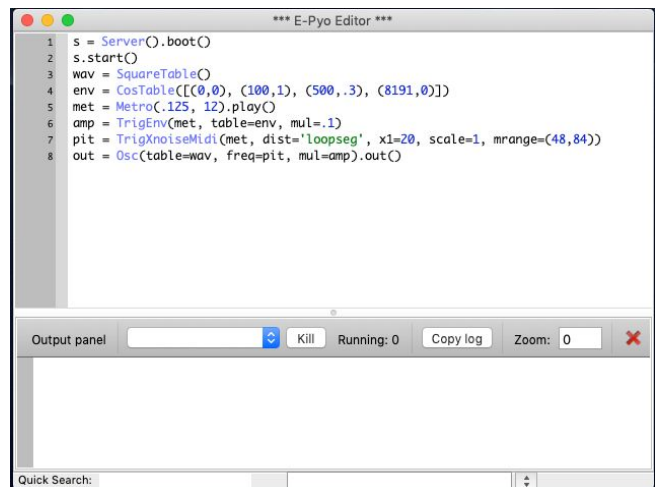

Figure 7. E-Pyo editor UI for Mac OSX

"Musical confidence" isn't as transferable to EMP as "general music skills and knowledge" are. Knowledge helps to make simple melodies and is less effective for actually creating a full track, which requires more confidence built via practice. This became clear in both the new and experienced user lessons, as creating a short (30 second) song from scratch required significant time investment for experienced musicians, regardless of experience with EMP.

I discovered that only the Ableton software (or a comparable DAW) is technically required for getting started with production; the hardware is all optional. The process of rebuilding a reputable Ableton plugin from scratch was shown to both help to teach core EMP concepts, as well as explain how Ableton functions work to build toward a track.

Method 4: Analysis of existing edtech interfaces

After researching many different options for learning EMP, I settled on three to analyze and compare: Ableton Live Learn, Splice, and Academy.fm Masterclass [1]. A summary of the different features offered by each interface is summarized below in Table 2:

	Ableton Live Learn	Splice	Academy.fm Masterclass
Medium	Instructional videos	Interactive app	Instructional videos
Installation	None	Desktop installer	None
Scope	Ableton lessons	Editing tool	Ableton lessons
Cost	Free	$13.99 / mo	$347
Interactivity	None	Web / Desktop Application	None
Collaborative Features	No	Yes	No
Built into DAW?	No	No	No
Differentiation	Created by Ableton	Collaborative editing	Clear learning path

Table 2. A comparison of existing interfaces

These tools all provide ways of learning how to use Ableton online, without a teacher. Ableton Live Learn and Academy.fm provide videos that users watch and then emulate within the Ableton software (Figure 8).

Using 3rd Party VST Plugins in Ableton Live 10

Figure 8. Academy.fm video

Splice takes a different approach. While not strictly a learning tool, Splice provides a way for users to preview sounds, collaborate with others, and back up changes to the cloud [11].

Even if these tools do not technically require Ableton to use, all greatly benefit from interactive use with Ableton installed. On top of the cost of these tools, Ableton is paid software that costs between $99 and $749 for a license [7]. Furthermore, none of these tools are actually integrated into Ableton itself, which increases context switching and complexity for learners.

The desire for a native VST within Ableton itself, which was mentioned in my other methods, is sorely needed given the current landscape of music edtech tools.

LIMITATIONS

Two recruitment methods were used to source participants for the survey. The first was PeerSurvey, a survey tool used by Georgia Tech students to administer graduate student research surveys. The second was a post to relevant forums on Reddit: EDM Production, Music Production, We Are The Music Makers. As such, my user base included mostly users of Reddit and Georgia Tech graduate students.

Additionally, the interviews and class observations were completed in-person with residents of Austin, Texas. Future iterations would seek to cover broader demographic range in terms of gender and location.

FURTHER WORK

Building a new VST or music edtech tool is outside of the scope of this research project. My wish for the future is for developers to use my research to build an open source VST, in order to help musicians learn Ableton in a cost-effective and unobtrusive way.

Specifically, I envision this VST to guide new EMP students through the process of creating their first song. It would have users create one "audio track" for each instrument, and teach users how to add effects like reverb and delay. It would eventually show users how to export the song as a WAV file, and give instructions for how to upload the file to an online streaming platform. The VST would also highlight the most common menu items and shortcuts used to edit tracks so that learners can quickly master common shortcuts from the beginning.

CONCLUSION

People start learning traditional music as children, in school or during private lessons. They want to learn electronic music production as a way to advance their skills and do more of the music making process on their own. EMP requires only a laptop to get started, and it's a more modern and relevant skill than traditional music composition in today's technology-driven world. Musicians typically learn this new skill by being self-taught online. They use tools like YouTube and email, which are not music tools or even edtech tools.

The most popular tool for musicians who start to learn EMP is Ableton Live. This software is expensive, has a steep learning curve, and does not have education technology built into it. Multiple people have suggested during my research that an "edtech VST plugin" for Ableton would be a cost-effective way to self-teach learning this software, which is crucial as most of these musicians are self-taught when learning EMP. My research and analysis indicate that simple tools could be developed to improve the experience for musicians who want to become proficient in EMP.

While existing musical knowledge is useful for learning EMP, this skill set is quite different from traditional music ability and relies heavily on technical skills. As such, I conclude that musical knowledge only partially aids in the learning of electronic production. This was confirmed by all three of my research methods which involved other musicians.

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