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Understanding the Potential of Music Learning Application as a Tool for Learning and Practicing Musical Skills

Yun Yi Tan & Sinthu Thiruvarul

yunyi.tan@usm.my

Centre for Instructional Technology & Multimedia, Universiti Sains Malaysia, Malaysia

Abstract

This paper explores the potential of mobile applications that are developed to assist music learners in learning and practicing musical skills. Specifically, it attempts to shed light on the affordances of such mobile applications in elevating guitar skill learning among guitar players. This paper presents case studies of four guitar players who have used a mobile application namely “Yousician” to facilitate their guitar learning and practicing process. Findings of this study are drawn upon an investigation into their uses of the mobile application over a practicing period of one week. The study will also provide insights on the characteristics of such application from the music learners’ perspectives. It is also anticipated that findings from this study could contribute towards the understanding of the characteristics of mobile-based music applications that could potentially assist music learners in informal learning environments.

Keywords Music learning; Mobile application; Music skills; Yousician

Introduction

It is only fair to say that it is a golden period for people who love music, also known as melophiles, to be born in the 21st century as there are limitless choices to choose from when it comes to being a self-taught musician (Tobias, 2014). Moreover, a rapid increase in the use of digital learning environments can be seen when it comes to music education. According to a New York news article by NASDAQ OMX Corporate Solutions, Inc (2019), it was highlighted that online music learning market was to witness a steady increase at a rate of 6.1% globally from 2018 to 2025.

However, according to a recent case study by Ruokonen et al. (2019), the results indicated the need to develop sustainable music learning environments for users to learn music anytime and anywhere. This is where music learning applications are seen as the potential tool as they could easily be downloaded to mobile devices and accessed as per learners' convenience. It is also key to consider music learners' experiences when not only learning but practising as well. For instance, Birch & Brett (2019) stated that regular practice is needed when learning music, especially when it comes to acquiring the skills and technical expertise. However, they also highlighted that music students tend to find that the practices are boring. Indeed, a suitable platform for music learners to learn and practice music should be reconsidered by addressing the learning needs.

Concerns over the music learning process is also echoed by researchers in the field and they have attempted to conduct studies on developing on a gamified approach for music learning and practices. Ruokonen (2019) also studied on learners' experience learning music in a web-based environment. The learners evaluated their experience of learning music in a web-based learning environment. This was done to discover the needs of music learners to aid in developing digital learning environment for music. As a result, it was concluded that digital learning environments not only enhances learning experiences, but also motivates a lifelong informal music learning.

In the recent times, there is also a trend of developing music learning application using gamification features as discussed in the background of study (Birch & Brett, 2019; Caruso et al., 2019; de Villiers, 2018). It is found that the trend of adding gamification element to the music learning application has the ability to support learning in both formal and informal learning environments. However, the studies focus more on developing gamified mobile applications and there is more emphasis on building the application to suit the learners' needs rather than an exploration on how learners use such applications from the learner's perspective. Therefore, this study is an attempt to explore how music learners use an existing digital music learning platform to learn music. Due to the qualitative nature of this study, it should be noted that it does not intend to generalise its findings to all music learners and learning applications, but rather, demonstrate considerable opportunity for instructional researchers to engage in qualitative approach to studying such learning platform.

The following research question is developed to guide this study: What are the characteristics of a mobile based music learning application that support the music player's learning and practice process?

Literature Review

Music Players and Music Learning

With music comes music learning which is mainly broken down into three methods, formal, informal and non-formal learning. Formal music learning can be described as very routine, formal and organised, conducted in compliance with fixed rules and predictable order. Formal learning is connected to schools and educational institutions, from lower primary schools to the university's upper tiers (Mak, 2007). This means a learner that wants to learn formal music will attend classes with certified instructors in educational institutions, sometimes catering specifically to music education. These learners mostly pursue classical music as stated in (Vitale, 2011), there is scholarly consensus that formal music learning is associated with classical music where "Most music teachers in schools – public and private music schools – are trained in Classical music, and school music curriculum has typically favoured Classical music". Formal music education in Malaysian schools is considered a fairly recent development (Johami Abdullah, 2010) and the reasons for this includes the Malaysian education system which does not highlight the importance of the arts and sciences as part of a balanced education.

Informal music education exists in social encounters between family members, acquaintances, co-workers as well as other groups of peoples in various communities. The world of informal music learning is often connected to popular music forms (Vitale, 2011). Non-formal learning means a type of education that is fairly systematic and (but not necessarily) pre-planned, with the learner and teacher's specific aim to fulfil a particular learning goal (Mok, 2011). Training in both informal and non-formal music occurs outside of formal education settings. There is a more contemporary nature to the current pattern of musical choice among Malaysians, particularly the current generation (Abdullah, 2007).

In the scope of formal music learning, one of the barriers to a learner improving his/her music skills are the lack of competence and confidence of educators teaching music. A learner can go to many sources to obtain musical knowledge. One of the basic avenues is attending musical classes in school and taking up musical subjects offered in primary and secondary schools in Malaysia. However, in certain cases this may be a problem as some educators have low teacher confidence stemming from insufficient depth of knowledge in the music domain. For example, a new music curriculum was introduced in the Malaysian public schools around 1996, which brought new direction to the conservation of Malaysian music as well as western music theory. The main problem that arose from this implementation was the lack of qualified music teachers to teach the subjects. To overcome this problem there were selected "instant music teachers"

who were given short courses on how to teach music at the primary level. To be a music educator, one must be a musician, preferably an expert in the music domain in order for learners to gain better understanding as they learn musical theory and concepts. Negative interest and poor attitude towards music among some of the "instant music teachers" give the subject a second-class status in schools (Abdullah, 2007). Selecting individuals with little to no understanding and knowledge to these musical theory and concepts causes learners to not improve in their musical skills.

For a musician to first learn music he/she must have the fundamental knowledge of the aforementioned elements of music which constitutes music learning. Therein lies the difference between music learning and music practicing. A music learner who has no prior knowledge of music does not know the elements of music including pitch, harmony and timbre whereas a person who has prior knowledge of these element and want to perfect their craft would fall under the category of music practicing. However, these two concepts often go hand in hand because learning is a continual process and practicing is a need to enhance an individual's skill. Practices are seen as active learning processes to strengthen and retain focus. When it comes to music, even popular musicians put hours to perfect their skills (Vasil, 2015). However, one particular aspect to be noted in the study is that the participants from Vasil's study who were popular musicians, were considered self-motivated musicians. This touches the motivational aspects of a musician which is believed to be the driving force towards music learning and practice.

Music Learning and Music Learning Applications

A recent study by Caruso et al (2019), studied on developing a gamified solution based on Gordon's Theory which focuses on learning through sound above merely learning through musical notations. The study developed prototypes of a gamified mobile application called the CrazySquare to approach learning music and musical instruments. The prototypes comprise of game elements such as levels, immediate feedback, riddles for the first prototype and immediate feedback, points, rewards and unlockable contents in the second prototype. The study is specifically targeted at young Italian adolescents aged 10-13 years of age. The gamification idea behind the developed prototype was to teach music based on Gordon (2007) music learning theory, an approach where musicianship is taught through "audiation"; a term used describe the process of comprehending music through hearing when the sound is not physically visible. For instance, playing something, you hear in your head. Audiation takes place when we hear and comprehend music for which the sound is no longer or may never have been present. One may "audiate" when listening to music, performing from notation, playing "by ear", improvising, composing, or notating music (Gordon, 2003). The concept of gamification implemented in the prototype has resulted in positive impact on learners in terms of their attitude, motivation and performance towards learning music. The researchers of the study then stated that they have planned to further their evaluation by conducting a test of the prototype with end users.

De Villiers (2018) also developed an interactive application for music tuition, called “PianoBoost”. Gamification was used in the development of the Android mobile application for music tuition. The problem of music learners that are unfamiliar with basic music notations are what drove the researcher to develop the application which was launched on GooglePlay Store in 2017. The application was developed to aid learners to learn music notations in their own momentum in order to utilise the actual teaching environment for other learning purposes. Indirectly, the application aims to boost independent practice out of formal music lesson hours. Both of the studies revolve around developing a music learning application with gamification features. However, there is little to no emphasis on how learners used the application for music learning. The researcher views this as an area to explore when conducting a study on music learning application.

In the Malaysian context, a study was carried out on the effectiveness of e-learning on music theory and appreciation achievement of form 1 Malaysian secondary school students back in 2010 (Md Noor, 2014). The researcher suggested that the study to be replicated to include mobile application as back then smartphones were still not big among consumers. The researcher also believed that smartphone technology, music lessons can be accessed anywhere. Thus, increasing the motivation to learn music. The recommendation from this study further motivated the researcher to look into this area of study. The researcher found a need to explore music learning application among music learners. (Md Noor, 2014) also suggests investigating into other dimensions such as learning activities, interactivity, users’ engagement, assessment and feedback. This directed the researcher to set gamification as one of the main criteria when selecting a music learning application.

Another study that was carried by Margoudi et al., (2017) was to co-create a gamified solution for music learning. This study derived that it is important to understand the target end-users and that game-mechanics should be applied with a purpose or else it would simply be “just a game”. This has brought the need to examine music learners’ perspective when using a music learning application for learning and practising purposes.

1. Yousician

Yousician is the largest digital music education platform in the world (CanadaNewsWire, 2016). It is an application that gives real-time feedback on timing accuracy upon listening to any instruments through a mobile or even desktop. It uses the built-in microphone of the user’s device to provide feedback on his/her accuracy and timing. Currently, the application features learning four musical instruments; guitar, piano, bass, ukulele and also vocal.

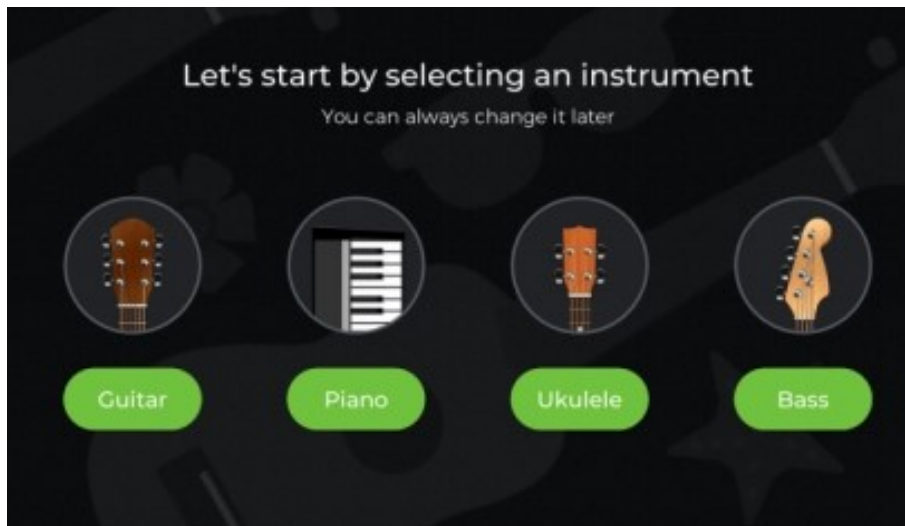


Figure 1 Choice of Musical Instrument

This application tailors' lessons and practices based on users' performance with over thousands of songs, exercises, lessons and workouts. Progress can be tracked and monitored.

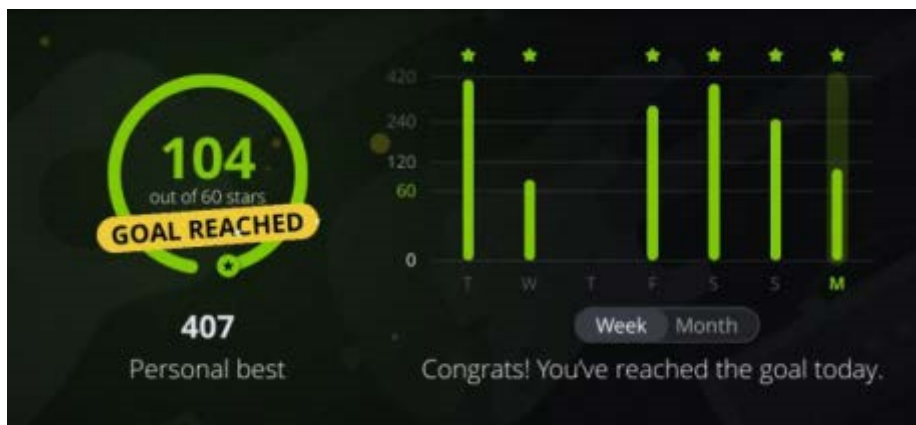


Figure 2 Progress Tracking

The application also largely uses gamification approach to teach music. Besides providing instant feedback, it features weekly challenges that allows users to compete with millions of users to top the leader board. When signed-in using Facebook, users can challenge their own friends by topping their scores.

Yousician is not only for music students or learners but for teachers as well. The application is also aimed to work as learning solutions for music teachers. Yousician also comes with a built-in tuner called "GuitarTuna" which is ranked as the best tuner in the world on both Google Play and App Store. The tuner is renowned for its accuracy, intuitive design and also, it's usability. It is used by guitarist of beginners to the advanced players. There are also features in the application which does not require the learner to possess an instrument at hand; theory practices and ear-training. Yousician offers one free lesson per day whereas unlimited lesson is available with paid subscription: monthly or annually. Guitar was the first

instrument that was introduced on the application when it was first released in 2014. The syllabus of the lesson is displayed as a chart and is divided into three paths where completing each mission will unlock new levels in the path that the user takes.



Figure 3 Unlocking Mission and New Levels

Methodology

A qualitative research approach was used for this study as it is seen as the most suitable approach when exploring individual experiences in a particular circumstance; in this case where the study explores individual learners who use the music learning application as a tool to enhance their music learning process. The complex natures of such situation are bound to emerge various areas of emerging questions. A quantitative approach is not appropriate to address the goal of this study as the study does not aim to test objectives theory, rather to render uncertain outcomes with many possible findings (Creswell, 2013). The qualitative research approach is described further including purposive sampling, semi-structured interview and coinciding data collection and data analysis method. Thematic analysis (Braun & Clarke, 2006) method was used to analyze the data to not only find themes to make sense of the data, but to answer the research question and achieve the aim of the study.

This study intends to explore the role of music learning application among adult music learners of different prior experience with music through exploratory case study. This approach could assist the researcher to explore and understand the role of the music learning application as a tool in enhancing one's music learning and practice. case study is a method used when studying exploratory or descriptive cases where the researcher has only little control over the outcome. An exploratory case study is used in a given situation where there is no definite outcome. According to Yin (2014), case studies are used when questions

such as “how”, “what”, “who” and “why” are being asked. In an exploratory case study, “how” and “what” questions are answered. This type of case study is also suitable to be used when intending to gain an in-depth representation of a social phenomenon. The exploratory case study can be used when exploring presumed cause-and-effect factors that are too complex to be fulfilled by a survey or an experiment.

Data is collected upon an in-depth study on the two categories of learners using the selected music application over a period of one week. The validity of data collected in this study is reinforced through data triangulation. Triangulation of data; the use of multiple data sources allows the researcher to carry out a thorough study and authenticate the findings which in turn increases the credibility of data (Lord, 2017). Data collected from the video/ audio recordings, documentation of data from the journal, and the transcript from the interview would be used for the data triangulation process. The validity of the study can be increased when a theme can be established based on the data obtained from the multiple sources (Creswell, 2013). Hence, the findings for this study is derived from four data collection instruments namely in-depth interview, observation of learner activities on Yousician, reflective journal and field notes.

Selection of Participants

Participants for this study are selected through purposive sampling where the research sample consists of four adult individuals with different prior music experience. The four are divided into two categories of learners where the first is the beginner category; consists of two learners with minimal knowledge in music. The second category is the intermediate category which consists of two other learners with a higher level of experience and knowledge in music. The categories with contrasting criteria are given two participants of each to confirm the findings.

Table 1 Selection of participants

Category	Beginner	Intermediate
Experience in learning music	Minimal to almost no experience in music	Have taken music lessons, is able to play music instruments, is actively involved with music practices
Number of Cases	2	2
Total number of cases	4	

Qualitative Data Analysis

Data analysis is done from the progressing stages of the study from the data collection up to the finding write-ups. This is to ensure that the data collected are organised and structured until the final write-up (Creswell, 2013). The inductive method was used to analyse the data in order for the researcher to work with the collected data until a set of themes are established. Data analysis will be performed based on

thematic analysis method. This analysis method would help to answer all the research questions as this method works as a flexible tool to obtain complex and detail data. This can help to explore the various possible findings to the research questions as the goal of the study is to explore the role of music learning application as a tool to in the learning process of music learners. According to Braun and Clarke (2006), there is a 6-phase guide in applying the thematic analysis method: (1) Getting familiar with the data, (2) Generating codes, (3) Search for themes, (4) Review themes, (5) Defining themes and (6) Producing report.

Results and Discussion

A total of four participants have used Yousician throughout the one-week study. The participants' details are depicted in Table 2.

Table 2 Table of participants

Name	Level of Expertise	Age	Description of Music Experience
B1	Beginner	18	2 years Tabla class; 2-3 months self-learning guitar watching YouTube
B2	Beginner	27	Attempted to learn guitar from friends at the age of 14 for few days
M1	Intermediate	24	Plays drums since age of 12 Learned to play guitar since age 14; have been regularly practicing guitar since 18 years of age; Plays Cajon for a music band
M2	Intermediate	24	Learned to play guitar at the age of 15; Plays Cajon

There were several characteristics of the application which highly supported music learning and practice. Most of the characteristics rely on the gamification features of the application. However, there was one particular characteristic which inhibited music learning and practice. This section provides discussion into the findings on the characteristics of the application that supports and inhibits music learning and practice from the participants' perspective.

UI/UX

The participants claimed that the application had attractive user-interface (UI) and a very user-friendly user-experience (UX). The attractive UI was able to engage learners' attention which directly supports learning and practice. They also mentioned about the UX being user-friendly was making it easy for them to learn and practice music. For instance, Participant B1 expressed that he is satisfied with the overall experience of using the application. He said:

"It was very user-friendly I would say. The colours are very vibrant which makes it more attractive and pleasing to look at. It makes it look more fun. The background colour changes according to the song. The instructions on the app are easy to follow and understand. Quite well made."

Participant B2 also mentioned that he was attracted to using the application because of its interface design and user experience offered. He stated:

“The app looks nice and catchy. For me I had used other apps (not related to music) that didn’t have interactive interface like this one. The vibrant colours in the app was very attractive to me.”

This finding demonstrated that the UI/UX design of the application facilitates music learning and practice.

Instrument Essential

The tuner was seen as a very useful feature of the application which indirectly aided music learning and practice as it is common knowledge that music instruments should be in tune to produce the right output and create the desired sound or music. That is also why this feature is categorised as essential. All participants addressed this feature and found it very useful throughout their study period. Three out of four learners mentioned how the tuner was very easy to use and handy as well. Participant B1 was one of them who has depended on the tuner especially when he is still a beginner learner. He mentioned that he had very little experience learning the guitar which explains why he had used the application to not only learn something as basic as proper way to hold the guitar but to tune the guitar as well.

On the other hand, Participant M1 also mentioned that, besides being easy to use, he found that the tuner was quite accurate. He said:

“The tuner was pretty cool and very handy. Just to tune the guitar whenever the guitar sounded a bit off and you could click the tuner and check the guitar cause tuning the guitar is very important. It was very easy to use and quite accurate as well.”

Tuning a guitar has been a manual task since string instruments were invented. However, an automated guitar tuner is made to not only help musicians to tune the guitar, but to do it accurately leaving out the option of human error. Moreover, it also saves the musician’s time (Kumar et al., 2018). Thus, the tuner feature that comes with the application is directly considered a characteristic that supports music learning and practice as it helps to keep the guitar in tune.

Gamification Feature

Gamification is an approach where game elements or mechanics are added into a learning context to stimulate engagement and a certain desired behaviour. It is not using a game to instruct a certain content, rather to integrate game elements that are considered engaging and holds a potential to facilitate learning

process (Birch, 2013). For instance, some common game mechanics are scores or points, levels, ratings, badges and leader-boards.

Gamification has the potential to motivate learners' (Kapp, 2012). This is in fact directly related to this study where learners felt motivated to keep practicing when completing challenges, obtaining scores and receiving positive prompts from the application; all of which are gamification components in the application. Participants also claimed that they felt that engaged when using certain features of the application. The features were scoring system and instant positive feedback. Participant B1 mentioned how he ends up practising because of the game elements in the application Evidentiary comments for this include:

“So, me being a person who normally plays games in such a way where I choose to perfect the levels, me seeing the levels not perfected, gives me motivation to keep playing the level again and again and again until I get the perfect score which I think definitely influences how I play. So, it gives me much more practice time even though I don't put in my own effort. The app forces me to do it since I want the perfect score.”

As scores are not only used to reward learners but also to provide constant feedback on learners' progress (da Rocha Seixas et al., 2016), the learners find engagement in being rewarded for their progress. Learners' find gamification to ease their learning and practice as well. For instance, another participant, B2 addressed that the game features motivated him and even got him engaged to the application, indirectly promoting practice. He said:

“After trying to play the song the app will show me how I performed using stars. After I played the song and getting performance rated not so good, I was motivated to try again to get more notes correctly. That got me engaged in the app until I spent nearly 2 hours on it. I know for sure it will influence me to practice the guitar more frequently because I do not consider the app as a learning app, it's more like game. The features like the challenges and the star rating system makes it feel like I'm playing a game.”

Gamification makes learning interesting and when a learner finds a task interesting, he/she will very likely be intrinsically motivated to engage (Birch, 2013); this potentially makes the learner feel that whatever it is that he/she is learning to be easy. According to the findings, a feeling of fulfilment is claimed to be felt by the learners when they progress through levels and complete challenges. This echoed the study of da Rocha Seixas et al. (2016) that suggested the higher the level, the greater the sense of accomplishment.

Technical Issues

There was only one particular aspect in the application which all learners found to be obtrusive during their learning and practice; the sound register problem. The application was not able to register sounds that were played from the learners' guitar, which resulted in an inaccurate learning outcome. Participant B1 mentioned:

“If there was such an app where it could see how you place your fingers and differentiate the sounds of an up strum and a down strum then maybe it has the potential to compete with a guitar instructor.”

Participant M2 on the other hand suggested possible interfacing using external mics. He also suggested the option of connecting an interface straight to the guitar as he claims that *“most guitars these days come with a pickup for accuracy”*.

This has caused learners to get frustrated and disengaged, which in turn, could demotivate their intention to learn. It is gathered that the failure in the game mechanics such as the instant feedback feature has the potential to cause disengagement among the learners.

Conclusion

It should also be noted that this study is not without its limitations especially on the selection and size of sample. Due to the qualitative nature of this study, findings from this research could not be generalised to all music players or music learners who have experienced mobile applications such as Yousician.

Nevertheless, this study attempts to spark further research on the development of mobile applications that could enhance music learning in an informal learning environment. It also demonstrated some insights on how music learners would most likely use this application for music learning and practice. Yousician is only one of the examples of mobile-based applications which could be used as a vehicle to bolster the learning experience of music learners. It can be concluded that music learners could actually learn and practice using this application; this application does facilitate learning and the game mechanics definitely promotes motivation and engagement to the learners that use this application for learning.

However, there should be a proper distinction in the provided lessons for learners of different prior experience as the application seemed to expose learners of all experience with the same set of lessons despite giving the learner the option to pick their level of experience in learning the guitar prior to using the application. Moreover, improving the sound register problem would also allow the application to cater a much more wholesome experience for learners when using this application for music learning and practice. Our future goal is to expand this study to explore if other mobile applications with similar features to Yousician has the potential to provide similar learning opportunities to its users.

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Authors' Bio

Tan Yun Yi is currently a Senior Lecturer at Universiti Sains Malaysia. She obtained her Bachelor degree in Digital Media (Hons) from Multimedia University in 2009. She was later awarded the fellowship award to further her postgraduate studies. In 2018, she received her Ph. D in Educational Technology from The University of Hong Kong, Hong Kong. Her area of specialisation includes educational technology, multimedia design, technological creativity and gerontechnology. Her research interest is also driven by her curiosity in creative media and technology, and also how they could be used to enhance learners' learning experiences.

Sinthu Thirumarul is a graduate from Universiti Sains Malaysia. She completed her degree in Bachelor of Fine Arts (Hons) Graphic Communication in 2019. Right after her graduation, she furthered her postgraduate study in Master of Instructional Multimedia which also took place in Universiti Sains Malaysia. She finished her master's degree within one year and graduated in 2020. She is inclined to creative projects involving design which she believes is crucial when it comes to learning and knowledge acquisition.