

**ADULT LEARNERS' MOTIVATION AND
SELF-DETERMINATION TOWARDS
INDEPENDENT PIANO LEARNING
THROUGH MOBILE APPLICATION**

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**CULTURAL CENTRE
UNIVERSITY OF MALAYA
KUALA LUMPUR**

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SELF-DETERMINATION TOWARDS
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DEDICATION

I would like to dedicate this study to my father, Jepson Teoh who cultivated the love of music in me and my mother, Lim Ping Sim who always supported and encouraged me in my music studies aside from believing that education will spur me on in ways I did not imagine.

Also, not forgetting the teachers who inspire me so much in their passion for teaching: Ms Ong Li Li, my long time piano teacher who left an impression on my music education; Ms Faith Lim, who always entertain my yearly visits since I left high school and believed that I have what it takes to be a different kind of teacher; Ms Aileen Khoo, who taught me that there is much more to being *just* a music teacher; and my ex-colleagues from Fairview International School Penang who helped to mould me into becoming the teacher that I am today.

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Adult Learners’ Motivation and Self-Determination Towards Independent
Piano Learning Through Mobile Application

Field of Study: Music Education

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ADULT LEARNERS' MOTIVATION AND SELF-DETERMINATION TOWARDS INDEPENDENT PIANO LEARNING THROUGH MOBILE APPLICATION

ABSTRACT

This study examined the motivating factors and self-determined behaviours of adult learners in independent piano learning through a piano learning app. It employed the narrative inquiry method to gather stories and detailed experiences from the participants through participant interviews, participant journals and self-reflexivity of the researcher. Five working adults from the Klang Valley were recruited to take part in this study and each had a different motivation for piano learning. The unique scenario of this study challenged the adult participants' motivation in piano learning and presented different challenges faced in self-determined learning. The piano learning app also presented different perceptions towards self-directed learning with apps. The findings of the study found that adult motivation for learning is a result of self-actualization and that self-determined learning is challenging for adult learners in terms of human agency. The findings also indicated some success and pitfalls of self-directed learning with apps.

Keywords: motivation, self-determined learning, self-directed learning, mobile learning

ADULT LEARNERS' MOTIVATION AND SELF-DETERMINATION TOWARDS INDEPENDENT PIANO LEARNING THROUGH MOBILE APPLICATION

ABSTRAK

Kajian ini bertujuan mengkaji motivasi and perangai untuk menentukan cara pembelajaran pelajar dewasa untuk belajar main piano secara berdikari melalui aplikasi mobile pembelajaran piano. Kajian ini telah menggunakan cara *narrative inquiry* untuk mengumpulkan cerita dan pengalaman secara teliti daripada peserta kajian melalui temu bual Bersama peserta, jurnal peserta dan reflektiviti pengkaji. Lima orang peserta dewasa dari Lembah Klang telah direkrut untuk menyerta kajian ini dan setiap peserta mempunyai motivasi yang berbeza untuk belajar piano. Keunikan kajian ini telah mencabar motivasi peserta untuk belajar main piano dan melalui cabaran pembelajaran secara heutagogi. Pembelajaran piano melalui aplikasi mobile juga menyampaikan beberapa persepsi terhadap pembelajaran sendiri dengan aplikasi mobile. Keputusan kajian menunjukkan motivasi individu dewasa untuk pembelajaran adalah hasil kesempurnaan sendiri dan heutagogi sebenarnya amat mencabarkan bagi pelajar dewasa dari segi *human agency*. Keputusan kajian juga menandakan kejayaan and kegagalan cara pembelajaran sendiri dengan aplikasi mobile.

Katakunci: motivasi, heutagogi, pembelajaran sendiri, pembelajaran mobil

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CHAPTER 1

INTRODUCTION

1.1 Background

The 21st century is a battle of instant information and advanced technology that it is considered trading material and sign of power. This is evident when news came out about the battle for building 5G technology globally between America and China (Herman, 2019). 5G will be the new form of internet connectivity which promises faster working speed, wider coverage and a more stable connection which allows more devices to be connected simultaneously (Wall, 2018). Hence, it is not surprising that big and powerful nations like America and China are competing against each other. With that kind of potential in mind, the development of the Knowledge Age can be expected as it requires individuals to be knowledge agents whereby collaborative advancement of knowledge takes place, new ideas are formed, shared and improved (Tan, Hung, & Scardamalia, 2006). This event sets the tone for the demand and invention of new technological tools. Hence forth, it will also change the landscape of education which is the focus of this study.

A by-product of fast paced technology has produced the invention of smart mobile devices which operates on applications or more commonly known as ‘apps’. The functions of apps are limitless and highly beneficial in many fields of work or activity such as monitoring health (Bell, 2019) and increase work productivity (Williams & Turner, 2019). However, the purpose of apps has become more relevant through m-learning or mobile learning. Traxler (2005) defined mobile learning as “any educational provision where the sole or dominant technologies are handheld or palmtop devices” (p. 262). Today, mobile learning is available on mobile devices such as the smart mobile phone and it is easily accessible. Education institutions are also utilizing this technology (Open Access Government, 2019; Rogers, 2019) and the possibilities of using it inside or outside the classroom are infinite as more apps are developed for mass use.

Aside that, there are serious game apps to contend with. Linden and Joolingen (2019) defined serious game as “a computer game with the aim of facilitating learning in addition to entertaining users” (p. 16). A quick search using the Android mobile application browser, Google Play Store will provide many options such as *Duolingo* for language acquisition, *Math Tricks* for learning mathematics and *World map geography, capitals, flags, countries* for geographical studies.

The ubiquity of serious game apps allows learning to take place in the comforts of one’s home or living space. The individual learner may not feel the need to consult a qualified teacher frequently but only when necessary during the learning process. This non-formal learning takes place outside of the traditional learning environment and it is highly dependent on the learner’s intention and purpose (The Council of Europe, n.d.).

The 21st century community is no longer conforming to traditional methods of education as learning is not confined to the four walls of a school or university. Organizations like the Organization for Economic Co-operation and Development (OECD)(n.d.) are making efforts to get informal and non-formal learning recognized because it believes that individuals should be recognized for their learning efforts and should be awarded with a document that proves their initiative. It is timely that we should recognise independent learning and self-determined learners.

The internet has offered opportunities and abundances of resources for self-driven music instrument learning. It is now commonplace to find multitudes of paid and free instructional content on the internet for popular instruments like piano and guitar. Jutras (2014) acknowledged that piano students today are different from a generation ago due to these reasons: students have instant access to information via internet, the ability for self-instruction, frequent interaction with the online community and the need for being creative. The traditional way of teaching and learning the piano is now under more scrutiny due to those factors, paving way for more contemporary methods of teaching and

learning the piano. With the advent of serious game apps, piano learning could possibly take place independently by the self-determined learner.

From the brief discussion above, this study intends to explore the motivation and self-determination of adult learners in independent piano learning by using serious game app for piano learning.

1.2 Statement of the problem

Studies on adult music participation are typically found in senior adults. Many of these studies focuses on community music learning (Bayley & Waldron, 2020; Hallam, Creech, McQueen, Varvarigou, & Gaunt, 2016; Roulston, Jutras, & Kim, 2015) and some on private music instruction (Jutras, 2003; Kronish, 2004; Pike, 2001, Taylor, 2012). There are a few studies related to younger adults, specifically those still actively pursuing a career or at the peak of their adult life. It is worthwhile to understand the reasons adults participate in leisure activities such as music because they voluntarily invest their resources and effort in it (Jutras, 2003). Hence, this study aims to focus on this group of adult learners who pursue piano learning willingly.

Further, adult motivation for music learning is also widely researched on older adults. Some of those motivations are the importance of music in the lives of senior adults (Bayley, 2019), the opportunity to interact with others musically (Curran, 2019; Roulston, 2015) and opportunity for musical challenges (Bugos, 2014). However, not much is known about younger adults.

Self-determination has an impact on adult motivation as it influences the learner's behaviour and capabilities to learn more proactively. Self-determined learning research is still new as it was only introduced in the early 2000s (Hase & Kenyon, 2000). The research of self-determined learning approaches and implementation has been conducted in various fields of study including: artificial intelligence (Aguayo, 2019), vocation

education (Putra et al., 2019; Putra et al., 2020), teacher education (Marcut, 2018), journalism education (Narayan, 2018) and coach development (Stoszkowski & Collins, 2017, 2018) and fashion design education (Reddy, 2016). Hence, there leaves a wide gap for self-determined learning in music education.

There is also a need to conduct research on adult learner's response towards different learning strategies and setting based on their unique learning history and styles (Veblen, 2012). As app learning is an ongoing trend, it is emerging as an important mode for music learning. The mobile learning environment is different as it supports a wide range of contexts and life transitions (Chen, 2015). This study will contribute some fresh perspective on music learning with apps as the mobile learning tool. Besides that, studies relating to independent piano learning or autodidactic piano study with integrated technology for adults are few. Most research in piano or keyboard learning revolves around children, teenagers, college or university students and older adults (Mitak, 2012). This situation creates little or few literatures for adult piano studies (Cooper, 2001).

1.3 Purpose of the study

This study focuses on the motivation and self-determination of adult learners' toward independent piano learning through mobile app. The purpose of the research aims: (1) to identify the factors that motivate adults to learn the piano leisurely; (2) to study the challenges of self-determined learning for adult music learners; and (3) to explore the perceptions of adult learners towards self-directed learning with apps.

1.4 Research questions

The following are research questions pertaining to this study:

1. What are the motivating factors for the adult participants to learn piano?
2. What are the challenges faced by the adult participants in self-determined learning?
3. What are the perceptions of self-directed learning with apps?

1.5 Significance of the study

This study will be contributing more insights about working adults who choose to participate in music learning. The background, history and current occupations of the adult learner will lend understanding for the adult learners' decision to participate in music learning.

Besides that, this study will help music educators understand more about the mechanics of self-determined learning in adult music education. Stakeholders of music education will be able to make use of this new knowledge to assist adult music learners in achieving their goals.

The perspectives of adult piano learners towards app learning are important so that there is understanding about the app learning environment from users' perspective. The feedback given by the adult piano learners may assist app developers to create better piano learning apps in the long run.

1.6 Delimitation of study

The following are some delimitations applied to this study:

1. The learning goals for each participant are unique based on their desire or reasons for piano learning.
2. The duration of the study is 10 weeks.

3. Participants are working adults between the ages of 24 and 37 years old in the Klang Valley.
4. The app used for this study is *Simply Piano*, developed by Joy Tunes.

1.7 Definition of terms

For clarity in this study, the following are the theoretical and operational definitions of terminology that are used:

Adult learner. The adult learner can be defined as an individual participating in purposeful learning activities that may come in different categories of learning which are formal learning, informal learning and non-formal learning (The European Commission, 2000).

Motivation. Ryan and Deci (2017) believed that motivation can range from being “controlled to autonomous” whereby an individual can be coerced or self-initiated into an action depending on one’s psychological needs. This study focuses on the intrinsic motivations of the adult participants as they engaged in piano learning voluntarily.

Self-determined learning. Self-determined learning is learner-centred, whereby the learner “determines the learning path, defining learning objectives and outcomes, as well as how that learning will be assessed” (Blaschke, 2018, p. 130). Hase and Kenyon coined the term ‘heutagogy’ to express “self-learning independent of formal teaching” (Parslow, 2010, p. 1). Hase and Kenyon (2000) also described self-determined learning or heutagogy as a way to challenge teacher-centred learning and to advocate ‘knowledge sharing’ as it will become an important skill due to innovative progress and changes in the structure of communities and workplaces.

Self-directed learning. Knowles (1975) described self-directed learning as a process whereby learners are in-charge and independent in determining their learning needs. The learners can articulate their learning goals, recognize the necessary learning resources, select and apply the suitable strategies for learning and assessing the outcomes (Knowles, 1975).

Mobile Applications (Apps). Flora, Wang, and Chande (2014) defined mobile applications as “compact programs developed to work on smart phones, tablets and feature phones” (p. 21). Similarly, the IBM Knowledge Center (n.d.) also defined apps as a program that is designed for small, wireless devices like smartphones or tablets.

1.8 Conclusion

This chapter briefly described the basis of this study about adult learner’s self-determination in independent piano learning through apps. Subsequent chapters will elaborate further on related literature and the methodology. This study concludes with findings and discussion.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This chapter includes a review of literature relevant to learning desire in adults, the self-determined learning, as well as mobile learning technology. This review is organized into four main sections: (1) adult music participation; (2) adult education; (3) self-determined learning; and (4) mobile application. The review presented aims to provide the framework and rationale for the present study.

2.2 Adult music participation

Adults typically have the freedom to participate in activities outside of their work schedule. Normally, their leisure time is spent on a new hobby or activity that allows them to escape routine and music can be that outlet. Music participation can take place in various settings, whether formally or informally, at the confines of one's home or at a music learning institution and sometimes at a community centre. However, there are adult music learners who take music learning more seriously by showing high levels of commitment and skill acquisition (Dattilo, Ewert, & Dattilo, 2012). Hence, music participation may appear to be more than just a leisure pursuit.

Community music participation is much researched about and some researchers make it their commitment to spend time on it as it concerns lifelong learning in music. Bayley and Waldron (2020) studied extensively on the convergence of online and offline contexts of one music community in Ireland. Their research included getting perspectives from the stakeholders (teachers and students) and observing the community's activities. Hallam, Creech, Varvarigou, and McQueen (2012a, 2012b) also studied the reason adults involve in community music, the challenges they face in music making and the perceived

benefits of music participation. The study on adult music participation is important because the needs of adults requires attention so that music educators and other service providers can dedicate effort in “fulfilling the music *learning* needs and interests of adults” (Myers, 2012, p. 1).

2.2.1 Adult music motivation

The reasons adult learners have the desire to take part in musical learning are individually unique. The life experiences of adults are “unpredictable, circuitous paths” (Blanton, 2016, p. 17) due to differences in individuality and preference towards involvement in music. Nazareth (1999) likens adult music education to “lifelong music education” (p.17) whereby intentional behaviour and continual participation in music learning takes place. Unlike children, adults have the autonomy in making decisions. Following that, adults who decide to be intentionally involved in music learning for a substantial duration is not a whimsical act.

When Bowles (1991) carried a survey among prospective adults in music education, he found that positive respondents are likely to learn music due to several reasons: (1) they had prior experience in musical learning and participation; and (2) they have studied music informally. Roulston, Jutras and Kim (2015) found similar and other results in their study whereby the adults participate in instrumental learning: (1) strong influence of prior learning experiences from youth; (2) recommit in learning due to incomplete musical goals or long-term ambitions; and (3) triggered by specific events.

Dabback (2006) found that older adults engaging in communal musical making benefited by establishing new relationships via friendships with other individuals. This involvement has helped them “construct new identities and new purposes in life” (Dabback, 2006, p. vii). In addition to social benefits, older adults are also found to receive cognitive benefits (e.g. increased levels of alertness and memory improvement),

emotional and health benefits (e.g. overcoming depression) and physical health benefits (e.g. improved levels of breathing) (Hallam, Creech, Varvarigou, & McQueen, 2012b).

Studies on instrumental studies shows more specific motivation factors expressed by the adult learners. Wristen (2006) found that adult piano learners are motivated to increase their musical ability or knowledge, influenced by instructor, group learning environment and music itself. Similarly, Taylor and Hallam (2008) also found that adults love for music, emotional significance, family links, achievement and empowerment, self-confidence, satisfaction being the motivations of adult keyboard learning.

It must be pointed out that many of the mentioned studies mainly concerns older age group of at least 40 years old. The literatures on younger adults who are of the working age or at the peak of their adult life and far from semi-retirement or permanent retirement age are very few.

2.3 Adult education

Adult education is not an entirely new endeavour in research or practical use. The art of adult education was lost and forbidden ever since monastic schools labelled it as “pagan” in the seventh century and it gave way to child-like treatment and varying degrees of control towards novice learners (Knowles, 1973). There is simply too much emphasis on the education of children or commonly known as pedagogy, especially in the 20th century. There is renewed interest in adult education and a growing repertoire of literature about it. UNESCO Institute of Statistics (2011) defines adult education as an activity whereby an adult makes effort to improve existing skills and competencies, develop new ones and increase knowledge in a specific field or completely new field of interest.

It is important to note how important learner-centred approach is in adult education. An exploration by Tan (2018) on technology in adult education implied that

“participatory approach of learning is gaining traction” (p. 934) and it is imminent that more change and development will take place.

2.3.1 Intrinsic motivation

Adults who choose to participate in learning activities to further educate themselves are worthy of study as they make conscious choices in voluntarily learning something new or acquiring new knowledge. According to Maslow’s theory on human motivation, once an individual’s basic needs are satisfied such as physiological needs and safety needs, they may be motivated or inspired to seek other pursuits that will further satisfy other area of needs, for that “man is a perpetually wanting animal” (Maslow, 1943, p. 370). Human needs can never be full satisfied in that manner. Eventually, with all the basic needs satisfied, humans will attempt to achieve the desire for self-fulfilment, or what Maslow labels as self-actualization. That desire will be a prompt of motivation for individual pursuits. Robinson’s suggestion concurs with that kind of motivation as she felt that intrinsic motivation was a characteristic of learners with high sense of personal satisfaction and they were likely to persist in learning for the purpose of learning (Robinson, 1996). Hayes (1989) would concur with that by stating that individual motivation levels depends on the balancing act between needs, beliefs, education and experience.

Ryan and Deci’s self-determination theory (SDT) also explains that motivated individuals grow and experience change when “competence, connection and autonomy are fulfilled” for that individual (Cherry, 2019, para. 4). Deci and Ryan (2008) explained those needs as the following: (1) the need for autonomy which is being able to control one’s life and their own behaviour; (2) the need for competence which is to feel that one has acquired, constructed and built their skills and progressively master those tasks that are significant to them; and (3) the need for relatedness (also known as connection) which

is to feel that one belongs to a network of other individuals. These needs are necessary to encourage the necessary motivations in learning. Ryan and Deci (2017) theorised that there are three kinds of motivations which are autonomy motivation, controlled motivation and impersonal motivation. In relation to the current study, autonomy motivation shows the individual's true interests in the task that they are doing as opposed to controlled motivation shows the individual's interests only when they are instructed or given a reward. Impersonal motivation by an individual demonstrate very little interest and unwillingness to carry out tasks.

As a researcher for this study, there is a need to understand that intrinsic motivation is not just satisfying learning needs, but it is also something that explores the perspective and views towards self that can help a person grow. The willingness to study will show higher engagement in music learning and practices (Oie et al., 2019).

2.3.2 Andragogy

There are number of adult learning theories and one of them sprung into prominence. Knowles (1980) initially defined andragogy as “the art and science of helping adults learn” (p. 43). However, further study and feedback to Knowles helped him make clearer assumptions of mature learners as such: (1) their self-concept moves from one of being dependent personality toward being a self-directed human being; (2) they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning; (3) their readiness to learn become oriented increasingly to the developmental tasks of their social roles; and (4) their time perspective changes from one of the postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centeredness to one of performance-centeredness (Knowles, 1980, pp. 44-45). Over a span of time, he has also added two

more assumptions which are the learners' need to know why they are learning and internal motivation rather than external (Knowles, Holton III, & Swanson, 2015).

Though andragogy generally benefits the individual learner, it is also important to society that adult learners take it upon themselves to further educate or improved one's own self that incur changes in the individual's "knowledge, skills attitudes, behaviour, and awareness" (Tough, 1971, p. 32). Within the context of independent piano learning, andragogy can further enhance our present understanding on: (1) adult learners taking action on their desires for learning; (2) adult learners' ability for self-direction; (3) adult learners using their prior knowledge to enhance or nurture more appreciation towards music education, especially piano studies; (4) adult learners' application of knowledge towards their work or personal goal; (5) adult learners' progress to achieve those goals; and (6) adult learners' intrinsic motivation that drives them in this whole learning process.

2.3.3 Self-directed learning

One of Knowles' (1980) assumption on andragogy branched out into another adult learning model that helped defined its place in adult education which is the learner's ability to be self-directed (Merriam, 2001). Knowles (1975) made further comparisons of traditional pedagogy and self-directed learning in his book, *Self-Directed Learning: A Guide for Learners and Teachers* by laying out that self-directed learners (1) use their prior experience as a rich resource for learning; (2) develop learning from life tasks and problems; (3) learn from tasks or problems; and (4) motivated internally and with curiosity.

The self-directed learning approach is also lauded by other authors with various interpretations depending on their philosophical inclinations such as: (1) the learner's capacity to be self-directed as a goal; (2) transformational learning is fostered; (3) emancipatory learning and action are promoted; (4) varied models of process; and (5)

learner type and levels of self-directedness are unique and associated with other variables (Merriam, 2001). In all self-directedness of learning, teachers or facilitators are still responsible in nurturing this type of learning but know that there are times where learners may need assistance (Knowles, 1980).

There is a lot to draw from self-directed learning studies on older adults and their participation in learning. Roberson Jr. (2005) investigated leisure and learning in older adults and found that self-directed learning is highly engaging as the adults found enjoyment, excitement and passion in their learning endeavours of various subject knowledge and skill. Self-directed learning approaches were also attempted in the development of adult piano/organ class programmes for seniors (Curran, 2019) whereby the adult learners were encouraged to take more responsibility and being independent in their learning after being taught the basic concepts, learning strategies and techniques for musical activities. Besides that, it has also helped adult learners attain self-fulfilment when they engage in music supported by learning, motivation and musical identity (Taylor, 2010). Thornton (2010) investigated three musically engaged adults and also found that self-directed learning made the adults significantly involved “in their learning, transformation, and emancipatory action” (p.107) so that their goals were met through their musical activities. Self-directed learning has its importance in music learning as some adults would like to engage in informal learning settings as it is within their control of when, where and how they would learn.

2.4 Self-determined learning

Student-centred learning theories are gaining prominence and this is due to students wanting to learn more and be more involved in their learning process (Halupa, 2017). This change in student behaviour is notable and gained the attention of adult learning theorists in the form of self-determined learning approaches. Heutagogy is a form of self-

determined learning and it is said to be an extension of andragogy (Blaschke, 2012) and just like andragogy before, it is being challenged and tested for its approach to teaching and learning. Hase and Kenyon (2000) felt that the biggest factor contributing to this shift from teacher-centred to student centred learning is when Argyris and Schon (1996) suggested the double loop learning concept. Double loop learning is a learning style where individuals are taught to be more involved and focused on “their own assumptions and beliefs” (Cartwright, 2002, p. 68). Unlike single loop learning whereby the learner focuses on problem solving, double loop learning challenges learners to question their personal perspectives and beliefs (Reflection4Learning, n.d.). Adult learners will take a step further in self-directed learning as they may start to show more curiosity towards their learning experience.

2.4.1 Principles of heutagogy

The principles of heutagogy are to be based on: (1) “learner-cantered and learner-determined” approach whereby the learner is self-motivated and holds control in he or she will learn and be assessed; (2) learner’s capability to use skills in familiar or unfamiliar situations; (3) learners’ ability to self-reflect and understand the process of the learning (metacognition); (4) “double-loop learning”; and (5) nonlinear learning and teaching, whereby the learner determines the entire learning journey without the teacher’s managing and planning the learning (Blaschke & Hase, 2016, p. 28).

From this perspective, heutagogy brings andragogy to another level of learner autonomy in their learning goals and learning approaches. It may also seem more practical in the 21st century as the advancement of technology enables the curious learner to explore more than what an individual educator may offer. The vastness of the internet and the increase of digital tools will not only benefit economies but also the spread of knowledge and information. Stoszkowski and Collins (2017) study on coach development has shown that the use of online blogs has benefited the novice coaches. A study on the nature of

social media interactions among college students also acknowledged the potential of social media for self-determined learning (Nadelson et al., 2017).

2.4.2 Digital tools in heutagogy

Heutagogy learning approaches are more relevant in the internet age. Web 2.0 allowed (1) content creation as an individual or group; (2) content discovery or sharing as an individual or group; (3) knowledge and information aggregation; and (4) connectivity and social rapport (Blaschke, 2013). Generally, Web 2.0 is emphasized on “user-generated content, usability and interoperability for end users” (Sharma, n.d.) whereby apps and websites like Facebook, Twitter and YouTube are the typical tools that can be found. However, Web 2.0 has come a long way from that and has slowly expanded into Web 3.0. This change was predicted and recognized by Cochrane, Antonczak, Gordon, Sissons and Withell (2012) when they proposed a new mobile social media embedded heutagogical framework for a post Web 2.0 society. The ubiquitous quality of Web 3.0 is one of the key characteristics and they can be found in our smart devices (Comben, 2018). This brings heutagogy to a new level and more should be studied about it as the digital environments have proven to be strength of heutagogy (Agonacs & Matos, 2019).

2.5 Mobile applications (Apps)

Mobile applications (apps) are conveniently available to the masses as many apps are open source and free to use. The Malaysian Communications and Multimedia Commission (MCMC) conducted a survey on the usage of hand phones in 2018 and has indicated the increase of smartphone usage from 75.9% to 78% (Malaysian Communications and Multimedia Commission, 2018). The increase use of smartphones may indicate that more apps are also being used.

2.5.1 Apps for learning

Due to increased general use of smart devices, apps have also found its place in learning settings. Learning apps make learning ubiquitous as you can use it anywhere and anytime. It is now commonplace to find that learning apps are used in pre-school, primary, secondary, tertiary institutions and also beyond formal learning settings. School teachers are using learning apps to support teaching and learning of core knowledge subjects such as language (Finardi, Leao, & Amorim, 2016), mathematics (Chang & Yang, 2016) and science (Beach & O'Brien, 2015). Furthermore, learning apps are also used in self-regulated learning (Kondo et al., 2012; Sha, Looi, Chen, & Zhang, 2011; Shih, Chen, Chang, & Kao, 2010) to increase learner engagement.

Serious games, gamification or otherwise known as game-based learning is also getting traction in a little over the last 10 years. Serious games are being pushed to the forefront by educators, advocacy groups and entertainment game developers because it is enjoyable and could communicate an idea (Bergeron, 2006). Those characteristics are very important for educators as they struggle to help their students understand learning content. Kapp (2012) defined gamification as “using game-based mechanics, aesthetics and game thinking” (p. 10) to promote individual engagement, stimulate response, advocate scholarship and problem-solving. In that respect, it should be fairly, if not very enjoyable for the learner to engage in this form of learning as they get to play and learn simultaneously.

The characteristics of game-based learning apps are: (1) easy to navigate and encourages playful environment for learning; (2) arranged in small learning chunks so that learners' attention is not challenged for long periods of time; and (3) easily available to the learner, regardless of the situation or locality of the learner (Trifonova, 2003). The gaming component is especially motivating in the apps as it has shown to increase learner motivation (Bartel & Hagel, 2014; Lenz, Stehling, Haberstroh, & Isenhardt, 2018; Su &

Cheng, 2014). The apps can also be used in non-academic situations such as introducing rules and regulations. Welbers et al. (2019) designed a gamified app for new undergraduate students at a Dutch university to learn about important information such as campus rules and exam regulations.

2.5.2 Apps for music education

Music education apps are also developed for various types of learners, ages and also functions. Some apps are designed for assisting music learning: music practice (Franzier-Roberts & Peoples, 2019), aural learning (Chen, 2015) and music listening (Cho, Baek, & Choe, 2019). Apps for instrumental study are also commercially available such as the piano (e.g. *Simply Piano*, *Yousician*, *flowkey*) and guitar (e.g. *Coach Guitar*). Studies focused on independent music learning apps or apps for instrumental or vocal learning are few. Most of these studies are researcher-designed apps such as vocal (Lin, Anderson, Hamzeen, & Lui, 2014), guitar (Ayala, 2018), mobile music instrument (Lee & Freeman, 2013). There is a lack of research on the commercial music learning apps to explore its relevance and reliability. Only reviews are available on some popular apps like *Simply Piano* (Campbell, 2017) and *Yousician* (“Bass Guitar”, 2016). Hence, this study would like to gain further insight on these learning apps that appear successful in music education.

2.6 Conclusion

The body of literature presented for this study has shown that there is still much to know about the involvement of adult music motivation, the self-directedness of adult music learners, self-determined learning and music learning apps.

CHAPTER 3

METHODOLOGY

3.1 Overview

The purpose of this study examines the motivation of adult learner and its effect on the self-determined learning. The ancillary purpose is to collect the perceptions of the adult learners towards self-directed learning with apps.

This chapter aims to provide a detail description of the research methodology that guided this study. The outline of the chapter is organised as follows: (1) research method; (2) participants sampling; (3) research setting; (4) participant details and learning settings; (5) data collection procedure; and (6) data analysis procedure. The chapter discusses the research methodology employed to address the following research questions:

1. What are the motivating factors for the adult participants to learn piano?
2. What are the challenges faced by the adult participants in self-determined learning?
3. What are the perceptions of self-directed learning with apps?

3.2 Research method

When one considers a serious investigation about a specific subject matter, they would explore their options on research strategies or methods of solving problems or finding truths. That person might consider him- or herself as a researcher of sorts as they set out to look for answers. Research methods are the courses of action to carry out research which entails general premises to specific approaches for data collection, analysis and interpretation (Creswell & Creswell, 2018). A researcher may study different strategies and decide upon the methods that he or she will use to find the answers they are looking for.

Choosing a research method is important for a researcher as there are many instruments or tools that are used during the research process. The tools are instruments for collecting applicable data (Denscombe, 2014). It is no simple matter in choosing a research method as there are so many detailed records and published works of scholars who have spent their time in personal study and contributing to the body of knowledge known to the world.

There are a few factors or ways that can help one decide their research method. Cohen, Manion, and Morrison (2018) stated that the research method will depend on the types of questions being presented, the motivation of the research, the essence of the research, “ontologies and epistemologies which underpin them” (p. 177).

3.2.1 Research design

Based on the research questions for this study and the considerations for research methods, the qualitative research method was chosen to guide this research. Qualitative research is “an inquiry process of understanding based on a distinct methodological approach to inquiry that explores a social or human problem” (Creswell & Poth, 2018, p. 506). A probe of the natural that is occurring around us and it should be specific environments that are being selected for the investigation.

The nature of this study investigates the social construct of how adult learners make meaning of their desire and self-determination through independent piano study. Quantitative methods would be unsuitable for this study as it is dependent on numerical data.

As everyone is unique in their experience and opinion, the case study approach was perused for this research. It was used to address specific questions which require descriptive answers and the researcher had very minimal control over the phenomena being studied (Yin, 2003).

3.3 Participant sampling

Creswell and Creswell (2018) describe the research sampling as having the following considered: the population, sampling design, types of sampling, stratification, sample size determination and power analysis. A similar take on research sampling by Cohen, Manion and Morrison (2018) also stated some key factors to consider are the size of sample, strength of statistics, generalization and the specification of the sample, accessibility, the approach to sampling and the type of research being carried out. Sampling technique, sampling size, the targeted population and access to sample was paramount for this study as the nature of qualitative case studies are precise.

There are two main sampling techniques which are probability and non-probability sampling. The former technique is focused on providing equal opportunity to every group in a population whereas non-probability is focused on smaller samples (Taherdoost, 2016). Non-probability purposeful sampling is information rich thus allowing the researcher to seek deeper understanding of a subject matter and more focused on the research study (Patton, 2015). For this study, purposive convenience sampling was employed. The use of purposive sampling was significant for this study as individuals who were keenly interested in learning the piano were able to offer substantial information and perspective on the learning experience. Aside from that, a convenience sampling approach was also considered whereby the researcher was able to derive study participants from a personal network where in the study could likely happen (Denzin & Lincoln, 2018).

To further enhance data analysis and a higher probability in generalization, a multiple-case study design was employed in this study to look for cross-case patterns and themes (Mills, Eurepos, & Wiebe, 2010). There is no decisive number of case studies that should be used but it should be sufficient to provide suitable generalization of the subject matter (Mills, Eurepos, & Wiebe, 2010). Ultimately the goal of having a multiple-case

design is to offer insight on speculative ideas or principles (Yin, 2018). In this manner, the multiple-case study design considered the varied backgrounds of study participants but similar in the intention for pursuing piano learning.

For this study, recruitment of participants through personal connections took place over social media and messaging app services like Facebook and WhatsApp. Many connections accumulated over the years from high school, university and previous workplaces were reached out. These connections were also asked to assist in sharing this information to reach more people. This method has proven fruitful as 6 participants were recruited at the start of the study. However, one of them dropped out naturally due to constraints which will be discussed later in the study.

3.3.1 Sample criteria

Considering the purposive convenience sampling method used, participant sampling criteria defines the kind of data that the researcher will obtain at the end of the study. To navigate the vast population available to the researcher, the following criteria were taken into consideration for selecting participants and has become the delimitation of the study:

Population group and location. The populations identified for this study are working adults residing in the Klang Valley. This area is convenient and in the close vicinity of the researcher. Whenever appropriate, the researcher could meet and communicate with the participants in person.

Age range. Based on the report by Department of Statistics Malaysia (2019), the working age population is from 15 to 64 years old. Considering that the age range is too wide for this study, a few more sub-characteristics are used to further delineate this population group.

Tech-savvy. The targeted group must be a group of individuals that have experienced the peak of digitization and advancement of technology. In early year 2000, the internet exploded massively where approximately 304 million people had access to the internet at a global scale (Ryan & Jones, 2009). The age group born in or after year 1982 have great interest and skilled in new technologies (Howe & Strauss, 2000) and known as Generation Y or Millennials. Millennials are very tech savvy as consumers and workers. They demand change and are capable of learning new technologies in a short time, if not all the time (Smith, 2017). Today, the millennials are approximately age 19 to 37 years old whereby they are born in year 1982 to 2000 (Martin, 2019).

Education background. The average age of an individual having graduated with at least a diploma education is at the minimum age of 20 years old (“A Glance At”, 2015). Hence, the age group targeted for this study is between the ages of 24 to 37 years old.

Income status. The participants should have disposable income which means they are able to spend on non-essential items or activities after having spent on priority expenditures like food, loan and tax (Sutherland & Canwell, 2004). This means that the targeted working adult population would have the means to spend a portion of their net income to pursue interests outside of their typical activities like drawing, dancing and hiking. This condition would also fit Maslow’s theory on the hierarchy of needs whereby physiological needs, safety needs, belonging and love needs, esteem needs and self-actualization are met and achieved (McLeod, 2018).

Interest. Participants should have the innate desire to learn the piano but for reasons unknown, they were unable to pursue their desire or were unable to complete their piano

study in the past. This study will provide the opportunity and experience that they so wish to attempt.

Based on the above criteria, the six participants recruited for this study were found suitable.

3.4 Research setting

One of the key elements of qualitative research is that it is conducted in a natural setting. This type of setting allows participants to experience the phenomena or situation pertaining to the study which allow the researcher to obtain detailed information and conduct close observation (Creswell & Creswell, 2018, p. 297). The researcher interacts with the participants directly in an environment comfortable for the participants. Hence, this study took at respective participants' home or living quarters where they can spend their leisure time learning the piano independently. Home is also where the participants have full access to a stable internet connection. Internet connection is necessary for this study as the participants engaged in piano learning through their personal mobile device.

For this study, the researcher surveyed an array of commercially available apps for piano learning in the common app platforms of Google's Play Store and Apple's App Store. Due to common consumer use of these platforms in Malaysia, *Piano by Yousician*, *flowkey* and *Simply Piano* were chosen for closer investigation. These apps express the same goals of offering an all-in-one piano learning experience for users on their smart mobile devices. The individual app aesthetics are uniquely developed to appear attractive for the mass market. In terms of app content, they are very similar in terms of course content which includes an introduction to the piano, note reading, chords, the use of popular tunes for course learning and exercises. In terms of rhythm study, it is not explicitly offered in *Piano by Yousician* but ear training is available. Besides the course content, the apps usually have a section offering a catalogue of popular tunes but it may be offered according to the learner's completion of app courses or the level of difficulty

is displayed on the chosen song. The apps do also offer a section of piano playing challenges except *flowkey*. Generally, the apps do not differ much in terms of learning content with some exceptions.

For apps to create such quality course content, a commitment of investment would also be required. A look into the subscription plans for the apps show a diverse range of prices and affordability as shown in Figure 3.1.

Piano Learning App	Android Price	iOS Price
<i>Simply Piano</i>	7.49USD per month (12 months subscription which include 7-day free trial) 9.99USD per month (6 months) 14.00USD per month (3 months)	RM16.65 per month (1-year subscription) RM24.98 per month (6-month subscription) RM33.30 per month (3-month subscription) Family available (up to 5 users per subscription)
<i>flowkey</i>	RM38.33 per month (12-month subscription including 7-day free trial) RM54.16 per month (6-month subscription) RM81.99 per month (1-month subscription)	RM41.65 per month (12-month subscription) RM53.31 per month (6-month subscription) RM82.90 per month (1-month subscription)
<i>Piano by Yousician</i>	RM59.99 per month (1 month subscription which includes 7-day free trial)	RM30.99 per month (12-months subscription) RM40.99 per month (3-months subscription) RM59.90 per month (1-month subscription)

Figure 3.1: App price comparison across Android and iOS platform

Considering the duration of study and the number of adult participants involved, *Simply Piano* was chosen as the representative piano learning app as it allowed the researcher to monitor the participants learning progress over the iOS platform in addition

to subscribing the family plan where five different users may use the same account but having individual profiles. Furthermore, a subscription on the iOS platform is still accessible on the Android device. An additional subscription was also purchased to accommodate the 6th participant. Besides that, the app is also more interactive and colourful making it the most attractive looking learning app among the others. To ensure that the participants have equal opportunity and experience, they were provided a suitable piano keyboard to whom is necessary in addition to getting the premium subscription of *Simply Piano*.

Aside that, the researcher played the role of teacher-facilitator and participated actively whenever necessary. The teacher-facilitator role is to promote learning while providing assistance to the participant's learning process.

3.5 Participant details and their learning settings

The following is a description of participants backgrounds based on the participant recruitment criteria and the settings for their independent learning to take place. The participants are described anonymously for privacy purposes: (1) Leonard; (2) Jasmine; (3) Jane; (4) Aileen; (5) Sandy; and (6) Daniel. Figure 3.2 also shows a summary of the participants and relevant details.

3.5.1 Leonard

Leonard was recruited through Facebook via a mutual connection who saw the recruitment post. The mutual connection is a piano teacher who is aware that Leonard was intentionally pursuing piano learning. Hence, she connected Leonard to this study. Leonard is 28 years old and works as an insurance agent. He resides in Kepong and frequently travels within the Klang Valley for his job. He holds a bachelor's degree and considers himself financially stable to pursue activities that contribute to his personal

development. Upon first visitation and interview at Leonard's residence, it is observed that he owns many tech devices such as iPad, PC and dedicated video game set. It is also observed that he owns an acoustic guitar and a Korg digital piano. All devices and instruments were placed in his bedroom.

3.5.2 Jasmine

Jasmine is 28 years old and resides in Kepong with her family. She holds a Diploma in Fine Arts as well as Diploma in Montessori education. She is an art teacher at an international school in the Klang Valley and has a work experience of more than 4 years. She learned to play the piano at around the age of 7 and took several graded piano exams. However, she discontinued the graded exams around the age of 18. She considers herself tech-savvy as she uses technology in her work and class instruction. Jasmine was provided a loaned 88-key Korg digital piano and it was placed outside her bedroom due to space constraints.

3.5.3 Jane

Jane is a high school acquaintance recruited through WhatsApp. She is 29 years old and resides in Klang. She holds a diploma and works as an accounts executive. She attended organ classes at Yamaha as a young girl but the learning did not last long as she was not provided the instrument to learn at home and she faced anxiety during exams. Jane is tech savvy as she and her brother frequently hold discussions about the latest tech devices. She has also owned many smart mobile phones. Jane was provided a loaned 76-key Yamaha digital piano and it was placed in her bedroom.

3.5.4 Aileen

Aileen is 31 years old and lives in Cheras. She holds a master's degree and works as a Mandarin Language teacher at an international school. She learned to play the *liuqin* when she was in secondary school where they had a Chinese orchestra. At university, she also took part in the Chinese orchestra, playing the *liuqin* to continue her interest in music. She considers herself quite tech savvy as she likes to learn about using technology for work and recreational purpose. She took interest in this study after she saw the recruitment announcement on Facebook. She contacted the researcher directly to inquire further. Aileen was provided an 88-key digital piano which was placed in her study room. She used her Android mobile device at the beginning and at the end of this study. However, she switched to a loaned iPad provided by her workplace mid-way through the study.

3.5.5 Sandy

Sandy is a Form 6 acquaintance and she was recruited through WhatsApp. She holds a bachelor's degree and works as a human resource executive for more than 4 years. She resides in Klang with her husband and family. When she was around the age of 5 to 6 years old, her aunt who was a Yamaha piano instructor, insisted that she took up piano lessons so that Sandy can fall back on her musical knowledge as a potential future career. Sandy owns an acoustic Yamaha upright piano and it situated in her living room.

3.5.6 Daniel

Daniel is a high school acquaintance and he was recruited through a prior social gathering with high school friends. He demonstrated interest in learning a musical instrument and was intrigued by app learning. He holds a bachelor's degree and work as a regional sales executive. He is well versed in technology related discussions. Daniel has an acoustic

piano at his Klang home but he was provided a 66-key keyboard after the acoustic piano was found to be out of tuned.

Participant	Leonard	Jasmine	Jane	Aileen	Sandy	Daniel
Age	28	28	29	31	29	29
Location	Kepong	Kepong	Klang	Cheras	Klang	Klang
Relationship	Mutual acquaintance	Ex-colleague	High school acquaintance	Ex-colleague	High school acquaintance	High school acquaintance
Highest Academic Qualification	Bachelor's degree	Diploma	Diploma	Master's degree	Bachelor's degree	Bachelor's degree
Occupation	Insurance agent	Art teacher	Accounts executive	Mandarin teacher	Human resource executive	Regional sales executive
Mobile Device	iPad	iPad	iPad	iPad and Android	Android	iPhone
Sound Detection	USB adaptor connection	In-built microphone	USB adaptor connection	In-built microphone	In-built microphone	In-built microphone
Keyboard type	88-key Korg digital piano	88-key Korg digital piano	76-key Yamaha digital piano	88-key generic digital piano	Yamaha acoustic piano	66-key generic keyboard

Figure 3.2: Demographic details of participants and equipment

3.6 Data collection procedure

The narrative inquiry is employed as the main tool for this research. It is a form of “storytelling involving characters with both personal and social stories” (Webster & Mertova, 2007, p. 13). It provides context to the experience by study subjects through the manner of narrative (Webster & Mertova, 2007). The participants informed the researcher about their past, present and possible future experiences with self-

determination and musical learning. Narrative inquiry helped the researcher frame a better idea of those events by having the participants inform their experiences as they go along the research duration. The researcher also attempted to capture the emotions and perspectives of the participants through this inquiry.

To create the narrative data for this study, three strategies were used to collect the data which are interviews with the participants, participant's journal on their learning experience and self-reflexivity by the researcher. Some supplementary methods were used: video evidence and text messaging via WhatsApp. Three-Interview Series recommended by Seidman (2006) was used as a guide to procure each of the participants' narrative. His suggestion states that this model for three separate interviews has a good amount of depth to learn more about research participants' behaviour, especially when they are immersed in the context of their own lives and of others around them (Seidman, 2006). Each interview has its own purposes whereby the first interview is about the "focused life history" (p. 17) of the participant, the second interview is about "the details of experience" (p. 18) of the participant during the research period and the third interview is about "reflection on the meaning" (p. 18) of the research experience (Seidman, 2006). For this study, the first interview revealed the participants' history on music education, family background and the motivations for piano learning. The second interview disclosed the participants' challenges with self-determined learning whereas the third interview explored the participants' perception towards self-directed learning with mobile apps. These interviews took place before the research, during the research and after the research in the span of 10 weeks.

Participants' journal assisted in corresponding with the interview data by including a summary of the learning sessions (dates, learning duration and achievement level) and learning reflections. The participants wrote their reflections whenever appropriate, e.g. daily or weekly. Participants were encouraged to reflect on their

emotions, experience or other relevant information pertaining to their independent piano learning experience. This journal was treated as a form of diary or intensive longitudinal method whereby repeated entries of data will allow the researcher to establish a pattern of experience (Bolger & Laurenceau, 2013). This ten-week long study provided an appropriate duration for the participants to attempt independent piano learning and also established some form of consistency depending on their self-determination.

The researcher's self-reflexivity adds another perspective to the narrative data of this research. It is an act of constant self-reflection and criticism of oneself throughout the course of the study (Denzin & Lincoln, 2018). Even as the researcher prepared the study, self-reflection took place when considering the subject matter and it demonstrated the importance of the research to the researcher in discovering new knowledge or facts. Hence, it would be beneficial to the data analysis process (Patton, 2015). The researcher's ability to reflect on past experiences and relate its interpretation to the current study (Creswell & Creswell, 2018) should also be drawn out clearly to create a streamlined narrative. For this study, the researcher derived from personal experience in teaching general music integrated with educational technology to build and add on knowledge regarding the subject matter. Reflexivity took place by writing down notes during the study and it contained data such as interactions with participants and opinions about the study progress.

3.7 Data analysis procedure

The data collection tools employed for this study, Three-Interview Series and the participants' reflection journal were triangulated with the researcher's reflexivity notes to analyze data. Triangulation enables the researcher to study the same phenomenon from the use of different data sources (Denzin & Lincoln, 2018). It is also one of the strategies used to ascertain data consistency and reliability (Merriam & Tisdell, 2015). Through this

same manner, it assisted the researcher in detecting a theme or view from varieties of data (Creswell & Poth, 2018). Those themes or views were further developed into codes that helped the researcher further understand about related concepts important for a study. This is a useful process for the researcher as data are distributed into appropriate and suitable sub-groups which are then “[examined], [compared], [conceptualized] and [categorized]” (Cohen, Manion, & Morrison, 2018, p. 668). The study research questions were a good guide to generate the themes and codes from the triangulated data and assisted the researcher in staying focused on the study topic.

3.8 Conclusion

This chapter has presented the methodology of this study. This qualitative case study generated a wealth of data from the interviews with the study participants, journal entries from the participants and self-reflexive notes from the researcher. These data were triangulated to ensure reliability and credibility of the study. Further, it was also used to generate narrative data from themes and codes.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 Overview

This chapter presents the data analysis from the interviews, journals, WhatsApp communication and additional video evidence. These findings are accompanied with discussions and guided by the following research questions.

1. What are the motivating factors for the adult participants to learn piano?
2. What are the challenges faced by the adult participants in self-determined learning?
3. What are the perceptions of self-directed learning with apps?

4.2 Findings of the study

This section discusses the findings of the study and organised accordingly: (1) motivating factors for piano learning in adults; (2) challenges in self-determined learning; and (3) perceptions of self-directed learning with apps.

4.2.1 The motivating factors for piano learning in adults

This study has revealed the importance of motivation for the participants to take part in piano learning. Motivation simply means the enthusiasm for doing something (Motivation, n.d.). Aside from the daily tasks and routine that adults may have, pursuing additional learning to their priorities requires strong purpose. Rothes, Lemos, and Goncalves (2017) found that adults with autonomous motivation will study subjects that interest them. In this study, the adult learners demonstrated that their intrinsic motivations are the driving force for piano learning which keeps them focused. The following discuss about the participant's perspectives of their motivation: (1) personal growth; and (2) recreation.

4.2.1.1 Personal growth

Personal growth can generate well-being for an individual in various ways such as career development or personal development. All the participants wanted to experience some form of personal growth but their reasons vary slightly. For some participants, piano learning is a new skill to acquire. Leonard said that:

Currently, my work life is relatively stable but I would like to place my energy and focus elsewhere by developing a new skill like learning the piano.

Leonard works an insurance agent and his work hours are flexible. Hence, he makes yearly resolutions to learn a new skill and he has done so by pursuing Japanese language studies in the past year. In the current year, he decided to pursue piano learning as it was an interest he wished to pursue since his college days. Jane shared similar sentiments:

My work as an accounts executive is quite mundane as the routines are fixed throughout the year. I would like to learn a new skill after my work hours and learning the piano is suitable as I like music very much.

She also revealed that she once learned the organ in her childhood. Her mother sent her for lessons but she felt forced and pressured. However, it did not cause her to lose interest in music. She likes listening to pop music and attends music concerts with friends. Conversely, Sandy has a different purpose:

I've been actively serving my church in the area of worship by singing but I would like to know more about chords as it is a very important element in church music. I hope the app can help me in this area.

Sandy learned to play the piano as a child and she was forced to pursue piano learning by her aunt who was her guardian and pseudo parent. Her aunt was a Yamaha piano instructor and she felt that Sandy could fall back on her piano skills as a potential career. However, Sandy's piano education did not last long as she did not like her teacher's rigid teaching style and disciplinary methods. Hence, she stopped formal lessons and only played songs that she liked during her leisure time.

For Jasmine, it is an activity that she could do conveniently due to her leg injury two years ago. She said:

I came across these piano learning apps and thought of using it to pass my time. I also thought it was the perfect activity for me because I could sit comfortably but the thought of getting a piano stopped me because my mother got rid of our piano several years ago.

She used to take graded piano exams up until she was 18 years old and stopped the lessons because she had to concentrate on her diploma. She was also actively involved in other performing and creative arts like dance and fine arts. However, her severe leg injury handicapped her passion.

Aileen indicated that:

I love music a lot and I was also involved with the Chinese orchestra at my secondary school and university. I learned to play the *liuqin* from my high school seniors and took part in the Chinese orchestra as an extra co-curricular activity. Since I started my career and recently got married, I wish to rekindle my past passion.

Aileen also shared that she wanted to play the piano when she was a young girl but her parents could not afford her this opportunity due to financial constraints. However, her musical learning at secondary school and university were possible to afford. Hence, her parents supported this endeavour. Through her experience at Chinese orchestra, she also learned to play guitar and accompanied simple songs.

4.2.1.2 Recreation

For the young working adults, they enjoy recreational activities after work hours or weekends to wind down from their busy work schedule. It helps them to relax and enjoy some work-life balance. Leonard realizes the need to take a break from his busy work schedule. He said:

I did not want just work, work and work for the rest of my life. I also feel that there is so much more than just earning money.

His interest was prompted by a video game called “Super Mario 64” which he played during his college days. He liked the end credit song of this game and even watched some tutorial videos on YouTube to learn the song by using a small keyboard

that his father owned. However, he quickly realized the limitations and did a lot of research on purchasing a piano. His parents did not see the importance of learning piano and thus, did not support in buying the instrument for him. Since then, he decided that he will revisit this interest when he is financially independent. He purchased his Korg digital piano a month before he was recruited for this study. He was looking for a suitable learning centre but by happy chance, this study came to his attention and he was willing to participate in this study.

Jane was quoted saying:

My after-work hours are frequently spent on browsing the internet or watching YouTube videos on my phone. I feel that those are not very productive activities as it makes me lazy.

As the opportunity to learn the piano came about from this study, Jane decided to take the chance to pursue learning the piano during her leisure time.

Similarly, Daniel shared that:

I feel restless these days and felt like learning something. Since I like music very much, I thought it was a good idea to learn the instrument.

Daniel also has an acoustic piano at home and thought that learning music through an app would be an interesting experience. Aileen shares the same view as Daniel and Jane on using her after-work hours for leisure learning.

In sum, the narratives of the participants indicated that personal growth and recreation are the motivating factors to piano learning. They recognize that piano learning can be a productive experience in their leisure time. For some, it is a serious endeavour as they apply piano skills in other areas of their life. Hence, Vanslambrouck, Tondeur, Zhu and Lombaerts (2015) stated that learner motivation is important as it is the moving force in the undertaken task like an educational activity. Aside from that, the participants are generally receptive to learning through a mobile learning app and they show hopes in learning productively and fruitfully. The ubiquity of mobile learning apps (Hashim, Tan & Rashid, 2014) makes independent learning inviting. Hence, many people are willing to

try this new style of learning. The rich details of the participants' motivation show that they have attained self-actualization.

4.2.2 The challenges in self-determined learning

In any learning situation, learners do face challenges that may hinder their progress in achieving their goals. The self-determined learners keep their learning goals in mind to see the desired outcome. Halsall, Powell, and Snowden (2016) stated that self-determined learners have individualistic learning styles which incorporate their personal context of many elements like technology and subject discipline. The following will report the challenges faced by the participants in the study: (1) self-management; (2) problem-solving; (3) self-reflection; (4) self-motivation; and (5) akrasia.

4.2.2.1 Self-management

The concept of time is very important for adult learners as they usually have many priorities during this stage of their life. Having a good time-management skill is vital to accomplishing daily tasks as it is prompted by good planning and subsequently, good execution of plan. Adult learners who are and can be consistent and regular in their learning routines will tend to show more awareness toward their learning outcomes as this shows that they care about the growth in their learning (Jo, Kim, & Yoon, 2015). Participant journal data supported by the interview data was important in proving this point.

Among the participants, Aileen's record sessions were very detailed and consistent. Despite some minor learning gaps due to busy work schedule and bad health from the 3rd to 5th learning week, her learning sessions were frequent and regular with a minimum of two contact sessions per week. Each session was at least 30 minutes to 1 hour. There were some occasions where she spent almost 1.5 hours on one learning

session. Through her journal entries, there is a sense that she is very enthusiastic about her learning as she would describe some key learning contents and even write some music notation on the journal page for revision and knowledge reinforcement. She even reflected on her learning behaviour in one entry on her 8th learning week:

It's been a while since I updated my journal. After I got a call from Cherylyn at the end of October, I realized that I did not take my piano learning seriously. I needed to do some research on the app courses that I want to complete. I decided that I shall complete my learning goals by the end of November and I hope to complete the Intermediate Level course.

At the beginning of the study, all the participants were asked to share the plans that they have for carrying out the learning sessions and all of them have reasonable plans like two to three 30-minute learning sessions per week or weekend learning sessions only. However, the plan execution was harder than initially thought. Leonard was quoted saying:

My work schedule is not fixed as I am required to travel at times. As you can see in the records, my learning frequently take place at late night around 10.00pm to 11.00pm. I do get tired at times and I also forget to record my learning sessions.

Besides Leonard, Jane also felt the same way about self-discipline in managing her time:

Due to some personal matters, I seriously feel that my time is greatly affected, and especially as a working adult, it is really difficult to find the will power because if you lack the energy, you just want to rest.

In Sandy's case, her moods or emotions motivate her learning. She said:

I don't like to force myself to learn as I will not enjoy it if I follow a strict time schedule. Besides, I went on a vacation with my family and there was an emergency at work too. So, I really could not help it if my learning sessions are not consistent.

Daniel had a really hard time managing his schedule to the extent that he could not start learning despite being provided the necessary tools and equipment. He had a busy work schedule and was also on a 3-week family vacation. By the 7th week of his supposed learning journey, he was contacted and a mutual agreement took place to terminate his participation in this study despite numerous reminders and efforts made to keep him focused.

On the extreme, Jasmine demonstrated high levels of discipline in her learning, even outpacing the other participants unknowingly. By the 4th week of learning, she has attempted the last known learning course in *Simply Piano* which is *The Entertainer*. In her records, she spent an hour of learning in one session aside from frequent learning sessions of twice a week. Jasmine shared:

I was so busy but I felt really gung-ho! I can't believe that I'm so into learning this but *The Entertainer* really entertained me. I really want to perfect this song. I didn't even realize that I have spent so many hours on it!

She also said:

Friday was a crazy two hours and I didn't realize that time flew by! I feel that it is challenging and that's why I can sit in front of the piano for so long.

Jasmine is a prime example of a very motivated adult learner. She did not mind spending excessive time despite it affecting her rest time and work priorities. She truly felt motivated and enjoyed her learning sessions.

4.2.2.2 Problem-solving

One of the abilities of a self-determined learner is to solve problems. Hase (2014) implied that learners have the ability and competency to acquire suitable resources for learning. Through the interviews, the participants were able to relate some problems they faced and the steps they took to solve their problems in learning. Jane shared:

I decided to do it the old-fashioned way when I struggled to remember the music notes on the staff. I printed a piece of manuscript paper and wrote down the music pitch symbols on it.

She was able to reinforce her musical knowledge through this manner as writing made her feel more connected to her learning. Aileen faced a similar situation and she shared:

I felt really confused by the music staff notation as I am very used to the number notation system. Hence, I asked for Miss Kim's help and she shared some acronyms that helped me remember the music notes.

At her workplace, Aileen sought the help of a professional colleague to facilitate her learning of music pitch. In a separate incident, she said:

When I was learning to play chords, I experienced cramps and it was painful. Then, I rested for a week and searched on YouTube for answers about this pain that I had. I realized that my posture was not right; it was not relaxed.

With both situations, Aileen demonstrated very high awareness in the problems she faced and she was being resourceful by seeking help from professionals and looking up other resources for answers.

Leonard decided to abandon *Simply Piano* altogether when he could not get past the frustrations that he experienced with the app. He said:

Before I participated in this study, I had the intention of taking formal piano lessons. Since this app could not provide what I need, I found a teacher at a music centre near my home and started proper lessons in November. I think that it's impossible to learn the piano without a teacher.

When Leonard revealed this incident, he had attended more than four formal lessons. During which time, he recorded lesser learning sessions with the app. He insisted that the rigid structure of the app learning instruction is useful but counter-productive towards his interest and motivation. He felt the need for professional assistance and thus, went ahead with pursuing one-on-one lessons with a qualified teacher. With Aileen's and Leonard's case of seeking professional help, isolation in self-determined learning is a challenge in app learning. The lack of social interaction with an asynchronous learning tool can hinder learner's progress.

In sum, the challenges of self-determined learning are not limited to the examples presented in this study. However, it does point to the fact that self-determined learning is not entirely dependent on the learner but it also needs supporting elements such as learning infrastructure and knowledge professionals.

4.2.2.3 Self-reflection

Self-reflection is important in the development of learning because it helps one to make sense of new information by relating to one's self (Wright, 1992). Throughout the study, several methods were used to record the participants' reflection of their learning

experience. Different forms of reflection were used: verbal reflection through interview questions, written reflection through participant journal and even WhatsApp communication. Through these reflections, the participants were able to share their acquired knowledge, feelings and opinion about the learning experience. Here are some examples of participant written reflections. This is an excerpt from Sandy's first learning week:

This app is fun!
I have unlocked songs and learned to play with both hands.
The app is interesting. If I played wrongly, it used a slower beat to help me practice.
I felt tired after an hour of learning and practice but I'm done with Piano Basic.

On Aileen's eighth week of learning, she wrote this:

I kept playing songs I liked in the last few weeks because they are more interesting to me but I realized that the learning courses are getting is more fun and challenging. It's difficult but I enjoy them. As a result, I find myself getting back on track and I love learning on the app when I reached Classical I. It explained the history of music.

If their journals lacked detail, they were prompted to reflect with leading questions during the interviews. For all modes of reflection used in the study, the participants showed varying degrees of self-reflection. Notably when discussing deeper details such as choice of action. Some were unable to express themselves as they did not give thought to the intention of the action. For example, Jane was not comfortable with journal reflections at the beginning of the study. Hence, verbal prompting through simple questioning helped her to reflect on the learning and choice process.

4.2.2.4 Self-motivation

Staying self-motivated in self-determined learning has proved to be challenging for some of the participants. The participants cited that more important priorities took over their desire for learning which caused them to make decisions that affected their motivation.

Sandy faced multiple distractions during the study. She said:

For the past weeks, one of my colleagues suffered a miscarriage and another got into an accident. Since it's the end of the year, I also took part in my church's Christmas planning.

She felt it necessary to work overtime to cope with the extra work. Hence, she had to forgo the time that she could use on piano learning. Aside from Sandy, Leonard also found it hard to commit to piano learning due to work priorities and personal emergencies at times. He said:

As I've informed you last week, my grandmother passed away. It doesn't help that I had work-travel plans and there were also meetings about hitting end of year sales targets. That pressure really took on me and that's the reason why I couldn't keep up.

The setbacks faced by the participants had disrupted that their learning goals and this forced the participants to re-evaluate their priorities and purposes.

4.2.2.5 Akrasia

Akrasia is a Greek word for 'lack of self-control' but it is also known as weakness of will and best described as the "disposition to act contrary to one's own considered judgement about what it is best to do" (Steward, 1998, para. 1). For study context, it can also mean the act of procrastination towards learning. Jane was observed to show lack of will during the times where an appointment was set up for follow up interviews. In one WhatsApp exchange, she responded:

Oh dear, time flies! I haven't been using the app much. I'll try to make it up before the interview.

In sum, the challenges of self-determined learning are many but not limited to the examples shown. These learning obstacles can be ascribed to human agency or the act of making choices or decisions that will either hinder or facilitate the progress of learning. As Gerstein (2014) would put it, it is important that learners have some of these traits such as the ability to persevere, being optimistic and being resilient in learning.

4.2.3 The perceptions of self-directed learning with apps

As app learning is relatively new, there are mixed views about self-directed learning with apps. The following are some findings contributed by the participants about this issue:

(1) prior experiences and readiness to learn; (2) scaffolding from the lessons and tasks; (3) intrinsic motivation; (4) uncontrollable learning environments; and (5) role of facilitator or teacher-guide.

4.2.3.1 Prior experiences and readiness to learn

Adult learning depends on prior knowledge and experiences of the learner. Hence, it is important to realize that there is a need to understand theories of adult learners and their learning styles (Wyatt, 2011). Data from this study indicated that prior knowledge and the readiness to learn are important.

As they had experience of advance music study in the past, Jasmine, Aileen and Sandy were able to progress quite quickly with the course content. They also demonstrated high levels of eagerness to learn from the get-go.

Jasmine said:

I got quite bored at the beginning because I thought I need to go through the motions of the basic lessons but I discovered that I could skip right through them. I got very excited that I could learn *The Entertainer* straightaway. I decided to just focus on that for the rest of the study weeks.

Sandy shared the same sentiments as Jasmine:

I was getting bored until you told that I could skip some of the courses. So, I went ahead and find the lesson that would help me learn new things.

Aileen's past experiences in the Chinese orchestra has helped her a lot although the music notations were different from what she is used to. Aileen said:

I was able to follow the lessons quite well even though I'm not used to reading the Western notations. The finger numberings displayed on the staff was helpful and I liked it as I also learned to play *liuqin* using numbers. I also could understand the rhythm notations as that is also a concept that I've learned before; it's just in a different form.

Although Jane studied music very briefly when she was young, she felt that she had a good restart on the app. Jane said:

I was so surprised that I could remember what I've learned when I was a little girl. It's like my memory has been hiding it at the back of my mind. So, I was quite happy to learn the initial lessons. It was fun! I hope to learn a lot from this app.

For Leonard, his limited knowledge that he had before participating in this study was somewhat helpful to him. He shared:

I didn't think it was too difficult. The lesson was very straightforward at the beginning and I could keep up with it. I was able to put in a lot of hours at the beginning of the study because I had free time at night and I wasn't too busy with work.

Upon reflection of the researcher, it was interesting to find how much prior knowledge and experience were essential and helpful to the experience of app learning. This fact corroborates with Knowles' (1980) assumptions on adult learning very much that adults can apply their reservoir of past experiences into new knowledge or skill.

4.2.3.2 Scaffolding from the lessons and tasks

The idea of scaffolding in teaching and learning came from Vygotsky and it is where teaching and learning are carried out in chunks so that learners apply acquired knowledge into advanced problems (Kupers, Dijk, & Geert, 2014). Repetitive action and error correction (Toner, 2017) seems to be the key element to deliberate practice in the scaffold method of this learning app. As an experienced educator, Jasmine indicated that the app has a good scaffolding system in its instructional design. She said:

The game feature works well for me. I like how 'they' scaffold the whole learning; they deconstruct the whole thing into different parts like Part A and Part B. In Part A, you may have three phases and the same thing in Part B. After that, it trains you to connect both the parts together. It really sets you up for success quite well.

Scaffolding helps the user learn a piece of music in chunks. However, Leonard laments that this scaffolding style becomes mundane and rigid very quickly for him as this instructional method is used throughout the app. The repetitiveness does not motivate him to learn enthusiastically.

However, Jasmine pointed out one benefit of the drills and practices. She shared:

The app is rather self-corrective as it puts you into "Practice Mode" when you make more than three mistakes. It is quite good in this way.

These impromptu drills are further supported by app features like the ‘5-min workout’. It is an optional part of the app where it offers supplementary interactive exercises to help users improve problem areas like sight-reading.

Jane said:

I used the ‘5-min workout’ a lot as it helps me to reinforce my memory. I just keep using it until I felt more confident and then I go back into the courses.

For learners like Jane, these drills are important and it provided an avenue for them to acquire the necessary skills before they learn more advanced skills.

4.2.3.3 Intrinsic motivation

Due to the unique environment of app learning, the motivation and commitment of the adult learner is important. The participants were observed to exhibit varied levels of motivation throughout the study but they shared mixed responses about advocating this learning experience with others. Jasmine said with much exaggeration:

I really have no self-control at all when I start something. There were days where I just felt tired from work but I keep telling myself, “Just do it!”. That’s why you can see that that my recorded time spent on the app is really extreme.

Jasmine demonstrated very high levels of self-motivation during this study where she was very driven to learn for long durations at a time and even prioritizing over her after-work relaxation. As an educator herself, she also pointed out that self-drive is also key to this type of learning. On the other hand, the app learning experience was not as motivating as it seemed for others like Leonard.

Leonard said:

I was quite pumped at first when I was informed about this study; I thought it was interesting. I have to say I lost interest midway because of my busy schedule and I didn’t feel that the app was motivating enough for me. It just felt like a constant drill of the same thing over and over.

The monotony of the experience due to the app instructional design failed to impress Leonard over time which caused him to stop learning from the app. For this

reason, it was the reason that he pursued formal lessons. For some, the learning motivation is affected by uncontrollable external factors, notably in Sandy's case. She said:

I just wanted to learn some chords so that I can apply it for my church music activities but so much stuff has been getting in the way. I had to sort things out at work and also the Wi-Fi issues at home.

For some with less serious learning goals, their motivation is less affected by technical issues or external factors outside of the learning environment. They were able to take the learning experience in their stride and made the best of it despite some minor difficulties like what was experienced by Jane and Aileen. Jane said:

I felt very accomplished when I was able to complete some of the lesson. Although I had problems learning some of the concepts, I felt the supplementary workouts really helped me.

Aileen said:

I like this experience very much! I do look forward to the time that I spend on learning especially when I could play more interesting songs. I do think that it takes a lot of motivation to take up this style of learning, so I wouldn't casually recommend it to anyone for serious learning.

The participants' sharing corroborated with their journal entries and also communication through WhatsApp. Whether it is the app or external factors, they responded similarly or differently depending on the situation and their personalities. This is in line with Nazareth (1999) where the intention of the participants and the continual effort of the participants are taken into account for intrinsic motivation.

4.2.3.4 Uncontrollable learning environments

Facilities, resources and equipment are vital for learning to take place. Learners depend on it to acquire new knowledge or skill. The lack of these elements will become an obstacle for learning. From the interview data and participant journal data, some of the participants indicated some technical frustrations.

Sandy said that:

I was frustrated when the app couldn't detect the pitch of my piano. It is frequently inaccurate. Sometimes, when I speak to my family member, the app detects pitch from our conversation! I even tried singing and the app also detects my voice.

Sandy also realized that her learning environment maybe too noisy as her family uses the living room frequently. Hence, the noise disturbed accurate pitch detection and sound source. A similar incident happened when Daniel first tried to use the app with his acoustic piano. Hence, he was provided the 66-key keyboard.

Besides that, Sandy also faced problems downloading the data required for the learning courses. Her home Wi-Fi connection was slow and she must place her Android device near the modem to download the necessary app data. This has often caused a disruption to her learning as evidenced by her journal. Aileen also shared a similar issue in her journal during her first learning week:

At the Essential II learning course, the app couldn't detect the "D" pitch that I was playing on the keyboard even though it is the correct pitch. I tried many times and the app still detects it inaccurately.

During this time, Aileen was using her Android device. It is also found that when a full song is being performed as a completion of a learning course, the background music will soften which cause less enjoyment and difficulties in listening to the music well. Aileen was recommended to use the earphone when using the app and it helped her somewhat. However, this situation improved when she started using a loaned iPad during the 5th to 9th week of her learning. She had to revert to her Android device when the loaned iPad was returned to her employer.

It seems that participants who used the iPad did not face many difficulties in the area of sound detection. Jasmine, Jane and Leonard did not complain of any hardware difficulties. Hence, an assumption can be made that the quality of the iPad device is more superior compared to the Android device in terms of sound detection.

Sound sensors or microphones of mobile devices are also important because it enables the detection of the acoustic piano sound. Hence, there were some notable discomforts during the learning which affected the participants' progress.

Aileen said:

I find it difficult when I used my phone because the app is not detecting the sound correctly and I feel so frustrated. I'm like, "Why is it when I press the right keys and the app still can't detect it?"

Fortunately, Aileen had the loaned iOS device given by her employer. Sandy discovered that the microphone would even detect pitch from non-keyboard sources such as her singing voice. It prompted her to sing and she realized that singing in pitch could be used to match the required note.

The importance of a tuned acoustic piano is also evident when Daniel tried using his acoustic piano. It was found to be tuned a semitone lower. Hence, his iOS device detected the lowered pitch accurately which rendered him unable to have a good start in learning. Those using keyboards or digital piano generally had no issues with pitch detection unless the volume was particularly low. Thus, a quiet learning environment is necessary for piano sound detection as sound interference will affect proper function of the in-built microphone. For this matter, Sandy said:

I could only use the app when no one is at home or when no one is using the living room. The app can't detect the piano sound well when any of us are talking.

For a more consistent learning environment, it can be concluded that a superior mobile device is important for app learning to take place. For piano app learning, it is also important to have a quiet learning environment and tuned instrument in absence of a digital instrument.

4.2.3.5 Role of facilitator or teacher-guide

The mobility and digitization of learning today enables individuals to be self-taught, independent learners and it seems that role of teachers or instructors are appearing less important. Yet, it seems that teachers or learning facilitators are still important. Most of the participants agree that a teacher is still needed to learn music with the app. Leonard

felt very strongly about it as he felt very frustrated learning to coordinate both his hands without any guidance. He added:

Seriously, teachers are very important. It's a real person. There's no way the app can replace teachers! Only a teacher can teach me things that are not in the app like dynamics. This is the reason why I stopped using the app.

Aileen also consulted a music teacher colleague to read music notes faster and said:

I didn't know that there is a shortcut to learning music notes and I was glad that Ms Kim was able to help me.

Jasmine also felt that the app is only good for training solo performance but not ensemble playing as it requires more guidance. She also said:

Only a teacher can provide the 'human' touch to music group playing. A machine can't teach you that!

In sum, the findings show that the level of self-directedness in learning with the app is quite varied. Some of the participants were very capable of self-directedness as they were able to navigate their task and problems whereas some decided that more help is needed beyond the app. This observation is similar to Thornton (2010) whereby his participants took the initiative to explore the music of their interest by reading and studying from reliable materials. Another notable mention is that some of the participants were clear in their agency towards the learning approach that they should take. They have a good sense of control towards their learning and self-construct (Taylor, 2010).

CHAPTER 5

DISCUSSION, IMPLICATION, AND RECOMMENDATION

5.1 Overview

This chapter comprises of the discussion, implication and recommendation of the study. The chapter is structured as follows: (1) summary of results; (2) discussion of finding of the study; (3) conclusion; (4) implication of the study; (5) recommendation for future study; and (6) closing remarks. In this chapter, the findings and recommendation are presented in response to the research objectives of the study: (1) the motivation of adult piano learners; (2) the challenges of self-determined learning; and (3) the perceptions of adult learners towards self-directed learning with apps.

5.2 Summary of results

Findings from the interviews, participant journal data and supplementary data brought clarity to the understanding of adult music motivation and their self-determination. It also provided some new insights and underlying matters that concern self-directed learning with learning apps. Personal growth and recreation were the motivating factors for the adult participants to partake in piano learning. These motivations demonstrated the self-actualizing behaviours of the adult learners. Besides that, human agency played a significant role in self-determined learners. The ability to make decisions and choices were very important in the adult learners as they made decisions concerning their learning paths. The participants provided mixed views about using mobile apps for self-directed learning. Generally, they feel that it is suitable for highly motivated individuals and there is a need for learning facilitators to make the experience more complete. The overall results encouraged deeper understanding of adult self-directedness in learning and the technical aspects of app learning.

The process of obtaining information could not have been done without the extensive narrative inquiry interviews and participant journals as well as supplementary video evidence and WhatsApp communication. The narrative inquiry interviews were engaged to examine the rich and detailed experience articulated by the participants. As the interviews went on, the focus was diversified based on the interesting and unique stories that the participants were able to share, especially about their personal background and their responses towards app learning.

The study was conducted approximately over four months but each participant was scheduled to have 10 weeks of learning with different start dates. Regular notes were taken based on observation and reflection about the study progress and participant details to exercise self-reflexivity. The Three-Series Interview recommended by Seidman was very instrumental in shaping the inquiry of this study but it also took on differently when deciding the duration of the interviews. Seidman (2016) recommended 90 minutes should be used for each interview conducted. However, it was not feasible especially for the first interviews conducted with the participants. Despite that, the participants were accommodating, cooperative and interested in the specifics of the study. The interviews sessions generally took on at least an hour. This applies to participants who are found to be more articulate and expressive verbally. Discussions, prompts and questions were very helpful in expressing themselves better. The participants were also monitored on their progress through WhatsApp communication and this helped to keep track of their goals. At times, they would also share their difficulties. Hence, assistance or suggestions were provided to them when necessary. These communication systems encouraged the participants to feel involved in the study without feeling too much pressure.

The multiple case design of this study was very valuable as similarities and differences in the participants' experiences were drawn from the findings. Their family

backgrounds, educational backgrounds and motivations had an impact on their self-concept and their learning journey.

Despite a short study period, the research findings were fruitful and has brought much insights to the research objectives. It is found that adult participants were motivated by personal growth and recreation to learn the piano. However, they do face challenges in self-determined learning which concerned human agency. Due to being part of this study, the adult participants provided perceptions towards self-directed learning with apps and these opinions were mixed. The following section further discussed the research findings.

5.3 Discussion of findings of the study

The following are the discussion of the findings based on the research objectives of the study.

5.3.1 The motivation of adult piano learners

From the findings, personal growth and recreation are some of the motivating factors for adult piano learning. These motivations were stemmed from specific experiences that influenced self-actualization in the participants, of which the experiences were by parenting styles, false starts and past trauma.

The parenting style imposed on the participants during their childhood or youth was quite influential. It hindered their youthful ambitions to study music. On the contrary for some, music is made compulsory and it was forced upon them as a younger individual. The negative outcomes from these childhood and youth experiences prove that parenting has lasting impact on these adults (National Academies of Sciences, Engineering, and Medicine, 2016). For these adults, it delayed their musical aspirations or caused undue pressure on them.

Besides parenting style, some of the participants experienced false starts or negative impressions about music learning during their childhood. The musical learning was strict, rigid and also consisted of mild corporal punishment. For some, it was the lack of proper resources to pursue music learning properly which ultimately caused further negative impression on music learning and anxiety. Hence, these psychological needs were not met properly due to participants' competence and autonomy during their childhood which caused them to cease musical learning over time (Evans, McPherson, & Davidson, 2012).

One participant also noted a past trauma which caused her to reflect on her being and life in general. Jasmine suffered a severe leg injury a few years ago while playing basketball with her students. This accident was traumatic as she had to undergo several operations and long-term physiotherapy. Additionally, this injury has affected her ability to dance as ballet was one of her passions. Since the accident, she felt very bitter due improper treatment from her ex-employer and she struggled a lot with her self-beliefs and values. In private conversation, she shared that music is another avenue for self-therapy as she hopes to practice mindfulness. She felt that she focused too much on the future in her past self and thus, she made a decision that would help her focus on the present. Hence, it is act of courage in the way she deals with the past as she attempts to form a new identity or an improved version of her past self. Similar views of such experiences can be found in Arai, Griffin, Miatello, and Grieg (2008) and Drummond (2012).

These personal experiences of the participants have helped them make sense of their motivation, intentions and purpose for piano learning through self-actualization. Their life histories support Maslow's theory that self-actualization that it comes in different ways for different people (Krems, Kenrick, & Neel, 2017). Hence, their sense of self-fulfilment will take place at a time where they feel that desire to do so.

5.3.2 The challenges of self-determined learning

This study has shown that self-determined learning is more than just an act of persistence. It challenged the participants to make choices and execute decisions as they progressed and stumbled in their learning journey.

As one of the pioneer advocates of heutagogy or self-determined learning, Hase (2015) clarified more than 10 years after the initial concept that self-determination is more about “human agency as a universal human characteristic” (para.7). Human agency means “the human capability to influence one’s functioning and the course of events by one’s actions” (Bandura, n.d.). Hase’s statement is significant as it clears up some misconception and it also shows that self-determination is still an evolving concept. With the support of Hase’s statement, it meant that it is the participants’ own volition that they agreed to take part in this study and their own motivations that helped them decide the purpose of piano learning. However, the study has shown that the participants faced several obstacles in self-determined learning like self-management and self-motivation. These challenges have one thing in common which is human agency.

There are four core properties to human agency which are intentionality, forethought, self-reactiveness and self-reflectiveness (Bandura, 2006). Each of these properties relates to a form of decision making. As examples from this study, the participants decided on: (1) their intention for piano learning; (2) the plan and the strategy for carrying out the piano learning; (3) the responses to the problems they had while learning; and (4) continuing or discontinuing the learning experience. Even Kenyon and Hase who are one of the proponents of heutagogy have come to recognize that human agency is the core of heutagogy (Hase, 2016). Hence, these core properties of human agency have helped better understanding of self-determined learning or heutagogy.

5.3.3 The perceptions of self-directed learning with apps

The learner-centeredness of self-directed learning involved a few basic principles which are prior experiences as a rich resource, the readiness to learn, the ability to develop learning from a task or problem and intrinsic motivation. In addition to that, facilitators or teacher-guides act as an encourager and assistants to the learning experience. Generally, the participants did exhibit self-directedness in their learning with the app but this characteristic does not mean that they are successful in their learning.

Prior experiences played a huge part in the adult participants' learning process. They were able to recall past knowledge and skill which helped them apply it into the present study, especially those with substantial or even less substantial music learning experiences during their childhood (e.g. Jasmine, Sandy, and Jane). For some, it is a transfer of knowledge from another musical system (e.g. Aileen). The richness of their past experiences helped them progress quicker which made them feel rather accomplished at the beginning or by the end of the learning journey. The role of experiences is on par with brain research which suggests that "neural networks can be either an aid or barrier to new learning" (Knowles, Holton III, & Swanson, 2015).

The adult participants' attitude towards learning readiness and learning development were evident in their behaviour. One of it is the learner's ability to be disciplined and focused. Each of the participants handled self-discipline differently. Those who were disciplined managed to show significant progress in their learning and demonstrated good self-reflection. However, some participants lacked it and were unfocused due to various reasons. Another important learner characteristic is being committed to the learning journey. As the study was about independent learning, the participants' commitment was very important if they wanted to achieve their goals. This is in part due to expectation of self towards the learning. Another important characteristic is being resourceful. Generally, the participants have shown varying degrees of this trait

and it either helped them progress in learning exponentially or less progressively. Learner attitudes and characteristics for independent learning are not limited to these examples presented by the participants. Hence, it is important to know that self-directed learning processes are embraced differently by individual learners (Karimi, 2016).

Aside that, intrinsic motivation in self-directed learning is closely related to one's agency that was described earlier whereby "human being are free to choose how they behave and what they want to learn" (Merriam & Bierema, 2014, p. 57). The adult participants have different levels of intrinsic motivation. They found ways to overcome obstacles in learning and made decisions that will help them learn. It is especially astounding in some cases like Jasmine, Aileen and Leonard. Most notably, when Leonard figured that learning the piano with the app was not fruitful and productive for him, so, he took the step of taking up formal lessons with a professional teacher. Hence, it is very unpredictable how one's internal motivation can help them in their learning pursuits.

Regarding the role of facilitator or teacher-guides, the researcher has made herself available throughout the study and offered assistance to the adult participants. However, the adult participants preferred being independent most of the time. It was only through follow up interviews where the researcher offered suggestions to the participants. Some adults prefer help on hand and sought help from other professionals. Botero and Questier (2016) did a closely similar study on MALL (mobile-assisted language learning) whereby university students were surveyed and observed for self-directed language learning on a commercial app called *Duolingo*. The study revealed that the students' motivation contradicted the actual app usage. Hence, the researchers suggested that MALL still requires the presence of a tutor for modelling and mentoring. This sentiment is in line with Knowles' opinion about the role of facilitators or teachers whereby the self-directed learner will accept instruction on occasions they recognize the need to be taught without

losing their sense of self-direction (Knowles, 1975). It is evident that some form of facilitation is still required in a music learning app environment.

5.4 Conclusion

The adult learning behaviour and motivation found in this study can be aptly described as self-actualization. It is a discovery of an individual's "creative, intellectual, and social potential" found through internal motivation (Selva, 2020, para. 8). Due to that reason, it has played an important role in the adult participants as it influenced their agency in learning. The adult participants had all their basic needs fulfilled such as a secure home, education and job with stable income. With their basic needs accomplished, they feel free to explore other activities and this is in line with Maslow's theory on human motivation. Strong self-actualizing behaviours can drive self-determined learning in a positive way that can ensure learning goals are met. Besides that, the learning app platform has shown its potential and limitation for a true learning experience.

5.5 Implication of study

The motivation, self-determination and self-directed of adult learners in this study have demonstrated varying degrees of results. As the sample is very small, not all that is discussed would be applied to all adult music learners. The individual agency is paramount to the learner motivation and self-determination. Without it, there is very little force to drive the learning journey. As with the case of young working adults like the ones in this study, it also demonstrated the shift of values and beliefs towards work-life balance. They are less interested in using unnecessary hours on work and more interested to use those hours for personal interests (Johnson, 2015).

Although it was not strongly highlighted in the results and discussion, the study also saw that the importance of game and instructional design for serious game apps.

Learning in the game environment is influenced by its goals. Hence, it is important to assess and evaluate the design to ensure that learning took place and that the game was effective for that purpose (Kirkley, Kirkley, & Heneghan, 2007). It shows that the serious game app has a lot of room for improvement and much more is to be done to make it more valuable. In view of piano learning on mobile apps, it shows a lot of promise but with time and advancement of new technologies like artificial intelligence, it may reinvent itself and improve the much needed areas through the Internet of Musical Things (IoMusT) (Turchet, Fischione, Essl, Keller, & Barthelet, 2018).

5.6 Recommendation for future study

From the findings of the study, it is recommended that the association of the following aspects is examined in further research either extent to investigate the other impacts or intend disclose the impact to do in-depth research.

Firstly, further research can increase the number of sample than the small sample used in this study. Only five working adults participated in this study. Hence, the experience and knowledge acquired by working adults should be thoroughly examined on a wider scale and could result in diverse findings.

Secondly, further research could be replicated with a longer research period and learning duration for the participants. It would be of interest to discover the learning journey of young working adults when they indulge in non-career related learning activities. There are very little studies pertaining to this age group. Thus, it is recommended that more attention be given to individuals in their prime age.

Thirdly, this study focuses on piano learning with a mobile app. A similar study can be conducted for other instruments such as the violin and guitar. Mobile music learning apps are rare and niche but few have good app design. The study of other music

instrument learning apps will contribute more understanding towards app design and mobile device technologies.

Fourthly, the data for the findings were collected through qualitative research method which was appropriate for the objective of this study. The verbal and written data were sufficient in providing the necessary information. It is recommended that a quantitative study be conducted to examine the popularity of piano learning apps.

Lastly, as observed in the uncontrolled learning elements of this study, there should be more studies to contribute technological innovations to improve the CASA technology for instrument sound detection and also MIDI data transmission for piano key weight and intensity. Such a study will benefit the music learning community in accessing mobile learning platforms.

5.7 Closing remarks

It has been an enriching experience working on this study. Part of the excitement for this study was approaching individuals who are very cooperative and adventurous to try something new. Besides that, to find that human agency played a part in self-actualization is enlightening and it broadens the scope of understanding for human psychology in self-determined learning and self-directed learning. The advancement of technology for future learning is also highly anticipated for more progressive music education tools. Upon reflection on the current events, the recent Covid-19 pandemic has affected the way of life and has impacted education globally. Institutions and educators had to quickly react to the situation to ensure that teaching and learning can still take place remotely or online. Perhaps serious game app can be a way forward in troubled times that may help in the need for immediate conceptual knowledge and skills.

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