ICT Integration in the New Arts Curriculum:

Queensland Music Teachers’ Beliefs

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Abstract

The aim of this research is to understand Queensland secondary school music teachers’ beliefs about technology integration and the Information and Communication Technology (ICT) component in the recently introduced Australian Curriculum: The Arts-Music. Previous research on technology integration indicated that many teachers might be reluctant to use technology resources in music teaching or have misunderstandings about technology integration. Moreover, some studies assumed many music teachers have negative attitudes towards the Australian Curriculum. It is imperative to understand teachers' beliefs and identify the significant barriers of technology integration in order to effectively implement the Australian Curriculum.

This research employs qualitative case study method and uses Inductive Thematic Analysis to determine the significant factors that influence teachers' beliefs. Six teachers participated in one-to-one semi-structured interviews. Findings show teachers generally have high level understandings about technology integration according to the Stages of Concerns descriptions in the Concerns Based Adoption Model (CBAM); Teachers provided positive responses about the curriculum, but they showed no immediate intention to implement the curriculum. Teachers also reported technology integration barriers including financial limitation, insufficient learning opportunities, and lacking institutional support.

The discussion argues that the teachers are yet to be familiar with the curriculum, and the reasons include a lack of school administration’s support, and teachers are considering a practical implementation plan. It is also difficult for many schools to substantially change the existing music programs without significant demands or advantages. The research analysed the barriers to future technology integration and found insufficient leadership and technical support are important first-order barriers. More importantly, teachers’ beliefs about technology integration are closely associated with their previous study experience and the quality of current professional development opportunities.

Recommendations are provided for teachers, school leaders, and curriculum agencies including taking a teacher self-assessment of ICT learning needs, providing on-demand professional development opportunities and institutional support, and offering guidance for curriculum implementation.

Keywords: Australian Curriculum, CBAM, ICT integration, Music Education, Teacher beliefs, Technologies.
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The greatest thanks go to my parents who have been supported me for so many years. In my student career, your love and support are always keeping me looking forward and striving for success.
Statement of Originality

This work has not previously been submitted for a degree or diploma in any university.

To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

(Signed) Xuanlu HU

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List of Abbreviations

ACAM: Australian Curriculum: The Arts –Music
ACARA: The Australian Curriculum, Assessment and Reporting Authority
CBAM: Concerns-Based Adoption Model
ICSEA: Index of Community Socio-Educational Advantage
ICT: Information and Communication Technologies
LoU: Levels of Use
SoC: Stage of Concerns
Chapter 1 Introduction

This research focuses on Queensland secondary school music teachers’ beliefs of Information and Communication Technology (ICT) integration in the recently introduced Australian Curriculum: The Arts – Music (ACAM) (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2013a). It investigates music teachers’ current beliefs about ICT in their teaching, their beliefs about the ICT component in the ACAM, and their anticipated barriers to ICT integration in ACAM. This chapter presents a foundation of this research by examining and justifying the context and scope of this research.

The Introduction Chapter comprises five sections. Section 1.1, Research Background, outlines the key themes of the study. Section 1.2, Research Problem, points out the issues in curriculum change and ICT integration. Section 1.3, Research Focus, narrows the scope and elaborates on the context and research needs. Section 1.4, Research Questions, presents the main and subsidiary research questions used to direct the research program. Section 1.5 shows the significance and the potential contribution of this research.

1.1 Research Background

The Australian Curriculum (ACARA, 2012b) is the first national curriculum in Australia (Cash, 2008; Pyne, 2015). It contains three dimensions of learning: Learning Areas, General Capabilities, and Cross-Curriculum Priorities. Australian Curriculum: The Arts (ACARA, 2013a) as a learning area comprises five subjects, including Dance, Drama, Media Arts, Music, and Visual Arts. In all subjects, seven General Capabilities and three Cross-Curriculum Priorities are required to be incorporated into teaching and learning (ACARA, 2013d). Information and Communication Technology (ICT) capability is one of the General Capabilities. This is the first time in Australia that ICT is not only a learning area but also a general capability required to be integrated into the curriculum (Zagami, 2015). As a part of
the *Australian Curriculum: The Arts*, teachers are expected to use ICT for instruction and they are also required to enhance students’ ICT capabilities through incorporating ICT in learning activities. In ACAM (i.e., music subject), it identifies ICT as a new method for learning music-making, adding to the existing methods—voice, body, instruments, and found sound sources (ACARA, 2013). The introduction of ICT into the *Australian Curriculum* is based on abundant research, discussions, consultations, and educational policies at national and state level (ACARA, 2012a). Research shows that integrating ICT resources in learning can have an impact on students’ learning experiences and outcomes through appropriate planning and implementation (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012; Eng, 2005; Hayes, 2007). The benefits of ICT integration are also acknowledged in music education research (Southcott & Crawford, 2011).

As a key factor of ICT integration in education, a growing range of digital software and hardware is becoming available to teachers and students (Welch & Dorfman, 2016). Especially in recent years, the rapid development of digital technology resources such as tablet computers and Web 2.0 technologies positively influence on and even change current pedagogies and the learning outcomes (Sastre et al., 2013). For instance, Riley (2016) claims six iPad Apps that enable students to create music expressively without requiring long-term training and a deep understanding of notation or other musical formalities have been developed. Moreover, Web 2.0 technologies that support an online learning community can strengthen and extend teacher–student interactions in and out of classrooms (Gouzouasis & Bakan, 2011). The development of technology not only provides a broad range of ICT resources for music education but also supports the change of education philosophy and pedagogy (Watson, 2001). Therefore, ICT is gaining importance in successful education programs in contemporary education contexts (C. Kim, Kim, Lee, Spector, & DeMeester, 2013).
Adding to the curriculum factor and ICT factor, teachers play a vital role in teaching and learning. Teachers who have advanced teaching philosophy, pedagogy, and higher quality resources may engage students in a better experience of learning (Cochrane-Smith, 2003). Despite the increasing ICT resources and the improving quality, teachers’ beliefs and pedagogies still dominate ICT use (Hughes, 2005). Since teachers have a vital role in education, they are also in a key position to reject a new curriculum (Marsh & Willis, 1999). Their beliefs about ICT integration and the new curriculum will be influential in many areas of the overall outcome (Woodrow, 1991, 1992). Research has identified that teachers’ beliefs towards ICT integration are affected by many factors (Buabeng-Andoh, 2012). These factors vary according to time, personal attributes, and external environments (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). It means each case of ICT integration will be different to others. Successful integration of ICT requires stakeholders’ careful consideration of these factors to overcome any barriers.

In this research, ICT integration is considered as a pedagogical change because teachers can promote learning by changing teaching methods and using ICT (Burnard, 2007; Peeraer & Van Petegem, 2012; Wise, Greenwood, & Davis, 2011). The implementation of the *Australian Curriculum: The Arts – Music* is considered as a curriculum change (Tsangaridou, 2013; Voogt & Pelgrum, 2005). Teachers’ beliefs towards these changes can be influential to their teaching practices.

1.2 Statement of Problem

As described above, two significant changes in education are apparent. At the curriculum level, the implementation of the *Australian Curriculum* brings many changes in terms of the content to be taught and the method of teaching. At the pedagogy level, the introduction of ICT to the *Arts Curriculum* requires that teachers make changes in their
teaching to successfully implement the curriculum. Under the influence of curriculum change and pedagogy change, integrating ICT into teaching leads to change in teachers’ teaching beliefs and capabilities. According to Fullan (2015), changes in education usually cause issues and need careful consideration and good management. The Australian Curriculum may also raise issues in its implementation.

In research relevant to curriculum change and ICT integration, many issues in the field have been identified, including

1. Many teachers may not be willing to change their existing teaching methods and content, and adapt to a new curriculum (Fullan, 2015; Kay Hartwig & Barton, 2006; Somekh, 2008);

2. Many music educators do not extensively use technology directly with students to facilitate learning outcomes (Bauer, 2013; Dorfman, 2008);

3. There are many misunderstandings and ineffectual uses of technology in current music teaching (Crawford, 2009a; Selwyn, 2016).

These issues can be identified as (1) issues within a curriculum change; (2) issues within a pedagogical change; and (3) issues of teachers’ beliefs about ICT and practice with ICT. Many studies focus on issues such as curriculum innovation and change (Ellsworth, 2000; Mckenney, Nieveen, & Strijker, 2008; Nachmias, Mioduser, & Forkosh-Baruch, 2008; Voogt, 2008); ICT integration into the music curriculum and pedagogy (Chen, 2012; Riley, 2013; Savage, 2005, 2007; Wu, 2010); and teachers’ belief of ICT (Alghamdi & Prestridge, 2015; Ertmer, 1999; Ertmer & Ottenbreit-Leftwich, 2010; Ertmer et al., 2012; Hu, 2015; C. Kim et al., 2013; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010; Prestridge, 2012).

These studies have provided valuable conceptual frameworks, research methods, and evidence for research on these issues. However, they do not directly draw on the context of the present research and the research needs of the current situation in Queensland. Therefore,
at a time when the new *Australian Curriculum: The Arts* is at early stage of implementation which means curriculum transition, pedagogical transition, and teachers’ beliefs and capability transition are experiencing a critical stage, it is imperative to investigate teachers’ beliefs of ICT integration and the new curriculum.

### 1.3 Research Objectives

The present research has three objectives:

1. Revealing the current status of ICT integration into music teaching;
2. Understanding teachers’ beliefs about ICT integration in the impending curriculum change;
3. Understanding teachers’ anticipated difficulties in implementing the *Australian Curriculum: The Arts*—Music, particularly using ICT.

The first objective is essential because it presents a foundation for understanding teachers’ beliefs about ICT integration and the *Arts Curriculum*. It is also closely related to the research problem 2 and 3 that teachers may be reluctant to use ICT and lack the necessary skills to use ICT effectively and efficiently. The second objective aims to reveal teachers’ subjective beliefs towards the description and requirements relating to ICT integration in ACAM. The third objective involves investigating barriers and needs of ICT integration as perceived by music teachers. This objective may help to address the research problem 1 as it reflects significant factors for successful curriculum implementation as well as the identified reasons for unsuccessful practices.
1.4 Research Questions

Based on the research background, research problem, and research objectives, the outline and key elements of the research are clear. This research identifies Queensland secondary schools as the context; the implementation of the Music Subject in the *Australian Curriculum: The Arts* as a phenomenon; ICT integration as a major element within the phenomenon; and Year 7 to 10 classroom music teachers as the object of study. Therefore, the **Main Research Question** is:

ICT integration in the new *Australian Curriculum: The Arts – Music*: What are the beliefs of some secondary school music teachers in Queensland?

In order to answer the main research question, three **subsidiary questions** are proposed:

1. What are teachers’ beliefs of ICT integration in their current teaching?
2. What are teachers’ responses to the content descriptions regarding technology integration in the *ACAM*?
3. What are teachers’ perceived barriers for technology integration in their future teaching?

1.5 Significance

There was a number of research projects focused on teachers’ beliefs about technology integration and curriculum implementation. For ICT integration, research indicated that teachers’ beliefs about ICT resources can be influential to their use of ICT in teaching and the beliefs were affected by many factors including personal background, resource availability, and support from the school (Ertmer et al., 2012; Prestridge, 2012). Therefore, each case of ICT integration needs a critical evaluation of the significant factors.
In terms of curriculum implementation, research also indicated that the curriculum transition involves various factors that need precise evaluation and adjustment. Moreover, completing the transition will be a complex and long process (Brady & Kennedy, 2010; Fullan, 2015). Previous research (Hartwig & Barton, 2006; Bauer, 2013; Dorfman, 2008; Crawford, 2009a) does not directly address the context of this research which is the first time that technology integration has an important role in the new national curriculum in Queensland schools. Thus, the present research is aiming to produce insights into teachers’ beliefs about technology integration and the curriculum changes while the changes are at early stages. Teachers’ current beliefs about ICT integration, and their beliefs about the ICT component in the implementation of the ACAM were investigated and analysed. The results and implications of this research can inform stakeholders and researchers in two ways. Firstly, the research can report on significant factors influencing the Queensland teachers’ adoption of ICT in teaching which reveal the barrier or enabler of further ICT integration. Secondly, when considering ICT integration as a part of a curriculum change, it can report teachers’ perceived barriers to implementation and their experience of the change. Because many education systems across the world incorporate ICT into curriculum and pedagogy (Voogt, 2008), this research may also be of benefit to other educators.
Chapter 2  Literature review

The review of literature discusses previous research that informs the proposed research. It also examines the theoretical framework for undertaking the research.

Section 2.1 draws on curriculum change, discussing music curriculum and music education technology in Australia. Section 2.2 draws on ICT and pedagogy, and elaborates on ICT resources as well as the major philosophy that underpins and influences on the development of technology in music education, including the major models and strategies for ICT integration and some applications in music classrooms. Section 2.3 outlines the major factors and barriers for teachers integrating ICT into teaching. Relevant research cases are evaluated. Section 2.4 includes the gaps identified in this review. Section 2.5 justifies this research and Section 2.6 discusses the theoretical framework of this research.

2.1 Music Curriculum and Music Education Technology in Australia

Australian states and territories started to have formal music syllabi in the 1960s (Southcott & Hartwig, 2005). Across many Australian states, various forms of music curricula existed in primary schools from the 1890s, and music in secondary schools was generally present from their inception in the early twentieth century. Using technology equipment for music education in Australia emerged in the 1960s as well (Crawford, 2009a, 2014). In the past five decades, both the music curriculum development and music education technology development have largely influenced the current status of music education in Australia (Crawford, 2009a; Southcott & Hartwig, 2005). However, the use of technology in secondary school music programs was not synchronously developed with the state music syllabus or curriculum development during this period(Crawford, 2014; Southcott & Crawford, 2011). The Adelaide Declaration on National Goals for Schooling in the Twenty-first Century (Department of Education Employment Training and Youth Affairs, 2000) was
the first nation-wide agreement among governments and education organisations to include computers and technology into curricula. Crawford (2009) believes all goals in the agreement directly involve technology. It directly pointed out the demands that “(students should) be confident, creative and productive users of new technologies, particularly information and communication technologies, and understand the impact of those technologies on society” (Department of Education Employment Training and Youth Affairs, 2000). However, this goal was not effectively addressed in Queensland that despite ICT was identified as a cross-curriculum priority, it is not mentioned in the music syllabus of *Queensland Curriculum: The Arts* (2002). Music teachers were not required to integrate ICTs in teaching. Therefore, at a curriculum level, ICT was not successfully integrated. *The National Review of School Music Education* (Department of Education, Science and Training, 2005) acknowledged this situation and suggested seven prioritised actions, including “Improve curriculum support service (advisory instrumental music, vocal music, and music technology)” (p. v).

The *Melbourne Declaration on Educational Goals for Young Australians* (Ministerial Council on Education, Employment, Training and. Youth Affairs [MCEETYA], 2008) highlights ICT as a foundation for success in all learning areas. The goals and action plans were adopted by the first national curriculum, the *Australian Curriculum*, which started the shaping phase in 2009 and the implementation phase in 2011. It experienced a complex and critical development process including shaping (ACARA, 2011c), designing (ACARA, 2013b), consultation (ACARA, 2011a, 2013c), and development (ACARA, 2012a).

In *Australian Curriculum*, ICT capability was identified as one of the seven General Capabilities (ACARA, 2013d) that directly addresses the national educational goals which enable “students [to] become successful learners, confident and creative individuals, and active and informed citizens” (MCEETYA, 2008). Likewise, *The Shape of the Australian Curriculum: the Arts* (ACARA, 2011c) describes the ICT capability in Arts as,
Students will develop and use skills that lead to ICT competence through forming ideas, plans, processes and solutions to challenges or tasks. They may use ICT in learning a concept, completing an activity or responding to a need. It may be self-generated or requested to investigate questions and issues. They will also communicate ideas and information to others while considering purpose, audience and technology and applying appropriate social and ethical protocols and practices. (p.23).

ICT capability allows students to use technology in creating, investigating, enhancing, and innovating various forms of arts. The Australian Curriculum: The Arts (ACARA, 2013a) engages ICT and other general capabilities in most of the Content Descriptions and Elaborations of all bands, to ensure the ICT integration from a curriculum perspective. In addition, the ACAM adopts ICT as a pathway to learn music making and recording that is equivalent to other music making methods such as voice and instruments (ACARA, 2013a). ACAM gives ICT a solid position across the school music learning experience of students.

Nevertheless, stakeholders’ feedback on these documents tends to be negative. In developing the Australian Curriculum: The Arts, there are two consultation feedback reports that reflect key stakeholders’ beliefs about the Shape of the Australian Curriculum: The Arts (ACARA, 2011c), and the Draft Australian Curriculum: The Arts—Foundation to Year 10 (ACARA, 2013c). Regarding the former document, only 54% of participants regarded the broad outline of general capabilities in the Arts Curriculum as appropriate. Feedback indicated that the relationships between the subject areas and the general capabilities were not clear. Respondents believed that the general capabilities may be represented differently in each art form (ACARA, 2011a). As to the later document, 60% of participants agreed on the explanation of the general capabilities. 6% of increase indicates the revision did not make a significant difference in respondents’ minds. Noticeably, in an online survey regarding ACAM, most results indicate that stakeholders disagree or strongly disagree with the
statement in the draft curriculum. Most items in the survey received more than 75% negative feedback about band description, content description, content elaboration, and achievement standards. The negative feedback reflects stakeholders’ beliefs towards the documents. Since there are considerable disagreements about the curriculum, the implementation may cause teachers to reject the curriculum. Since ICT capability is embedded in content description and elaboration, a high level of disagreement about the curriculum statement indicates that teachers may resist implementing the curriculum. In the meantime, ICT integration will be significantly affected. In another consultation report, General Capabilities Consultation Report (ACARA, 2011b), the statement about ICT competence received a high percentage of agreement.

These three consultation reports show the curriculum statement about ICT is well accepted holistically. However, regarding the Australian Curriculum: The Arts, most respondents do not support both the curriculum content and the general capabilities. At present, there is no other research investigating stakeholders’ beliefs about the Arts Curriculum. Whether stakeholders, especially music teachers will resist the Arts Curriculum is unknown. What do they believe about ICT integration in ACAM and how will they practise ICT integration when they implement ACAM is also to be investigated. Consequently, a gap in the research investigating stakeholders’ beliefs towards the Arts Curriculum and ICT integration is identified.

2.2 Information and Communication Technology, Philosophy, and Integration Approaches

2.2.1 ICT development

Webster (2011) reviewed key research in music technology and music teaching and learning from 2000 to 2011. He claims digital devices such as personal computers, tablet
computers, phones, and personal music players support music sound files well. Hard disk storage and laser disc technology as hardware resources have largely impacted on music teachers’ work. He also mentioned that tablet computers have been largely introduced into schools because of the comparatively low cost, ease of student and teacher use, and the variety of free or low-cost applications. This is supported by Gouzouasis and Bakan (2011) in their paper that examines the potential impact of creative, digital technologies on music pedagogy. They believe tablet computers such as the Apple iPad “have birthed new ways to enable digital music practice in the broad population of global music makers” (p. 3). Recent research on iPad integration in education has proved that iPads can be an ideal platform for Computer Assisted Instruction (CAI) and Computer Assisted Learning (CAL). iPads can now somewhat represent many features of the current trend of educational technology hardware development including low cost, high connectivity, interactivity, and high mobility.

Since software can realise a user’s intention by operating hardware, software gains an equal importance as hardware. According to Webster (2002), in education, CAI software started to develop earlier and helped to develop CAL software when hardware became more affordable, more accessible, and had richer functionality in the later years. Bauer (2014) provides an overview of several current technologies with direct application to music teaching, and he summarised four types of music instructional software: tutorial, practice, creativity, and games. In addition to instructional software, Bauer (2014) suggests many resources available on the Internet can be used for development of musical understanding. Webster (2002) assumes the most important trend for software development is the rise of Internet-based resources for music education.

Regarding hardware and software development and the educational applications, Roblyer and Doering (2013) provides evidence of five significant trends in both aspects: (1) ubiquitous mobile computing; (2) more sources of open content; (3) increased e-book
presence; (4) augmented reality systems; and (5) gesture-based computing. In a later publication, Roblyer (2016) adjusts many items and added another six trends that have recently emerged. She identifies massive open online courses (MOOCs), tablet computing, wearable technologies, games, and gamification, learning analytics, and 3D printing as emerging trends in the field. Roblyer (2016) also identified trends in educational applications as (1) flexible learning environments; (2) personalised learning; (3) new instructional models; (4) reliance on learning at a distance; and (5) increased educational options for students with disabilities.

The ICT development and current trends provided various ICT resources and new strategies for learning activities. Teachers and students could benefit from technology integration by adopting the advanced hardware, software, and strategies of using.

2.2.2 Philosophy

The philosophy underlying the development of hardware and software is important (Webster, 2002). Dede (2008) concludes that three competing schools of education philosophy provide conceptual frameworks explaining how people learn. These schools are Objectivism/Behaviourism, Cognitivism/Pragmatism, and Constructivism/Interpretivism. Although the educational use of ICT resources is based on these frameworks, Dede (2008, p. 45) believes “educational ICTs do not neatly cluster to discrete categories. Any given pedagogical tool, application, medium, or environment may incorporate perspectives from more than one of these intellectual positions.” Of the three schools, constructivism/interpretivism has emerged as a dominant paradigm in educational research, substantially influencing instructional design and technology in the past two decades (Li, Clark, & Winchester, 2010; Webster, 2002). According to Smith and Ragan (1999), constructivism falls within the philosophical category known as rationalism, which is “characterised by the belief that reason is the primary source of knowledge and that reality is
constructed rather than discovered" (p. 14). Under the influence of constructivism in music education, students are encouraged to "construct" their understanding of music through their experiments while being expertly guided by teachers (Webster, 2002). Moreover, Webster (2011) considers that music education has traditionally been dominated by directed instruction (i.e., objectivism/behaviourism) that is top-down in nature, with little consideration for student constructed knowledge. He suggests that it is only in the late 1990s to 2000s that researchers and educators in music education have begun to consider seriously the practice of music teaching and learning from a more constructivist perspective. According to Webster (2011), it assumes many teachers’ teaching philosophy and methodology were directed instruction based while they were at their teacher education stage and early career stage.

ICT has the potential to support constructivist learning and be used for active, authentic, and co-operative activities (Jonassen, Peck, & Wilson, 1999). ICT-mediated education facilitates instructional approaches, shifting the focus from knowledge transmission to knowledge building. Vrasidas and McIsaac (2001) believe that

> When used appropriately, technology provides a more decentralised environment where students take more control of the learning environment and become active constructors of knowledge while working on authentic tasks. Information technologies and computer networks shift the role of the teacher from knowledge transmitter to that of a facilitator who provides opportunities for interaction and meaning making to all learners. (p.129)

In turn, constructivism impacts on educational ICT development and integration. Teachers who employ constructivist approaches, such as Active Learning and Problem-Based Learning, can select the ICT resources which better fit their pedagogy. In other words, through teachers’ selections of ICT resources, constructivism can influence ICT resource development and integration.

Constructivism also influences pedagogical changes. Scott (2011) claims
From a constructivist perspective, music curricula are designed and implemented not to provide a vehicle for the efficient delivery of content, but to provide avenues for the student to explore musical problems and, by so doing, extend music content knowledge and performance proficiencies. (p. 192)

She also argues that music teachers must move away from purely teacher-centred instruction toward student-centred approaches. Teacher-centred instruction considers students are passive receptors of knowledge. In contrast, student-centred approaches enable students to explore ideas related to their own insights. Moreover, Scott (2011) states traditional approaches to instruction, such as the Orff approach or the Kodály Method, form the basis of many general music programs and will likely continue to do so. She does not think music education programs informed by constructivist theories are better than classrooms built around traditional methods. Nevertheless, she believes constructivist perspectives for teaching and learning can work in tandem with traditional teacher-directed methods of instruction to help students acquire musical skills and knowledge and apply these proficiencies as independent musicians (Scott, 2011). This means that different education philosophies and methodologies will exist in classroom teaching practices, and teachers may choose different approaches based on their beliefs.

As discussed, constructivism has its influence on ICT resource development and pedagogical change. Despite the influence of other philosophies on ICT resource development, student-centred teaching is not the only-and-best approach for teaching and learning, constructivism as a welcomed education philosophy underpins ICT development and pedagogy changes.

2.2.3 ICT integration models and strategies

Despite constructivism becoming more influential, the traditional teaching methods such as directed instruction, which draws on objectivism/behaviourism, are still active in teaching. ICT resources are used and developed for objectivism approaches as well.
Therefore, when discussing how to integrate ICT in education, there are a number of models and strategies provided by research.

Roblyer and Doering (2013) examined the theoretical foundations of directed and constructivist models, and they developed strategies for ICT integration for each model and both models. In directed models, ICT integration is used to remedy identified weaknesses or skill deficits; promote skill fluency or automaticy; support efficient, self-paced instruction; and support self-paced review of concepts. In constructivist models, ICT integration is used to foster creative problem-solving and metacognition; help build mental models and increase knowledge transfer; foster group cooperation, and allow for multiple and distributed intelligence. For both directed and constructivist models, ICT integration is used to generate motivation to learn; optimise scarce personnel and material resources; remove logistical hurdles to learning, and develop information literacy and visual literacy skills. It suggests a Technology Integration Planning (TIP) model that has three phases and a total of seven steps.

The first phase, Analysis of teaching/learning needs, involves

- Step 1: Determine relative advantage; and
- Step 2: Assess required resources and skills.

The second phase, Designing an Integration Framework, has three steps, which are

- Step 3: Decide on objectives and assessments;
- Step 4: Design integration strategies; and
- Step 5: Prepare instructional environment.

The last phase, Post-instruction Analysis and Revisions come with

- Step 6: Analyse lesson results and impact; and
- Step 7: Make results-based revisions.

In general, the TIP model gives a clear map for teachers to integrate ICT into a framework that has been proved effective. (Roblyer & Doering, 2013)

Another well-known model for ICT integration, the Substitution, Augmentation, Modification, and Re-Definition (SAMR) model, is offered by Puantedura (2006). It articulates four levels of use of ICT in education. From low level to the highest level, the levels are Substitution, Augmentation, Modification, and Re-Definition. The lower stages—
Substitution and Augmentation—refer to technology used to perform traditional tasks better or more efficiently. The concept of SAMR model is often used for evaluating teachers’ ICT integration.

Comparing the TIP model and SAMR model, the TIP model is more affected by philosophies of teaching and focuses more on systematic designing of an ICT-integrated teaching program. The procedure is clear and easy for teachers to use. While the SAMR model offers less support in strategies, it is a better tool to evaluate and navigate ICT-integrated programs. The TIP model takes the perspective of instructional designing while SAMR takes the perspective of pedagogical innovation.

Other studies provide models and strategies for ICT integration, including Donnelly, McGarr, and O’Reilly (2011), Wang (2008), Sprankle (2012), Pedagogy*Technology model (Lin, Wang, & Lin, 2012), WST model (Petko, 2012), and TPACK model (Mishra & Koehler, 2006). These models are developed under different perspectives for various needs. Despite each model having advantages to some extent, choosing a model still requires an evaluation of the context and demands.

These models and approaches for technology integration do not directly address the research questions. However, they depict methods of technology integration and provide a lens to examine teachers’ beliefs and actions about technology in their teaching.

2.2.4 Using ICT in classroom music teaching

The use of ICT in schools is now commonplace. Available research can be generally grouped into the group of introducing ICT-mediated teaching approaches or research, and a group of studies focused on particular ICT hardware or software. In the former group, articles generally offer ICT integration approaches or resources, examine the effectiveness of approaches or resources, and discuss emerging issues. Both draw on the domains of creating
music, performing music, and responding to music, Bauer (2014) and Axford (2015) offer approaches and resources to help music teachers to teach with technology resources. Bauer (2014) provides insights on how technology can be used to advantage in both traditional and emerging learning contexts. He also describes research-based pedagogical approaches that align technologies with particular curricular outcomes. Axford (2015) selects more than one thousand music-related mobile phone or tablet computer software programs and categorises them into three domains by functions. Rather than giving a specific strategy for using a software, it acts more like a directory for music teachers, with its short descriptions.

Another body of research presents ICT-mediated music teaching with particular software or hardware. Recent research broadly engages with tablet computers and affiliated software. For instance, Snodgrass (2013) examines two applications, Theory Lessons and Tenuto, for musicology learning. These two applications could be a comprehensive platform that comprises a concept introduction, example demonstration, exercise materials, and quiz. The interactive multimedia form could help students’ engagement. The course content is well-organised and easy for theory beginners. The quiz system could provide instant feedback. Using these two applications, learners could enjoy the friendly interface and the adjustable difficulty level. Williams’ (2014) study employs iPads and Garageband as a musical instrument for live performance. Garageband, as a platform, could support the student in creating and experimenting with their own music either individually or collaboratively. Because it does not require players having a high level of instrumental playing skills, every student can have the opportunity to develop any musical idea in their mind with little physical efforts. Even improvisation becomes easy for non-musical-background students. It also provides some music/al templates and loops, which eliminate the barrier between beginners and a complete music work.
2.3 Teachers’ beliefs of ICT integration

Much research focuses on how teachers perceive ICT in their teaching, including influential factors and significant barriers for ICT integration. In Buabeng-Andoh’s (2012) review, he concludes that thirteen factors influence teachers’ adoption and integration of ICT are personal characteristics, teachers’ attitudes, ICT competence, computer self-efficacy, gender, teaching experience, teacher workload, professional development, institutional characteristics, leadership support, accessibility, technical support, and technological characteristics. These thirteen factors can be categorised into personal, institutional, and technological factors, and all factors are interrelated. Since the first eight factors relate to teacher’ personal factors, Buabeng-Andoh (2012) believes the key factors in ICT integration are teachers’ personal factors, typically teachers’ attitudes toward technology or their intentions to use ICT in teaching. This is because teachers are the actual practitioners of ICT integration in the classroom. Their beliefs and attitudes will greatly impact on their own action, students’ learning experiences, and the overall success of ICT integration. This statement is also seen in Mueller et al. (2008). Buabeng-Andoh (2012) further explored discouraging factors or barriers. Barriers of ICT adoption or integration are categorised into three groups: teacher-level barriers, such as lack of teacher ICT skills and confidence; school-level barriers, such as the absence of ICT infrastructure; and system-level barriers, such as the rigid structure of traditional education systems.

Badia, Meneses, Sigalés, and Fàbregues (2014) studied the relationship between teachers’ perceptions and overall variables, such as teaching area, digital literacy, and educational ICT training. They surveyed 702 teachers and 356 school principals in Spain and identified several significant relations among the variables examined. They identified that socio-demographics, ICT-related teacher conditions concerning digital skills, and Internet access frequency have the strongest correlations with effectiveness of using ICT which is
perceived by teachers. Institutional and technological factors show less significant relations to teachers’ perception. This study has a similar finding to Buabeng-Andoh (2012), that personal factors play a more influential role in ICT integration than other factors.

A contradictory finding can be found in Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur, (2012). In this research, the results shown that the greatest barriers perceived by 78 teachers are other teachers’ attitudes and beliefs, technology support, state standards, money, technology access, and time. These barriers are identified as external factors and are perceived as “very much a barrier” (p. 428). Teachers’ own attitudes and beliefs as well as knowledge and skills, which were labelled as internal factors, are “not at all a barrier” (p. 428). This finding is contrary to the conclusions of Buabeng-Andoh (2012) and Badia, Meneses, Sigalés, and Fábregues (2014). Nevertheless, teachers in this study acknowledged that internal factors influence their ICT use. Attitudes and beliefs serve as facilitative factors in their work. Therefore, attitudes and beliefs towards ICT in teaching are still important factors and they might be less possibly to become a real barrier. This research found other teachers’ beliefs and attitudes would greatly impact on many teachers’ adoption of ICT, which indicate that as well as the external influential factors, the cultural or environmental factor might be more important than ICT resource availability and accessibility.

In music education, two studies were aimed at pre-service teachers’ beliefs of using ICT in music teaching, but these results are meaningful to all stages of teacher careers. In a six-year research that focused on pre-service music teachers in the UK, Gall (2013) used questionnaires and semi-structured group discussions to find that the most significant barrier for pre-service music teachers is lack of equipment. For musical activities, associated equipment such as sound cards are generally neither available from the school nor the educational authority and parents. Availability and accessibility of music equipment might be a major difference between music teachers’ belief of ICT adoption and that of other subject
teachers. Other major factors influencing their belief or adoption of ICT include staff support, pre-service teachers’ confidence or perceived competence, technical support, and time limitations.

Reese, Bicheler, and Robinson (2015) used a phenomenological case study method to investigate nine American pre-service music teachers’ experiences and beliefs of using iPads in music teaching. This research employs a conceptual framework, Technological Pedagogical and Content Knowledge (TPACK), which was provided by Koehler and Mishra (2006) and broadly adopted in the research of technology integration into teaching (Bauer, 2013; Voogt & Knezek, 2008; Walk et al., 2013). It found that participants have tensions that emerged during their experiences of using technology to create and teach music within the TPACK framework. Meanwhile, innovation and adaptation were observed in the research as well. After the experience of iPad-integrated teaching, participants’ beliefs of technology were observed as changed as the experience influenced participants’ openness and willingness of ICT integration in teaching.

2.4 Gaps in research

Through examining education policy, curriculum documents, and related research, this literature review has identified a need to investigate stakeholders’ beliefs towards ICT integration in ACAM. Firstly, consultation reports on the draft curriculum illustrate significant disagreement from stakeholders. How music teachers will perceive the ACAM is yet to be investigated. Secondly, detailed studies of the use of ICT in classroom-based music education are rare. It is essential to understand how ICT resources are used in teaching and the associated beliefs. Therefore, investigating the uses of ICT in music teaching is needed. Teachers’ beliefs of ICT integration vary according to time and factors. In the current context,
there is a need to understand the significant factors and barriers for teachers integrating ICT and implementing the *Australian Curriculum: The Arts-Music*.

### 2.5 Justification

Drawing on the gaps and research needs identified, this research aims to understand music teachers’ beliefs towards ICT integration in *ACAM*. Unlike the consultation reports on the curriculum drafts which simply surveyed teachers about the statements of ICT in the curriculum document, this research will take a more specific view of this phenomenon by investigating music teachers’ beliefs about the curriculum documents, understanding their beliefs about ICT integration, and revealing their perceived barriers of ICT integration. The results of this research may contribute to: comprehensively understand teachers’ views on the curriculum documents and statements of ICT; promoting ICT integration in other subjects in *Australian Curriculum*; and reporting the uses of ICT in classroom music teaching.

### 2.6 Context and theoretical framework

This research considers ICT integration in music teaching as a pedagogical change (Burnard, 2007; Peeraer & Van Petegem, 2012; Wise et al., 2011), and the implementation of the ACAM as a curriculum change (Voogt & Pelgrum, 2005). For the present context, the pedagogical change is in progress, and the curriculum change is in its early stages. These two changes have a reciprocal relationship. Better integration of ICT is beneficial to fulfilling the purpose of the curriculum change. Teachers’ pedagogy may also be influenced by the curriculum change as they are expected to follow the curriculum and modify their pedagogy to fit into the new curriculum. Therefore, this research involves two aspects for the investigation—ICT integration and curriculum implementation. Since teachers have a key role in both adopting ICT resources for teaching and learning as well as implementing the curriculum, they are identified as the agent of both pedagogical change and curriculum
change (Priestley, Biesta, & Robinson, 2013). Consequently, investigating teachers’ beliefs towards these changes can reflect the progress of changes and can help to determine issues in these changes.

In order to approach teachers’ beliefs towards changes, the Concern-Based Adoption Model (CBAM) is partially adopted in this research to examine teachers’ concerns. According to Ellsworth (2000, p. 158), CBAM is a framework for assessing and tracking the changing progress. This model is frequently adopted to examine teachers’ status of technology integration and to provide support for them (Ellsworth, 2000; C. Kim et al., 2013; Stewart, 2015; Zamani, Abedi, Soleimani, & Amini, 2011). Moreover, research focusing on curriculum change also uses CBAM as a tool for curriculum change measurement (Christou, Eliophotou-Menon, & Philippou, 2004; Tsangaridou, 2013). A number of research which employs CBAM on topics ICT integration and curriculum change have successfully identified personal and institutional issues within changes. The CBAM framework comprises three dimensions: Stages of Concern (SoC), Levels of Use (LoU), and Innovation Configurations (IC). Stages of Concern focus on the affective progress of the intended adopter during implementation. According to Ellsworth (2000), there are seven kinds of concerns, ranging from stage 0 to 6, including awareness, informational, personal, management, consequence, collaboration, and refocusing. By following the principles of the CBAM and matching teachers’ responses to the description of a stage (see Appendix. A), this model can be used to describe a teachers’ beliefs during the progress of ICT integration and new curriculum implementation.
Chapter 3 Research design

This section describes the design of this research that addresses the research objectives and research questions stated in Section 1.3 and 1.4. This chapter comprises of five sections. Section 3.1 discusses the methodology used in the study and the steps by which this methodology implemented; Section 3.2 details the participants in the study; Section 3.3 introduces the research instrument to be used in the study and justifies its use; Section 3.4 discusses how the data will be analysed; finally, Section 3.5 discusses the ethical considerations of the research and its potential problems and limitations.

3.1 Methodology

This study employs qualitative research approaches to address the research questions:

Main Research Question:
ICT integration in the new Australian Curriculum: The Arts – Music: What are the beliefs of some secondary school music teachers in Queensland?

Subsidiary questions:

1. What are teachers’ beliefs of ICT integration in their current teaching?
2. What are teachers’ beliefs of the content descriptions regarding technology integration in the new Arts Curriculum?
3. What are teachers’ perceived barriers for technology integration in their future teaching?

Qualitative research methods are commonly used in many areas including education research (Creswell, 2014). Denzin and Lincoln (2011) define qualitative research as follows:

Qualitative research is a situated activity that locates observer in the world. Qualitative research consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series
of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretative, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. (Denzin & Lincoln, 2011, p. 3)

According to Creswell (2013), qualitative research suits various needs of a research study. It is appropriate to use qualitative research when an issue needs to be explored; the researcher needs a complex, detailed understanding of the issue; the researcher wants to empower individuals to share their stories and hear their voices. For the present research, it aims to reveal the beliefs of a group of music teachers in regards to ICT integration and the impending curriculum change. This research is situated in a phenomenon to be explored, requires rich and deep data for understanding the phenomenon, and investigates participants’ experience and beliefs about the phenomenon. Therefore, qualitative research is selected for this research.

Case study is the major method in this research. According to Creswell’s (2013) statement about case study: “The investigator explores a real-life, contemporary multiple bounded systems over time, through detailed, in-depth data collection involving multiple sources of information, and reports a case description and case themes” (p.97). Similarly, Yin (2009) believes case study research is suitable for understanding real-life phenomena in depth, and particularly when the research encompasses important contextual conditions that are highly pertinent to the subject of study.

In education research, case study is frequently used as a method to present insights of ICT integration in various education settings (Crawford, 2009b; E. Kim, 2013; Starkey, 2010; Wu, 2010). For this research, data will be collected from music teachers in six different secondary schools in Queensland. Using case study method allows the researcher to understand teachers’ beliefs towards the new curriculum, explore their anticipated difficulties, and analyse these beliefs and issues with background information. When trying to find out
reasons of teachers support or resist the new curriculum, and why the anticipated difficulties are believed as barriers, case study offers the distinct advantage of enabling the understanding of specific participants’ real-life situations. Consequently, case study is selected to accommodate this research.

### 3.2 Participants

The participants of this research are six Queensland secondary school music teachers who teach Year 7 to 10 classroom music subject. The participating teachers work at six secondary schools in Brisbane, Sunshine Coast, and Gold Coast. Two teachers work at public schools and four teachers work at private schools. The criteria used for selecting participants included: (1) participant has been teaching secondary school music subject for at least one year; (2) participant has some experience of using ICT for music teaching; (3) participant is familiar with the curriculum documents of the music subject component of the *Australian Curriculum: The Arts*. Further information of each participant is presented in the Chapter 4 Section 4.2.

In recruiting the potential participants, the researcher contacted the Arts or Music departments of secondary schools in Brisbane, Sunshine Coast, and Gold Coast. By phone or email contacting, participants are invited to the program. All participants were provided with an information sheet and a consent form for better understanding the research program and participants’ rights. All interviews were conducted between December, 2016 and March, 2017.

### 3.3 Data Collection Tool

This research employs interview as the major data collection tool. According to Yin (2013):
Interviews are an essential source of case study evidence because most case studies are about human affairs or actions. Well-informed interviewees can provide important insights into such affairs or actions. The interviewees also can provide shortcuts to the prior history of such situations, helping you to identify other relevant sources of evidence. (p. 108)

This research uses semi-structured interviews with open-ended questions (Gay, Mills, & Airasian, 2011). A set of open-ended questions that draw on the research questions and other related information are designed and asked in the interview.

In designing the semi-structured interview, many questions relevant to ICT integration and ACAM were incorporated with the Concerns-Based Adoption Model (CBAM). According to Ellsworth (2000), CBAM is a powerful framework for assessing and tracking the changing progress at the level of the individual adopter, where success is ultimately determined. It is frequently adopted to examine teachers’ status of technology integration and to provide support for them (Ellsworth, 2000; C. Kim et al., 2013). Moreover, research focusing on curriculum change also uses CBAM as a tool for curriculum change measurement (Tsangaridou, 2013). One diagnostic dimension of the CBAM, Stages of Concern (SoC) was used to navigate the interview questions. The SoC address reactions to affective characteristics of change, such as their reactions, feelings, perceptions, and attitudes. Despite this research not uses questionnaire to examine participants’ concerns, the design of interview questions referred the principles of SoC. The descriptions in the SoC manual present a framework for determining a person’s concern about an innovation (Appendix C).

The researcher audio recorded all interviews with a digital recorder. Then the recording files were transferred to USB memory sticks and securely stored in a locked cabinet. Backup copies were also made and securely stored. The audio files were replayed and transcribed into text for data analysis.
3.4 Data Analysis

Creswell (2013) describes qualitative data analysis as an ongoing process to make sense out of text and image data, which involves “preparing the data for analysis, conducting different analyses, moving deeper and deeper into understanding the data, representing the data, and making an interpretation of the larger meaning of the data” (p. 183). This research gathers data from participants and analyses data with CBAM model and the Inductive Thematic Analysis. It aims to understand and interpret interview responses and seek information that addresses the research questions. Inductive thematic analysis is used as the primary data analysis approach. Since the aim of this research is to understand teachers’ beliefs, which is also a research area in psychology, Braun and Clarke’s (2006) theory and approach of thematic analysis are adopt in this research. According to Braun and Clarke (2006), thematic analysis is a qualitative analytic method for “identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, frequently it goes further than this, and interprets various aspects of the research topic”. As an important concept in thematic analysis, “a theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set” (Braun & Clarke, 2006, p. 10).

The present research gathers and analyses data for understanding participants’ beliefs, practices, and barriers. It seeks similarities, differences, and characteristics of cases. In processing the textual data, this research followed a six-phases analysing paradigm suggested by Braun and Clarke (2006):

1. Becoming familiar with the data: Transcribing data, reading and re-reading the data, noting down initial ideas;
2. Generating initial codes: Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code;
3. Searching for themes: Collating codes into potential themes, gathering all data relevant to each potential theme;
4. Reviewing themes: Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic ‘map’ of the analysis; 5. Defining and naming themes: Ongoing analysis to refine the specifics of each theme, and the overall story analysis tells, generating clear definitions and names for each theme; 6. Producing the report: The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis. (p.87, Table 1)

A qualitative analysis software, NVivo (version 11.4.0), was used to assist data organisation, information searching, theme determination, and information synthesis. Interview transcripts in digital forms were imported into the software and categorised by each participant. Through reading and getting familiar with the data, the researcher was able to generate codes and themes according to Braun and Clark’s (2006) phase 2 and 3. By further examining and categorising the themes according to phase 4 and 5, major themes were identified and refined. Finally, all participants’ responses were synthesised and each interview question was responded to by a set of themes which consisted of the major information in the final report.

3.5 Ethics

Participants of this research are secondary school music teachers in South-Eastern Queensland. Face-to-face interviews were was the major research activity for data collection. The research collected data, including teachers’ demographic information, teaching experience, attitudes and beliefs about technology integration, and attitudes and beliefs about the new music curriculum. The research uses pseudonyms to protect participants’ privacy. The interview responses were de-identified. All these participants were required to sign the plain language statement as an indication of agreeing to participate in this research study and having the interview recorded. The content and guidelines for the interview are discussed with the interviewees before the interviews. After the interviews, the interview transcriptions
were checked for accuracy by the interviewees. All data were safely stored by using an USB memory sticks and securely locked in a University office. The transcripts of recordings will be kept for five years and then destroyed appropriately. The research program was approved by Griffith University Human Research Ethic Committee (GU Ref: 2016/704).
Chapter 4  Reporting and Analysis

4.1 Introduction

This chapter reports and analyses the interview data sourced from six semi-structured interviews. The textual interview data was transcribed from the interview audio recordings. A qualitative analysis software, NVivo (version 11.4.0), was used to assist data organisation, information searching, theme determination, and information synthesis. Section 4.2 summarises the responses from the selected participants and outlines the major features of each teacher’s beliefs of three investigating areas: beliefs about ICT integration, responses to ICT component in ACAM, and anticipated difficulties in future. In Section 4.3, the Multi-case study employs the Inductive Thematic Analysis method and analyses the overall responses of all six participants that depict a general situation of teachers’ beliefs about ICT integration, new curriculum implementation, and their perceived barriers. Section 4.4 summarises the findings for further discussion.

4.2 Case Report

This section summarises and reports the main information from each teacher’s interview. Each case includes the responses that are fully or partially extracted from the interview which to address the interview questions. In each case, the teacher’s demographic information, teaching history, and school information are stated ahead for better articulating the contexts and personal stories. Within a case, the data is reported in three parts (Part 1, Part 2, Part 3, corresponding to the three parts in the interview questions), which is expected to better present a teacher’s beliefs towards the three aspects of this research program.
4.2.1 Participant 1: Adam

Adam teaches at a private boy’s college where the Index of Community Socio-
Educational Advantage (ICSEA\(^1\)) is 1132 (2016 data). He has about 30 years of teaching
experience. He is the head of department and teaches Music and Music Extension subject for
many year levels. Adding to the teaching and administration work, he conducts rehearsals for
music groups. The average size of a class is about 20 students.

Part 1:

The ICT resources that are accessible at the school include computer labs, iPads,
Keyboard, LaunchPad, and audio interface. Similar to other teachers, Adam frequently uses
Sibelius, GarageBand, and YouTube in his teaching. He regards ICT as a tool which can be
used in various ways. In his example of using GarageBand, he explained his intention and
approach of teaching,

“So kids will use GarageBand for writing soundscapes for putting things
together. So a typical lesson might be just talking about how sounds works how
different sounds create different genres, what's appropriate for different genres, how
to put written melody harmony together so the boys will do that with an iPad.”

The advantages of using ICT in Adam’s view, is it presents an authentic and
simultaneous aural feedback to the user, he said, “When students composing, they can hear
the created music in real time.” Based on this view, Adam regards his role is to spend time
investigating the best ways of using the ICT resources as well as to reduce the chances that
errors occur on classes. Besides the pedagogical aspect and the technological aspect, he

\(^1\) ICSEA: A value on the index corresponds to the average level of educational advantage of
the school’s student population relative to those of other schools. (ACARA, 2014).
believes a music teacher and a musician should be keeping up with the development on the music field,

“That's what music is, musicians are always looking at ways of finding tools to create art, and to create new music, and at the moment we live in a world of technology, so it makes sense that we do what musicians have done since the beginning of time.”

Part 2:

Adam was involved in the development of the Arts Curriculum as he was a member of the learning area reference committee. He provided feedback, attended meetings, and delivered curriculum information to his colleagues. The curriculum document gave him an impression that it is straightforward, easy understood, and very practical for use. He believes incorporating ICT into a curriculum is an important part for a modern day music teacher. In terms of the impact from the curriculum document, Adam feels there will be no significance as his pedagogy is constantly changing to meet the best ways of teaching. The curriculum document is mainly providing a scope for him on teaching. He is pleased to see music is a mandated subject among the learning areas. However, he thinks the overarching curriculum is very crowded that the music subject is being threatened on the schedule.

Part 3:

Adam does not have technological concerns or barriers for his teaching. He supposed that in order to better integrate ICT resources, a teacher must spend adequate time on investigating the resource to ensure its proper use. Due to the traditional training methods, music teachers are lacking technology training while they were studying music and preparing
to be a teacher. He suggested that some teachers may need to pick up new skills and have a new mind set for their work especially for ICT integration.

4.2.2 Participant 2: Clark

Clark teaches at a private co-educational college where the ICSEA index is 1132 (2016 data). He has 13 years teaching experience. He is the head of the music department and he teaches Classroom Music and Music Extension for Year 7, 11, and 12. A typical size of his Year 7 class is 28 students. Combining his teaching and administrative work, his work load is approximately 50 hours per week.

Part 1:

In Clark’s response, he selectively used many ICT resources for various year levels and teaching objectives. Sibelius, GarageBand, and Pro Tools are the software he frequently uses. In his example of using GarageBand for Year 7 students learning electronic dance music, he instructed students to create and arrange music loops to produce music pieces. His main focus was on developing students’ understanding on texture, structure, form, and timbre. Though he uses ICT resources quite extensively in his teaching and work, he only uses ICTs when it is necessary and is the best platform for musical engagement. In terms of the issues of ICT integrated music teaching, Clark believes a well-planned lesson can negate many issues but he has a concern that sometimes students do not have real understandings of the learning content. The convenience of ICT resources causes students to learn and operate devices with very superficial understanding. He also admits that ICT resources sometimes can distract students. However, as a teacher, he is able to prevent these problems by good planning and management.

Part 2:
Clark participated in many activities related to the new curriculum including professional development sessions held by the Independent Schools Queensland and Australian Society for Music Education. He believes the new curriculum is generally good with detailed information and flexibility and further explained, “A good teacher can find the important aspects and teach well with the curriculum.” He also thinks a curriculum can hardly satisfy everyone but generally it is well written. In terms of the impact from the new curriculum, he believes he is constantly changing his pedagogy and material to best cater for the learning needs of his students; meanwhile his teaching has already fulfilled many requirements on the curriculum. Therefore, there will be no significant impact on his current teaching. Nevertheless, Clark expressed the new curriculum document provides a guideline for him to reflect his teaching methods. The aspect that he dislikes is the general framework of the curriculum and its impact on the music subject. In his view, each art form has its own distinct system and term. Therefore, he believes words such as “Making” and “Responding” are not very appropriate to be used in the music subject.

Part 3:

A major barrier that Clark is concerned about is the reliability of ICT resources. Since many resources are Internet-based, once the Internet connection goes down, many activities or tasks cannot be carried out. Clark believes a teacher cannot easily cope with issues such as a computer crash or software failure due to poor quality and low performance of student’s laptops. He believes financial limitation is the major reason for these issues. He believes the rapid development of technology also brings challenges to teachers. Inadequate time for investigating and learning new resources becomes a barrier. At the end of the interview, since he believes that he is already on the way to achieve the expectations of the new curriculum, there will be no significant change in his teaching. Adding to this point, Clark expressed he
will be aware of the changes on the nature of music learning engagement and change his teaching accordingly.

4.2.3 Participant 3: Sarah

Sarah works at a public secondary high school where the ICSEA is 1052 (2016 data). She is an early career teacher with 4 years of teaching experience. She teaches Classroom Music for Year 8, 9, 11, and 12, as well as a few vocal groups and the school choirs. The average size of her classes is about 24 students. Her weekly teaching load is approximately 30-40 hours.

Part 1:

In Sarah’s interview, she mentioned Sibelius, MixCraft, and NoteFlight as her frequently used software. Her use of ICT mainly serves the purposes of display scores, play audio files, composition, arrangement, and software tutorials. Accordingly, she uses visual equipment to display the teacher’s screen and demonstrate the operation techniques on software. She also frequently uses software such as Sibelius and MixCraft for teaching composition and loop arrangement. She appreciates that ICT resource provides simultaneous aural or visual feedback while students are composing and learning. Benefit from the convenience and functionality of ICT resources, she uses ICT frequently, and she believes technology is “extremely important” in her teaching. She also enjoys the extensive range of ICT based resources. As a common way of teaching with ICT, she introduces and demonstrates with ICT to carry out her teaching materials and objectives. She acknowledges a massive change brought about by ICT as she uses a theory and aural website where students can learn and practice by themselves. Sarah’s only concern about ICT is the reliability and
compatibility issue. She mentioned that a few good programmes cannot ideally run on students’ laptops and this is a problem that she dislikes and is addressing by herself,

“...because just the inconsistency with laptops and technology in school. And of course teenagers bringing their laptops, bringing their charges and not having the capacity to hold, or support Pro Tools or Mixcraft properly, and then they might lose weeks they might not be able to do much on their laptops.”

Part 2:

Regarding the new Australian Curriculum, Sarah did not receive any information from the school and did not attend any related activity. She only learned about it in 2013 while she was studying the Graduate Diploma of Education. After reading the curriculum document, she felt her colleagues and her current teaching are similar to the descriptions on the document. Therefore, she felt there will be no significant change to her teaching as she is carrying out the intended curriculum. However, she felt the fast-developing technology resources may bring some challenges to keep up-to-date. She believes the new curriculum is good and specific but the time allocation needs more details, “it's very it's very specific, which is good. I like that. But at the same time, I don't know how many of these are going to hit... like, depending on how long you've got your class full.”

Part 3:

In responding to Question n) and o) (See Appendix A.), which reveals the barriers that teachers identified and the reasons, Sarah felt her personal music learning background is a barrier because the traditional music instrument training method involves very low application of ICT resources. She had no experience on ICT integrated teaching. After becoming a teacher, she had very limited chance to access ICT related training. In a more personal aspect, she also does not have the time for investigating ICT resources. Furthermore,
the inequivalent student capability on ICT and learning also is a barrier while she is teaching with ICTs, she explained,

“Some students don’t know how to use them. They very very unsure and different learning abilities and learning difficulties or disabilities in the class. They would some that excellent in the computers, some really don’t.”

In the last question, Sarah expressed her willingness to change her teaching to better implement the new curriculum. However, after a long hesitation, she had no clear idea about how to change and unsure of the direction for change.

4.2.4 Participant 4 Jane

Jane has been teaching in many schools in the Gold Coast area. She currently works at a public school where the ICSEA index is 1017 (2016 data). She has about 20-years experience in teaching classroom music and instrumental music classes. The average size of her class is about 15 to 20 students. According to her description, she has a high work load as she teaches classroom music subject for many classes and the instrumental groups of the school. She also does tutoring privately on instrumental classes.

Part 1:

In Jane’s teaching, she frequently uses software like SmartMusic, Sibelius, and GarageBand. When she uses ICT resources for a lesson, she will ask students to use a tuning software to tune the instruments. During the lesson, SmartMusic is heavily used as it provides various functions for music activities. Jane acknowledges the convenience and functionality brought by ICT resources. With ICT’s assistance, the music learning experience could be more relevant to student’s real life. She emphasises that using ICT in music teaching could improve student’s learning autonomy, which can help students develop critical thinking skills,
confidence, and be more independent. The changes brought about by ICT resources also reflects on the ways of music learning when comparing with the traditional approaches,

“I think it's changed because we don't have to be so complex anymore. They can actually make music without all of the rules. The rules can be simplified, and also just making it more - that more relevance of student enjoyment, while learning important concepts.” (Jane)

Jane’s concern regarding ICT focuses on the external music communities’ support for technology. As external music examinations (e.g.,, Australian Music Examination Board) and competitions (e.g.,, Eisteddfods) do not allow the use on technology devices in the activities, she feels this can be a barrier when she wants to integrate ICT. She also has a minor concern that students may be distracted by the technology device while learning. In addition, she feels sometimes using ICT takes more time to teach.

Part 2:

Jane stated she did not participate in any activity relevant to the new curriculum and expressed her opinion towards the curriculum,

“The education system - because it moves so fast, they spit the information out at you, and you just need to be on top of it all the time. So there's not actually any training within that. So I think because they think we can grasp those concepts - but it's more based on the code of conduct aspect of it.”

After reading the curriculum document, Jane feels the content and descriptions are straightforward and flexible. She believes the curriculum encourages teachers to use more ICT under a tight budget. Moreover, it encourages teachers to be open to technology development and promote students’ various capabilities. Therefore, as a result of the curriculum, Jane believes there will be more autonomy for students in the future. In the meantime, teachers will have to learn more for better teaching results.
Part 3:

In responding to the barriers for future teaching, Jane mentioned again that the external music communities’ support on technology will be a barrier. Adding to this, she felt quality training opportunity, technology reliability, and financial limitation, are hindering her best use of ICT in teaching, especially the support from the school and the professional organisations,

“One of the things that I do find, also, with ICT, is being an itinerant teacher that moves, we don't fit in the system often. So with ICT, we can contact the Queensland ICT, but they can't help us because it's school-based, and if we're not at the school when the ICT people are at their school, we're left unsupported completely.”

The traditions in music education, the teacher’s own professional background, and time for ICT learning are influential barriers as well. In the technology aspect, since the school has limited ICT resources for use, a major change she expects is to acquire more IT resources. She also expressed that she will change her pedagogy when having ideal facilities,

“Make the students more autonomous. So train the students to be more self-directed. Introduce more creating learning experiences through the use of technology, and the classroom flipping more from the traditional teacher led to the student led.”

4.2.5 Participant 5 Steven

Steven teaches at a private college where the ICSEA index is 1085 (2016 Data). He has about 12 years of teaching experience and 7-years experience teaching classroom music subject. Currently he has other roles at the school so he has a reduced teaching load. He teaches classroom music subject for Year 6 and 7 classes and conducts instrumental groups at the college. In these lower year levels (Year 6 and 7), the class is about 25 to 27 students.
From Year 8, the music subject becomes an elective so there will be fewer students ranging from 16 to 18 in a class.

Part 1:

In Steven’s college, most students have their own iPad and a few students use laptops. In his teaching, he uses software including Sibelius, Finale, and GarageBand. The software is used for creating sounds and arranging music in the junior years. Students in the senior years use Sibelius for notation. Steven runs workshops or tutorials to demonstrate the operational skills for students. He also uses Internet based resources such as YouTube that let students be exposed to the rich learning opportunities. However, he noticed that sometimes integrating technology does not bring any pedagogical advantages. Therefore, his choice of technology is depending on the actual benefits and he explained,

“So, the benefits in terms of students’ knowledge makes things a lot easier now in terms of what they know and how they can access it, and also can cut down sometimes the teaching content time and give them more time to actually be practical in terms of the classroom and their learning experience.”

Based on the benefits, Steven uses ICTs frequently in his teaching and enjoys the convenience and functions. He recognises his role is to have students learning with ICTs in a constructive way and open their minds. In terms of the concerns about technology, he felt effectively monitoring students’ use of devices in class and plagiarism are challenges. Teacher’s use of ICT in a constructive way is also mentioned as a concern.

Part 2:

Steven is a Queensland Curriculum and Assessment Authority (QCAA) music panel member and he has attended many trainings and meetings relevant to the new curriculum. He has also had discussions with colleagues at his school and started preparing for the
curriculum implementation. He expressed there is no major concern in terms of the upcoming changes as he and his colleagues have already been using ICT resources for a long time and their teaching already covers the descriptions on the curriculum. Furthermore, he felt the curriculum has certain flexibility and could be interpreted slight differently. The major advantage of this curriculum in his view is it encourages teachers be open to technology and prepare students for the future world, he said,

“So I think that the positives of that is that we are setting that up, so we're teaching students how to use those programs, we're exposing them to that world. Because if they go on to be musicians, composers in the professional world, that's the world in which we work in now is a technology world.”

Part 3:

Steven acknowledges that many professional development sessions can provide valuable things to teachers. However, he said, “But with the constraints of teaching, the demands on teachers' daily life, sometimes those sessions are skimmed over or you go to a PD session to learn about that and it's too above the teachers who are there.” He also felt that the teachers’ own mind-set sometimes hinders them to actively adopt technology in teaching. An example he gave is a teacher who was scared that students have higher technology skills and thus avoided using technology to maintain his classroom authority. Therefore, he believes quality training on technology is desired for teachers as they were trained in their discipline in a traditional way without much opportunity in technology integration training. In terms of the upcoming changes, Steven expressed that nothing will change significantly as they are on the way to achieve the goals, but he will change his teaching depending on the advantages of using ICTs and its value on educating people in long-term.
4.2.6 Participant 6 Austin

Austin teaches at a private secondary college where the ICSEA index is 1103 (2016 Data). He has 26 years teaching experience as a music teacher. He teaches classroom music subject from Year 5 to 12 and English subject for senior years. He has a full working load consist of 85 percent of full teaching, four choral rehearsals a week, and a church service. The average size of a class is about 20 students.

Part 1:

Sibelius, GarageBand, and PianoTime are three software programs that Austin used frequently. He also uses Google for searching information about music and YouTube for performances. Sibelius is extensively used in composition as it “connects notation to the sound”. GarageBand and PianoTime served for music arrangement and pitch perceiving purposes. Austin strongly believes using technology for music education should be based on the genuine needs of music capability development and pedagogical purposes. He takes the advantage of technology such as providing simultaneous aural feedback to improve music literacy. In term of a teacher’s role in technology integrated music learning, Austin insists that a teacher’s role is still important in knowledge and skills instruction and teacher’s direct instruction is an efficient way for delivering knowledge. He has no concern about technology itself but music teachers’ teaching competency and training quality.

Part 2:

Austin expressed he has read the curriculum documents and has decided to adopt some items with his colleagues. He thinks the curriculum is generally good, broad, and flexible. The items relevant to ICT are also acceptable and practical. He believes his school is already achieving the goals and there will be no significant changes. Nevertheless, unlike his
school which has a high standard of facilities and resources, he concerned that many schools with different backgrounds and resource may be hard pressed to implement the curriculum very well without adequate time, staff, and training. He again emphasised teacher’s capability on the subject and pedagogy is more important than the curriculum and the assistance from technology.

Part 3:

Personally, Austin has not many barriers in using ICT and implementing the new curriculum. He believes the barriers for the future are more relevant to equity and funding that many schools are not resourced well. The reason of this barrier in his view is the governance of the education system. With mature music programs and music specialists at the school, Austin believes the school is achieving the outcomes of the new curriculum now, so there will be no significant change happening in his school.

4.2.7 Section Summary

This section summarises and reports each teacher’s teaching profile and their responses to the interview questions. In the three parts of the interviews, six teachers’ beliefs about technology integration, new curriculum implementation, and barriers for future teaching are presented. Many noticeable statements are quoted in order to reflect a teacher’s beliefs and to support data analysis. In general, teachers have various options and methods when using technology devices in teaching. The objectives of using an ICT resource vary between teachers in different circumstances. Teachers shared many opinions about ICT’s role in music teaching and the teacher’s role in ICT integrated music teaching. They have different levels of knowledge and participation experience with the new Australian Curriculum: The Arts—Music subject, which were often affected by their positions at their schools and personal backgrounds. Generally, they believe the new curriculum is well-written.
and practical. At the same time, their current teaching is fulfilling many goals in the stated documents of the new curriculum. The descriptions and requirements in the document will have no or little significant influence to their teaching in classrooms. However, they felt they are encouraged to use more technology resources in teaching and the curriculum document can be used for reflection purposes to improve their teaching. Teachers expressed many concerns about barriers for future teaching, including financial barriers, training opportunities, facility quality issues. At the end of interviews, the teachers generally showed no intention to considerably change their teaching to meet the new curriculum as they believed they are already achieving the goals.
4.3 Multi-Case Analysis and Findings

Using the Inductive Thematic Analysis approach, this section reports and analyses the responses of the three parts of the interview. Each part focuses on one aspect of this research program and respectively explores the answers of three subsidiary research questions. Themes emerged during the process of Inductive Thematic Analysis by the researcher reading, analysing, and moderate interpreting the responses. In the responses of an interview question, themes are presented by describing major information and quoting the most representative response of a teacher. By reviewing the final themes and summarising the major features, the analysis presents information for finally determining some answers for the subsidiary research question.

It needs to be noted that although the sample is only six teachers, the responses may contain and reflect many aspects of the current situation of ICT integration and the implementation of the ACAM in Queensland secondary music classrooms. Moreover, participants may only mention one or a few resources, opinions, methods, or experience in a single interview, however, they may also share and use other participants’ method, opinion, or experience. Therefore, this multi-case analysis regards the six participants’ responses as a whole and examines the major characteristics to respond to the three subsidiary research questions.

4.3.1 Teachers’ beliefs about ICT in current teaching

4.3.1.1 Question a) What technology resources do you use for your music teaching?

This question shows the software and hardware that teachers used in their teaching. In terms of software, despite the small sample, most teachers mentioned Garageband and Sibelius in the software category. Other software, including Pro tools, YouTube, Finale,
Piano Time, FL Studio, MixCraft, Note Flight, SmartMusic, mind-mapping application, and Sound Cloud, are easily accessible for music training purposes with certain hardware setup. Regarding hardware, participants are able to access computer labs, iPads, the Internet, laptops, Mac computer, music keyboards, LaunchPad, microphone, and audio workstations. This group of hardware could be generally categorised into the computer (e.g., computer labs, iPads, laptops, and Mac computers), communication infrastructure (e.g., Internet facilities), and music professional equipment (e.g., music keyboard, LaunchPad, microphone, and audio workstation).

4.3.1.2 **Question b) Could you describe how you use an ICT resource in teaching?**

In responding to this question, teachers provided various ways to use a range of software in their teaching. As a popular software, Garageband is mostly used for music or sound production. This includes students writing soundscapes, arranging loops, and creating sounds by an internal keyboard and a built-in microphone. For senior years, Sibelius is used heavily and throughout composing. The table below shows the general use of the ICT resources in teachers’ daily teaching practice.

Table 1. Typical usage of ICT resources

<table>
<thead>
<tr>
<th>Resource</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td>Searching for music information and resource</td>
</tr>
<tr>
<td>YouTube</td>
<td>Performance</td>
</tr>
<tr>
<td>Garageband</td>
<td>Music or sound production</td>
</tr>
<tr>
<td>Sibelius</td>
<td>Notation, Arrangement, Composition</td>
</tr>
<tr>
<td>Piano Time</td>
<td>Perceiving Pitch</td>
</tr>
<tr>
<td>MixCraft</td>
<td>Music and loops Arrangement</td>
</tr>
<tr>
<td>SmartMusic</td>
<td>Music learning platform with various functions (assignment submission, practice, score reading, etc.)</td>
</tr>
</tbody>
</table>

The Music Production group includes the use of ICT for notation, arrangement, composition, and music software operation tutorials. Most teachers mentioned their use of notational software for notation, arrangement, or composition. For instance, Austin said: “...the most directly relevant music ones that we use are Sibelius. That’s used extensively for notation, arranging and composing. As well we use GarageBand for composition and for the instrumental timbres.” As to music software operation tutorials, both Steven and Sarah use the relevant software and hardware to demonstrate the operational skills and process of how to use the software in the form of tutorial or workshops. These practices are prerequisites of student using the technologies and serve the purposes of music notation, arrangement, and composition.

The Musicianship development group includes the use of ICT for developing knowledge, skills, and capabilities relevant to musicianship development. Many teachers use ICT resources for developing an understanding of pitch, harmony, and rhythm. Adding to this,
Austin aims to improve music literacy and oral perception of notation through the use of ICT resources. Furthermore, Clark stated his main focus for using software like GarageBand is for students making sense of music texture, structure, form, and timbre in a particular unit.

Resource Accessibility is another reason that teachers use ICTs in music teaching. The Internet plays an important role in providing access to a large number of resources online. Steven sees it as a chance of exposure to access a wide range learning opportunities and content instantly and effortlessly.

Basic Level Functions include instrument tuning with certain software, play audio files, display digital format music scores, and so forth. The basic level functions on technology devices are often used to replace or improve the functionality of many relevant mechanic or electronic device such as a mechanic metronome or a tape recorder. The utilisation of basic level functions may not involve much pedagogical changes in teaching and learning. However, teachers use these functions frequently and widely, as these functions work more conveniently for completing many tasks.

Teachers also use software which can work as a multi-function platform for music teaching and learning. In Jane’s example, she uses a typical multi-function platform software for her classes, named SmartMusic. The software can work on desktops, laptops, and tablet computers (e.g., iPad). The main functions include accessing a wide range of repertoire (score, audio, video, composer information, background information, etc.), creating assignment and marking, simultaneous feedback while student practicing, and managing student’s learning progress and providing guidance timely. These features help teachers construct a system that they can have a streamed workflow without spending much time on
finding and gathering resources. Many integrated features also improve the experience of learning for students which are also beneficial to teacher’s work and raise positive attitudes toward ICT integration.

Teachers’ responses to question a), b), c) and d) (See Appendix. A) revealed their beliefs and practice about ICT in their teaching including the role of ICT in teaching, the advantages of ICT, and the frequency or dependency of using ICT resources. Three teachers regard ICT resources as a supporting role in their teaching: Steven expressed that he tends to not overuse technologies as music is a practical subject; Clark only uses ICTs for where it is actually valuable and beneficial; Sarah loves it (ICTs) as a “side thing”. Contrastingly, in terms of ICT using frequency or dependency, many teacher states they use ICTs frequently and heavily, especially using DAW software (Digital Audio Workstation) for composition. The advantages of ICTs have two aspects. In the pedagogical aspect, an advantage that teachers strongly and widely acknowledge is “notational software connect sounds to symbol powerfully and more directly” (Austin). Similar statements are “(it) combines timbres in instrumental and composition teaching”, “simultaneous aural or visual feedback while composing or learning” (Sarah), and “easier to grasp the content, more time to be practical” (Jane). In the aspect of student capability development, Jane believes using ICTs in music learning brings “more student autonomy, more independence in learning awareness” as well as “more critical thinking”. These descriptions reflect teachers use ICTs frequently in teaching certain contents, they also take advantage of ICT for teaching and learning, though many teachers regard music is a practical subject that technologies serve best as a supporting role.
4.3.1.3 Question e) What is the importance/role of using ICT in your current teaching?

In examining teachers’ beliefs about the importance or role of using ICT in teaching, teachers’ responses are generally similar to the responses of previous questions as the importance or role of ICT is largely based on their functions and methods of use. The responses can be categorised into five groups, which are genuine musical learning needs, pedagogical needs, functional needs, and capability development.

One of the most significant roles of ICTs in music teaching is it serves for genuine musical learning needs. “...you use it (ICTs) if it’s going to offer genuine support to what it means to think musically and act musically, so you don’t just use it because there.” Clark stated, “So it’s really about using if it when it’s necessary and if it is the best tool to support the student.” Similarly, Austin would not like to be incorporating music technology at the expense of musical development. He wants to “make the ICT improve education, not just replace things that are already happening”. These statements, adding to the previous responses, reflect that teachers regard ICTs at a supporting role, and it plays an important part in improving music teaching and learning for certain contents.

In the pedagogical aspect, two themes are apparent in the teachers’ responses. The first one, authentic and simultaneous sound feedback was mentioned many times by most teachers. Adam said, “So the thing that technology does is it makes it real like and composing whether using a score or on Sibelius or whether they're using an audio program, it’s they're creating real music and they can hear it.” Since students can aurally or visually receive feedback from devices, the improved learning experience facilitated the overall learning progress, and ultimately posed positive influence on pedagogy. Secondly, Jane provided a view that using ICT can keep music learning more relevant to students’ daily life, and
improve student’s sense of wellbeing, worth, and confidence. Certain ICT resources can virtually or authentically present a learning environment and give the student a high autonomy to experiment and develop ideas and understandings without many professional techniques. This can be a relief to many pedagogical difficulties and facilitate pedagogical development in many aspects.

The function aspect is mainly about the improved convenience and functionality by replacing the traditionally used devices or tools. Sarah said, “students save and submit composition assignment with a USB and I can just listen to it on laptops, and it’s just so much easier.” This statement reflects that a digitalised, paperless assignment solution can address many issues and bring convenience to assignment completion, storage, marking, and feedback. Another theme, Authentic and simultaneous sound feedback, was emphasised again towards this question in teachers’ responses, which can be seen as a significant function other than replacing or improving traditional ways of music teaching and learning.

In terms of learning development, teachers believe using ICTs in teaching could be important in developing students’ thinking skills and fulfilling the demand for ICT capability for the future. The aforementioned theme “enhancing student’s sense of worth and confidence” which was raised by Jane also can be accounted into learning development. The concept of learning development in this context contains thinking skills, personal capabilities, and personal psychological aspects such as self-efficacy, sense of worth and confidence. For higher-order thinking skills, Austin said “The basic job of a music teacher in a school is to make people think better. So any subject that has a literacy in it provides a child an opportunity to develop skill in abstraction. To be able to abstractly represent any concept is a considerable educational goal.” With ICTs, students can easier comprehend abstract
concepts and develop thinking skills in a more efficient way. As to fulfilling the demand for ICT capability for the future, Steven believes “Obviously the next generation need to know how to use technology, that’s their world”, incorporating ICTs into the learning process creates a chance for students to develop ICT capabilities. The learning experience with ICTs also gains the sense of worth, confidence, and possibly the sense of achievement as students can easier receive feedback and enhance the understanding of knowledge and skills then a better outcome could be achieved easier when comparing with the traditional way of learning.

4.3.1.4 Question f) What do you think about your role in student’s ICT mediated learning experience?

In responding to this question, teachers have various opinions that can be generally placed under four themes in which teachers should: 1. Ensure a good learning environment and ICT setup; 2. Pedagogically adopt; 3. Support overall capability development; and 4. Upskill content knowledge. These four themes could generally reflect how the participants believe their role in the music teaching with ICTs and their major tasks.

The first theme, ensuring a good learning environment and ICT setup, has three subsidiary themes. The first sub-theme is Creating a good environment for learning. Adam stated that,

“A lot of my preparing for classes is investigating technologies, investigating what platforms that work best on. Having to work out how to say for iPads, how to get that technology out onto the iPad, how to get licenses for it... You know in a robust situation in a classroom because once you've got 25, 30 kids in the class, it's really important that the actual technology works so you've got to invest that time.”
This statement also applies to other teachers who try to use a new device, a function or an innovative use of an existing resource, that setting up a reliable hardware and software is essential to all work afterwards. The second sub-theme is Changing ways of teaching preparation (technology aspect). Having the situation aforementioned, Adam feels the way that a teacher prepares for classes has changed a lot. He said, “A lot of time you have to do a fair bit of tweaking to get that actually working.” A teacher might have to spend extra time on the technology aspect adding to the original preparation process, which can be a change to the ways of teaching preparation. The third sub-theme is Providing opportunities to use ICT for best musical engagement. In Clark’s opinion, he only encourages or provides opportunities to use ICTs when it is necessary and serves as the best platform for musical engagement. According to this, the teacher’s decision about ICT use becomes a significant part in fulfilling the teacher’s role in student’s music learning.

The second theme is Pedagogically adopting. This theme has a mutual relationship with the first theme that once a teacher adopted ICT resources technologically, his/her pedagogical strategies might be changed accordingly. Therefore, the first subsidiary theme -- Providing an opportunity to use ICT for best music engagement echoes the third sub-theme in the last paragraph. Similarly, it requires teachers to make changes in their way to prepare for classes in terms of pedagogical aspect in order to let the lesson be a worthwhile experience in the classroom (Adam). Another noticeable theme is Constructively introducing and demonstrating operational skills for ICT resources. With devices in students’ hands, many teachers believe their role will be instructing students to operate the software or hardware. Introducing concepts, skills, and demonstrating the process are the major part that a teacher needs to do. Steven gave an example that students have GarageBand on their devices and he
said, “they mess around it, but they actually don’t know the functions of it and what it can actually do.” Then he emphasised that a teacher’s role is actually teaching and showing students how to use ICTs in a constructive way.

The third theme, supporting overall capability development, also echoes the fourth theme in Question e)—Learning development, as using ICTs might benefit student overall development. Then teachers’ role, becomes supporting overall capability development. More specifically, Steven expects his teaching can impart higher level knowledge, thinking skills, and opening students’ minds that could enhance overall capability development.

A minor theme that relates to the first and third theme is the teacher’s own learning and upskilling. Adam said, “As a head of the department, my role, a lot of times is learning how to use the technology myself...” Since incorporating ICTs changed ways of teaching preparation and pedagogical strategies, Adam’s thought reflects that teacher’s competency in using ICT and using ICT for teaching need to be updated accordingly.

4.3.1.5 Question g) How the technology resources had changed your teaching?

This question was being asked to three teachers who took the interview at later dates. Four themes appeared from the responses. A significant one is ICT changed ways of teaching preparation which has been mentioned in the previous responses. Adding to this, Steven admitted that on many occasions, students know much more than teachers. So he was kept very open to learning from students. This type of learning can be seen as a change to teacher’s learning and teaching preparation. Teachers also benefit from the enriched resource and increased student autonomy brought by using ICTs. Steven gave an example of how YouTube can overcome a problem in teaching and learning,
“So if you're talking about for example a concept of something in class and the students are just not getting it, talking about a musical concept. Like I go back to the YouTube thing again, you can just type it into YouTube and bang there it is. So you can actually show the students or play it to the students so they can then actually understand what it is that you're talking about in terms of a musical context. Again they have access to that, they can do that themselves but it's just showing them sometimes how to actually do that.”

From this example, it can be seen that YouTube gives a platform for accessing resources which can address a pedagogical problem. Meanwhile, students also gain autonomy in managing their own learning progress. Jane has a similar view and she emphasises that ICTs simplify rules in learning,

“I think it's changed because we don't have to be so complex anymore. They can actually make music without all of the rules. The rules can be simplified, and also just making it more - that more relevance of student enjoyment, while learning important concepts.”

The four themes that emerged show teachers’ positive attitudes to use ICT in optimising teaching and learning. The recognised advantages of ICTs helped teacher and students access more resources and reduced the difficulty of pedagogical challenges. The advantages are closely interconnected as well.

4.3.1.6 Question h) Do you have any concerns about ICT integration in music teaching?

Themes emerged from the responses to this question can be categorised into 5 groups. The main themes are: 1. Technology reliability and compatibility issues; 2. Inappropriate use
of ICT; 3. Reducing chances for deep-learning; 4. External music community or assessment do not embrace technology; 5. Possibly higher time demand for ICT integrated teaching.

A common concern that teachers expressed is the reliability and compatibility of technology devices and software. Many teachers’ concerns were about “the out-dated devices not run reliably”, “laptops obviously don’t support the software that ideally”, and “resource poor as in the time also stops them from going further into more resources”. These concerns reflect the hardware has reliability issues and compatibility issues with certain software. Quoting Adam’s words, “You know in a robust situation in a classroom because once you've got 25, 30 kids in the class, it's really important that the actual technology works so you've got to invest that time.”, a teacher has to spend sufficient time to set up an ideal environment for classes. However, it might be impossible to address such issue during teaching preparation. Moreover, a teacher can hardly fix the problems of reliability and compatibility simply by investing more time. After experiencing these issues for a number of times, the teacher may have to change the teaching strategy and avoid using ICTs anymore.

The second concern identifies students inappropriately use of ICT in the study. Though not all teachers expressed this concern, two teachers mentioned that students may get distracted and off task when they are working on their own devices. Plagiarism can also happen as students can easily find sources to copy and paste.

The third concern for teachers is using ICTs may reduce chances for deep-learning. The concept of deep-learning in this theme contains many meanings, including critical thinking, innovative thinking, perseverance, and resilience in study. Two teachers’ responses that are noticeable include extra consideration is needed while using ICTs. Jane said,
“Students not always being on task, so you have to really check all of the time whether the students are on task because they are too interested in ticking the box, rather than actually critically thinking about it and achieving the task. So with ICT, they expect the same. They expect the reward of achieving the task really quick. Sometimes it's not. Then they have this sense if they don't achieve this task, they then don't think they're good at it because they're time poor and resource poor.”

This statement mainly reflects the chance for critical thinking being affected by using ICTs and students may expect a fast reward from ICT. Similarly, Clark provided his view of this problem,

“They're just drag-and-drop things around and create composition, but have no real understanding of how it’s structured and or very superficial understanding of how it's built and what the musical data within that actually means.”

Since technology gives students a sense of convenience and power, they may expect more from technology. This causes teachers concern about the development of critical thinking ability. In other words, it reduces the chance to learn deeper and more insightfully.

The fourth concern is brought by Jane, who is an instrumental teacher as well. Her work combines classroom music teaching, instrumental teaching, and managing the instrumental groups. She is concerned about the external music community as assessment does not embrace technology very well. Since external music assessment such as AMEB (Australian Music Examinations Board) and music competitions such as Eisteddfods do not allow the use of ICTs in examination or competition, teachers may find it difficult to find ways of using ICTs in achieving some objectives.
The fifth concern is the higher time demands for using ICTs. For many teachers, using ICT sometimes may take more time while preparing the lesson, and also longer time for students to learn and experience. Jane said, “There is so much within the curriculum to do that the ICT sometimes takes so much longer, and they need the time and the guidance within the school time to do it.” However, Jane believes the outcome shows students are more autonomous in learning. Therefore, higher time demand can be seen as a minor concern and may come with some good outcomes.

There are teachers who do not have serious concerns in responding to this question. From Adam’s perspective, he sees technology resources as an integral tool of the trade. “Looking back at the history, best musicians could follow and take the advantages of technology development. So do music educators.” He emphasised, “That's what music is, musicians are always looking at ways of finding tools to create art, and to create new music, and at the moment we live in a world of technology, so it makes sense that we do what musicians have done since the beginning of time.” Another teacher Steven believes a good lesson planning can negate a lot of concerns.

4.3.2 Teachers’ beliefs about the new curriculum
4.3.2.1 Question i) What have you experienced about the new Arts Curriculum (e.g.,
training, meeting)?

The teachers provided a number of activities relevant to the preparation and implementation of the *Arts Curriculum*. Based on the activities available, two levels of involvement are identified.

In the Higher-level involvement group, many teachers expressed:

1. They are early adopters of technology ahead of the new curriculum and provided feedback on the curriculum (Adam);

2. They have been actively involved in the preparation stages of the curriculum development, for example, Steven said,

   “So we've done some training in terms of the rollout. We've also had faculty meetings in terms of the new arts, the roll out of the new ACARA, the arts curriculum in the next couple of years. We're starting to implement some of that at the moment so this year is our trial year, we're going to fully implement that next year and then that will obviously be rewriting of units or restructuring of units to encompass the new objectives within the new curriculum. So we're in the process of that but we're not fully implemented just yet.”;

3. They attended meetings to receive information from the government or professional organisations and deliver the information to colleagues in their own schools, a teacher said “my job is talking about that into new members, you know the younger members of staff” (Clark);

It is worth noticing that teachers who provided the information above are in the executive roles of the department. Their experiences and opinions may be different with many teachers who are not in leadership positions.
On the other side, three teachers are in the lower-level involvement group. One experienced teacher said “We’ve read the curriculum. We haven’t necessarily had training in the curriculum because really there's not a great deal that's new if you teach in Queensland. So that's about it.” (Austin). Another experienced teacher Jane said,

“No, the only thing that we've been receiving training on is more on our actual teaching, and the new curriculum, the education system - because it moves so fast, they spit the information out at you, and you just need to be on top of it all the time. So there's not actually any training within that. So I think because they think we can grasp those concepts - but it's more based on the code of conduct aspect of it.”

Their responses suggest that the preparation and implementation of the curriculum have not covered all schools and teachers at the moment, and many teachers have not paid much attention to the upcoming changes.

4.3.2.2 Question j) What do you think about the new Arts Curriculum and its descriptions relating to ICT?

Before answering this question, teachers were provided with a sheet with the content descriptions relating to ICT integration in the ACAM Year 7 to 10. (see Appendix. B). Teachers were advised to read the sheet before responding. After reading the content description, teachers expressed various opinions. Both similar and different opinions can be identified. In general, teachers have a positive attitude towards the content in the curriculum document. However, Clark feels the curriculum document is hard to satisfy everyone’s needs as teachers have a different background, capability, and local circumstance, minor concerns can be found in the responses.
The most significant positive comment is that teachers believe the content descriptions are fairly general, flexible, practical, straightforward, and easy understood (Adam and Steven). The curriculum document is also fairly well detailed and informative in a teacher’s view (Clark). In terms of ICTs, teachers believe “the curriculum document sets ICT as a supporting role and provides a scope to use ICT, however it is not too saturated with ICT” (Clark). Adding to this, Adam believes an ICT integrated curriculum is an important part of a modern day music teacher. Moreover, Clark commented, “I think a good teacher can look past all of the wordiness of it and just look into what's important and teach from that really well.”

Another positive comment from Jane draws on the general capability development. “I think generally - I think in general, it is more creative, which goes along with the creative thinking which is also more critical thinking. I think it also brings up a new language that they're going to speak in. The - so for the general academic values, I think music would be more complementary. At the moment, music is still a little bit separated and it's not valued so much. But using the creative thinking skills that this will foster, and the critical thinking - because critical thinking is thinking deeper, and further beyond, or creatively. Applying creative strategies to find answers to questions. So I hope that this would bring music as a more important subject to help academic.”

From this comment, the Arts Curriculum not only guides music learning at school but also develops critical thinking and creativity for students’ life and academic. It echoes the
principles of the *Australian Curriculum* that promote lifelong learning and develop various capabilities.

A concern expressed from Austin: “I don't have any problem with the new arts curriculum. I think it's fine. I think it's quite able to be implemented. Some of the year 10 outcomes are perhaps a little ambitious even in our school. So I don't know how those outcomes are expected to be achieved at schools without staffing, without time, without training.” From this statement, it can be seen that the curriculum document has certain aspects to improve and further information and assistance are needed while teachers start to implement the curriculum at their schools.

Another aspect revealed from the responses is that teachers compare their teaching and reflect their work based on the curriculum document. Sarah read the document and said “It likes it is what I do. It seemed and from other teachers talk about, it seems to be what we do.” Similarly, Steven said “But I think for the majority of staff and other schools I've spoken to in terms of music we've been using technology in that way for quite some time now already.” The teachers’ responses reveal that they examine their teaching with the curriculum document and feel their teaching is fulfilling the curriculum.

4.3.2.3 Question k) How do you think the curriculum documents will impact on your teaching Especially the ICT aspect?

In responding to the impact of the new curriculum, three themes of teachers’ thoughts can be identified. “No significant impact” is a major theme that many teachers believe in. Alternatively, some teachers believe the new curriculum encourages teachers to use ICT in many ways and it provides a guideline to reflect teaching methods.
Four out of the six interviewees expressed that they will not change their teaching in terms of the impact of the new curriculum. Although the sample size is small, it may represent a certain number of music teachers in Queensland who have a similar opinion. Looking at the responses, teachers’ views are similar:

1. “Not really because as I said we've always been using it so it wasn't something that we had to change with something that we've already doing before.”
   (Adam)

2. “In terms of impacts on my teaching I don't think it will change a lot. As I said we already do a lot of this already.” (Steven)

3. “No, no. because the unit's implement pretty much all of this.” (Sarah)

From these responses, the data collected revealed that the main reason that teachers are not impacted by the new curriculum is they believe they are already carrying out the expected curriculum in the aspect of ICT integration. However, despite the fact that teachers will not change much, they felt they are encouraged to use more ICT resources in their teaching.

1. “They will impact on my teaching a little that they will encourage me to make more use of ICT.” (Austin)

2. “So I think I don't ever really change my teaching greatly, but it will certainly provide me with something to reflect upon.” (Steven)

3. “It's - what I would like to see is, it's a support network, which may give more of an outlet for the alternative music. ......So I'm hoping that this will allow us to then explore other avenues, and to give them more of a sense of worth and confidence to the students.” (Jane)
These three responses reflect the positive attitudes and expectations that these teachers have on their use of ICTs. A guideline to reflect teaching and a support network for a tight budget situation are the roles of the ICT in the curriculum that teachers expect.

Sarah’s response for this question focuses on the challenges from the ICT. She said, “I think because technology is always changing, always updating, that can be a challenge in the classroom, like keeping up-to-date with how everything is changing. Definitely.” This response is more relevant to the technology aspect rather than the impact brought by the new curriculum. However, it can reveal a fact that teachers may consider these factors as a whole thing. Therefore, there is a need to examine issues happening in the process of ICT integration in the Arts Curriculum before determining that the issue is caused by the curriculum.

4.3.2.4 Question 1) What do you see as the positive and also negative aspects of the new curriculum?

This question explores further the teachers’ beliefs about the curriculum. After many times of reading and comprehending, the responses are grouped and analysed based on general attitudes. A general finding is the positive responses are similar to the themes in the last question, however, the neutral and negative responses are different.

In the positive aspects, the common themes are “Broad and Flexible”, “Good and specific”, and “Develop capability for future”. These themes were mentioned in the last question, many teachers provided further explanations. about their understanding. Regarding
the theme “Broad and Flexible”, Clark’s response clearly articulates his understanding and attitude toward the curriculum on the positive side.

“I think everything sort of there for you, musical activity is at the heart of everything that's happening in there. I think it's fairly well articulated. I think every everything is there for a teacher to work from. There is also the capability for you to do things the way you want to do them as well that's not so prescriptive that you have to do something in a certain way it's actually quite broad and I think for a good teacher that's a really good thing.” (Clark)

“Fairly well articulated” and “everything is there for a teacher to work from”, these two phrases reflect the curriculum is broad and close to a teacher’s work. Moreover, “to do things the way you want to do” and “not so prescriptive” reflect the flexibility of the curriculum in the teacher’s mind. These factors give the teacher an impression that “for a good teacher that's a really good thing”.

In terms of “Develop capability for future”, Steven provided his understanding in the music aspect,

“I've already said this but we are moving into technology, so that's what our students will be in a technology world. It'll come very soon. I'm not even sure, it might even be that way at the moment, the conservatories of where composition is no longer generally handed in in manuscripts. It's all done electronically. So I think that the positives of that is that we are setting that up, so we're teaching students how to use those programs, we're exposing them to that world. Because if they go on to be
musicians, composers in the professional world, that's the world in which we work in now is a technology world.”

Steven aims to develop skills for the future musicians who might work with technology devices in the music industry. Though he did not mention about the curriculum, his thought is echoing the principles of the ACAM. The phrases “setting that up” and “we’re exposing them” reveal the teacher’s recognition of the curriculum in the ICT aspect. Adding to the positive aspect, Steven also shows his preparedness and confidence of the upcoming implementation of the ACAM,

“So there's certainly lots and lots of advantages to it. I tend not to look too much at the negatives but I think if you're looking specifically at technology in the syllabus I don't think there's much there which is too scary or anything that we haven't been really prepared for.”

The neutral opinions are generally not directly relevant to the curriculum itself. For example, Jane feels “the ACAM gives student higher autonomy meanwhile it will take more time for teachers to learn the new content and skills.” Whether the teacher regards the learning is an extra work or a pathway of professional development will largely affect her attitude towards the curriculum.

As to the negative aspects, there is no significant evidence showing teachers have any thought against the ICT aspect in the curriculum. Nevertheless, there are teachers disliking the general framework of the entire curriculum, and expecting further assistance and development once it is implemented. Clark believes the music subject or other arts subjects
have their own system and cannot be described or categorised in some ways to fit into the entire curriculum framework,

“In terms of negatives, I don't really like the fact that the arts are seen as one big thing. I think music has quite a distinct way of working like visual and I was like all the other art forms do. They use the terms “making” and “responding”, I'm not really crazy on. “Making” is just too blurry, it could like when I play music I make it on some level when I compose something I'm make it on some level. Yes, it's similar activities but also quite distinct, and quite different and the Arts just makes it one big blurry mess almost. So I guess also look through that, look beyond that and look into what do I need to teach and that's the sort of these elaborations and descriptions and things and that's very musical, but the general framework of what I don't like too much.

Sarah also expressed a concern about the details of implementation,

“I like that. But at the same time I don't know how many of these are going to hit... like, depending on how long you've got your class full. Like if you have that class for a year maybe you will hit all of these points, but if you have that class for just a semester, you probably not gonna hit all the points. That's just that's class at our school.”

This concern reflects that many teachers are not clear about the curriculum and need further instruction with a detailed implementation plan at a school level.
4.3.3 Teachers’ barriers for future ICT integration and curriculum implementation

4.3.3.1 Question n) What barriers can you identify that may affect you integrating ICT in your teaching the new curriculum? AND Question o) In your opinion, what are reasons of these barriers?

These two questions are reported together because many teachers’ responses are similar to the two questions. Many teachers mentioned a perceived barrier in Question o) which he/she may not come up with while answering Question n). Furthermore, the barriers are closely relevant to the reasons and teachers often discussing them together. Therefore, these two questions are combined for the analysis. This section reports the major barriers and reasons to outline the overall situation.

According to teachers’ responses, there are five major barriers identified that hinder ICT integration in classroom music teaching. The barriers are named by its theme: 1. Lacking sufficient quality training; 2. External music community and assessment do not embrace technology; 3. Financial limitation; 4. ICT reliability; 5. The inequivalent capability of students.

The first barrier “Lacking sufficient quality training” includes two subsidiary themes. The first sub-theme “Time to learn and investigate technology resource” is based on a personal aspect. The second sub-theme “Lacking quality training opportunity” is more relevant to the school and professional community aspect.

As to the first sub-theme, Clark and Jane’s statements could reflect many other teachers’ voice,

“So there's a barrier for me is the time to learn or have access to and learn and sort of like upskill myself to know that, kind of stuff. I keep I try and keep as
current as possible but it's quite impossible sometimes. Coz it developed so rapidly today."

“The only barrier is the learning barrier. Just having the time to really know the ins and outs of the new technology that you're using before you give it to the students. Or the same thing is you're learning with the student, sometimes, because you just don't have...”

In these responses, both teachers acknowledged they have the needs and motivation to learn the new technology resource but time is a barrier. The former teacher tended to believe the fast developing technology resource is a factor of time barrier while the latter teacher tended to believe the time spend on understanding the best use of the resource is a factor of time barrier. It can be assumed that the reason that time limitation becomes a barrier might vary between teachers.

The second sub-theme “Lacking quality training opportunity” is also noticeable as many teachers agree on this point as sufficient training experience is a crucial source of the teacher learning the emerging knowledge and skills. The following quotation reflects a teacher’s feelings about this issue.

“So I think the big thing is that actually PD sessions and training sessions with the staff with teachers, there's so much exposure and so many great things out there that we can do in our classrooms with technology. But with the constraints of teaching, the demands on teachers' daily life, sometimes those sessions are skimmed over or you go to a PD session to learn about that and it's too above the teachers who are there. So I think the actual integration of how we actually do some of this really
needs to be looked at in terms of the actual syllabus document and how that's actually rolled out in a classroom situation in a variety of ways.”

In this statement, the teacher appreciates the exposure and learning opportunities at the professional development sessions. However, he also points out that it has some restrictions that may not be suitable for all teachers to adopt. His final thought is directed at the school level and the professional organisation level of curriculum integration and implementation. The teacher’s response is based on the context of learning ICT skills and implementing the curriculum. According to this, one can assume that the ICT skills and pedagogical adoption of ICT resources need a strategical integration method from the school to support teacher learning in ICT and the ability to use it meaningfully in the curriculum.

In Question o), a major theme “Teacher’s concerns and mind-set” involves a few aspects that may affect teachers time allocation and willingness in learning technology related knowledge and skills. One concern that Jane raised is that the heavy use of ICTs takes away opportunity for developing the ability of deep-learning and resilience. This point is mentioned again and the teacher emphasised the point on developing a student’s resilience.

“So any task that is - requires more thought than just immediate answer, student's resilience become low. So students will start getting upset once they've tried it four times and can't get it. So with technology, that's great, because that helps solve that problem, because technology often makes things easier. But it - the barrier then, we're then taking away from them those hard tasks where they need to learn that resilience.”

This concern reflects a possible drawback of ICT integration in terms of the way it is being used in teaching and students’ beliefs of ICTs.
Another sub-theme under the theme “Teacher’s concerns and mindeset” is about teacher’s own music learning background and ICT capability. Both an early-career teacher and a mid-career teacher expressed that they did not have the chance to study with ICTs while they were studying their instruments in the past and to become a teacher,

“For me when I was learning music it wasn’t through technology. And like a lot of these programs when I started teaching were new to me. I mean I know it now and stuff but it's still quite daunting, having to learn all this stuff, and then making sure I’m... you know, one step ahead of the kids.” (Sarah).

“We're generally most music teachers are trained in their discipline of their area, so they might be a disciplined clarinet player, they've gone to the conservatorium and learned how to play the clarinet very well, they've gone and done a teaching degree. But we are now faced with the situation of where we need to be versed in ICTs and you almost need a technology degree sometimes to get around the platforms and things that teachers have to use in our daily lives.” (Steven)

The two statements above show music teachers’ professional background and training are not covering the technology aspect. In terms of the reasons, a teacher reveals an important fact that the music education system has its own developed system of teaching and learning without technology assistance,

“In my opinion, because my - for the last 400 years, my field has stayed the same. You go along and see Vengerov play. He doesn’t play (with technologies) - still an acoustic instrument with acoustic backing instruments. So because there is so much within - which says, great. These instruments that we're using in the music excellence class, their orchestral instruments are still standing on their own.” (Jane).
The three teachers’ opinions reveal that a music teacher who trained in the classical music system may lack technological training and need extra time in learning to use ICTs in his/her classroom music teaching. The fast developing technologies require a teacher to have higher level of ICT capability in order to effectively adopt and integrate ICT resources into teaching practice.

Another sub-theme is teachers’ mind-set and confidence of using ICTs. Two teachers mentioned that many late-career teachers may not be very willing to use ICT resources as they are scared and not confident to use ICT with students,

“Whereas someone who's been teaching maybe 40 plus years may have a bit more - they may be a bit more scared by that. As I said earlier sometimes teachers do get scared by that because students know a lot more than what they do about it and that tends to become a bit of a barrier for teachers where they go I've been maybe for want of a better word like the authority in the classroom, the holder of the knowledge that imparts it.” (Steven).

Similarly, the second theme raised by Jane who said “External music community or assessment do not embrace technology” is relevant to the traditional system of classical music since the activities such as music competitions and examinations can be dominant in the classical music field. The use of technology in the performance or examination may not be accepted. If this is the case, teachers like Jane are less likely to use ICT resources while preparing for the activities. Indirectly, it reduces the chance for teachers and students in the teaching and learning with ICT resources.

Teachers also regard technology reliability as a barrier which causes problems before and during classroom teaching. It also affects the whole learning experience and outcome.
when ICT takes an important role. Some technological problems that teachers mentioned are network failure, laptop system crash, and printer failure. Many teachers believe an important reason for the problems are because of financial limitations.

Regarding financial limitations, teachers believe it is a foundational problem for ideal teaching and learning activities.

“So if they go - as I said, they can't compete in competitions, because the competitions say no technology. So the barrier, also, is money. Monetary. It's also not only just my budget, but it's the students. It's a poor economic area. So for example with SmartMusic, not all the students have SmartMusic. So then do they feel separated from the rest of the class, because they don't feel quite integrated, because they don't have access to all that stuff.” (Jane)

This response suggests both school resource allocation and family background affect ICT resource availability and it is associated with the financial capacity of the school and student families. It could become a barrier that a teacher cannot really integrate and implement the technology resource in teaching in order to cater for the difference. The financial limitation is widely acknowledged as a barrier in teachers’ beliefs about ICT integration.

Further analysing the responses, teachers’ voices are directed not only at education funding, equity, and justice but also the governance of the education system as well as the society’s value on education.

“I think a bigger problem will be equity in ICT integration. There are lots of schools which simply are not resourced like that. So I think there will be an issue in other schools of equity and justice. I think schools won't spend the extra money they
need to get music software that's industry standard. They'll go to the lowest common denominator. I think that's unfortunately. I don't think that's a fault of the syllabus. I don't think it's a fault of the curriculum planning. It's a problem of resourcing. It's to go straight to the lack of equity in education funding in Australia. ..." (Austin)

“...Lack of proper funding of education of students, a lack of putting students first and political decisions which are aimed to provide the cheapest possible result instead of the best educational result. Often the education results are not considered important unless they're to deal with numeracy or literacy.” (Austin)

These two responses reflect that the governance of the education system and the management of educational funding are influential to technology integration.

The last barrier was mentioned by a teacher that the inequivalent capability of students,

“They are very very unsure and different learning abilities and learning difficulties or disabilities in the class. They would some that excellent in the computers, some really don’t.” (Sarah).

According to the response, the teacher identified the diversity of a student’s background and ICT capability. In many occasions, using certain differentiation strategies in catering for all students is an important part of teacher’s work. However, the large capability gap between students might challenge a teacher’s teaching. That caused the teacher’s concern particularly in the ICT aspect.
4.3.3.2 Question p) Will you change your current teaching strategies to meet the needs of the new curriculum?

Among the six teachers, three teachers show no immediate intention to change their current way of teaching. Each of them has their own thoughts about whether to change or not:

1. “I’m always changing my teaching strategies, So no. That just like a constant thing that changing all the time.” (Adam).

2. “Not really because at present we are achieving the outcomes of the new curriculum now. ... we still have the luxury of having discrete and individual music lessons for our students. We won't have to change a lot. I think it's very difficult in schools where they presently have a music specialist and that music specialist teacher is being asked to deliver all the curriculum areas in the same amount of time. I just don't think it is reasonable or practical.” (Austin).

3. “Look, not greatly to be honest. I think I do really trying to keep current with stuff all the time and very reflective and have read through these millions of times and I sort of check things off that I'd already or get ideas for things that I might know. so I don't know if we'll really radically change anything.” (Clark).

A major characteristic of these three teachers’ responses is that they believe they are already doing or achieving the goals of ICT integration in their teaching. They all believe the new curriculum will impact insignificantly at the early stages. Meanwhile, their current teaching frameworks are somewhat successful and not easily changed. Thus, they are in a process to be familiar with the curriculum and evaluating the potential benefits of the changes. As aforementioned, the new curriculum document offers a general and flexible framework that teachers can interpret and practise to suit a school’s local context and circumstance, the
delivered curriculum in real situation may or may not match the descriptions of the curriculum document.

A teacher who works at a relatively lower social economic status school expressed she would purchase more ICT resources to improve teaching and learning. This factor is regarded as indirectly relevant to the new curriculum itself though ICT facility is essential to ICT integration and curriculum implementation. Another teacher expressed that she would make some changes however she is not clear about the direction to make the change.

4.4 Summary of Findings

- Part 1: Teachers’ beliefs about ICT in current teaching

This section investigated teachers’ beliefs about using ICT in their teaching. Data revealed that most of the teachers interviewed commonly use notational software (e.g., Sibelius and GarageBand) and online search engines (e.g., Google and YouTube) in their classes. The hardware that teachers can access includes three groups: computers (e.g., laptops and tablet computers) communication infrastructure (e.g., Internet facilities), and music professional equipment (e.g., audio workstation). Analysing the responses revealed that teachers’ purposes and general methods of using ICT resources for music teaching can be categorized into five groups that are: 1. Music Production; 2. Musicianship Development; 3. Resource Accessibility; 4. Basic level functions; 5. Multi-function platform. Moreover, the role of ICT in the teachers’ view can be identified to accommodate the needs of: 1. Genuine music learning needs; 2. Pedagogical needs; 3. Functionality needs; and 4. Capability development needs. With the assistance of technology resources, teachers’ beliefs about their role in the music teaching are also identified as: 1. Ensuring a good learning environment and
ICT setup; 2. Pedagogically adopting; 3. Supporting overall capability development; and 4. Upskilling content knowledge. With the advantages of technology resources, teachers admitted that the way of lesson preparation has been changed. Technology resources bring convenience and functionality to music teaching and benefit both students and teachers when students gain learning autonomy and teachers can access more teaching materials as well as optimise pedagogy. In the meantime, the changes also happen to a teacher’s own learning of the new resources and methods of instruction. Teachers also expressed their concern about ICT integration in their music teaching. There are five concerns observed: 1. Technology reliability and compatibility issues; 2. Inappropriate use of ICT; 3. Potentially reducing chances for deep-learning; 4. External music community or assessment do not support technology; 5. Possibly higher time demand for ICT integrated teaching.

- Part 2: Teachers’ beliefs about the new curriculum

Regarding the new curriculum documents, three teachers’ responses show they have a relatively high involvement level in the development stage and early-implementation stage of the curriculum. They participated in many activities relevant to the implementation of the new curriculum, provided feedback to the curriculum development agencies, and discussed the implementation plan with colleagues. On the other side, three teachers were in a lower involvement level. They did not participate in relevant events when hosted by their schools or professional organisations. In the personal aspect, their responses indicated they did not spend much attention on the new curriculum. In terms of the items and descriptions in the document, teachers generally believed the curriculum is general, flexible, practical, and informative. They also believed the curriculum sets a supporting role for ICT and is not too saturated with ICT. Some teachers’ responses also showed the document has some areas to be
improved and further assistance is needed when teachers are implementing the curriculum. Despite this, they have a positive attitude towards the new curriculum, they felt there will be no significant impact as a result of the curriculum document as many of them believe their teaching is similar to the descriptions in the curriculum and they are already achieving the goals.

- Part 3: Teachers’ barriers for future ICT integration and curriculum implementation

There are five barriers identified and reported by teachers: 1. Lacking sufficient quality training; 2. External music community and assessment do not support technology; 3. Financial limitation; 4. ICT reliability; 5. The inequivalent capability of students. Within the first barrier “Lacking sufficient quality training”, a personal aspect barrier is teachers lacking time for learning and investigating technology resources. To be keeping up with the fast developing technology resource and finding ways of best using a resource are challenges to a teacher in a restrained timeframe. Teachers’ own music learning background and ICT skills also affect their use of ICT. Besides the personal aspect barrier, school’s support and professional organisation’s training opportunity are important for ICT integration in the teachers’ view. Adding to the school and professional organisation’s support, the support from external music communities cannot be neglected especially for many instrumental background teachers. Technology Reliability as a barrier is closely relevant to another barrier—financial limitation. Unreliable hardware and software negatively affect teaching and learning, many teachers believe educational funding policy, student’s family background, and affordability are the main reasons for these barriers. At the end of interviews, teachers showed no intention of significantly changing their way of teaching. The main reason is they believe their current teaching methods are already carrying out the new curriculum and
achieving the goals of the curriculum. Many teachers are constantly changing methods to better educate students. Since many schools have an existing approach and staff for the current music programs, any significant change of the approaches, staffing, and programs will be difficult. At the current stage, they will use the curriculum document for reflection.
Chapter 5  Discussion

The purpose of this research was to reveal and understand teachers’ beliefs about technology integration, ICT component in the ACAM, and their anticipated difficulties in the future. The previous chapter elaborated teachers’ beliefs and concerns by presenting responses from each of the interview questions. The analysis identified many major factors of teachers’ beliefs and concerns. Further insights require synthesis and discussion with relevant theories and research programs. In this chapter, the findings are interpreted and examined with reference to relevant literature in order to identify reasons and relationships of teachers’ beliefs and concerns in the Queensland context. Section 5.1, 5.2, and 5.3 respectively correspond to three subsidiary research questions, elaborating three inter-related aspects of this research. Section 5.4 summarises the Discussion chapter.

5.1  Teachers’ beliefs about ICT integration in current teaching

Examining teachers’ use of ICT, beliefs about ICT in teaching, the roles of ICT and teacher selves, changes brought by ICT in teaching, and concerns about ICT, six teachers’ responses elaborate a view of the current situation of ICT in music classrooms. In general, the small sample of teachers interviewed revealed they could access a range of hardware and software fulfilling purposes of music production, musicianship development, facilitating learning progress. The use of ICT not only benefits student music learning and general capability development but also affects teachers reflecting and improving pedagogies and content knowledge. The concerns about ICT involves technological issues (e.g., reliability and compatibility), pedagogical concerns (e.g., inappropriate use of ICT), and institutional issues (e.g., music community’s support). Noticeably, many teachers expressed their adoption of ICT is predominantly based on the genuine musical learning needs and outcomes. They
expect using ICT in music learning activities for improving student general capabilities such as critical thinking and creativity. Teachers in the leadership positions are attempting to keep up with technology development and renovating their resources and teaching practices accordingly. In the meantime, they tend not to over rely on or over use technology in their teaching as music is a practical subject and technologies are best when acting as a supporting role.

Teachers’ choice of resources and ways of using a resource can reflect their general practice and beliefs about technology integration. According to the responses, teachers’ use of technology resources falls into Bauer’s (2014) categorisation of instructional software, including tutorial, practice, creativity, and games. One exception is the use of software for games in learning is not observed in the data, which might be affected by the small size of the sample or not being mentioned in interviews. Teachers reported their use of Internet resources for exposing students to further learning opportunities through various forms of resources and activities. Using Internet-based resources is also emphasised by Bauer (2014) by presenting the accessible and practical resources such as websites, blogs, Wikis, podcasts, social medias, and learning management systems. Regarding the ways of using ICT resources for music learning activities, the data shows most teachers primarily focus on using notational software for music production, especially composition and arrangement with Sibelius and GarageBand. Other ways of using ICT, such as using Piano Time for perceiving pitch and developing musicianship were mentioned as well. Bauer (2014) suggested a large number of ICT integrated music activity types, covering three aspects of creating music, performing music, and responding to music. There are more than twenty activity types serving purposes of creating music (i.e., improvisation and composition); thirty-seven activity types for performing music (i.e., vocal, instrumental, and reading and notating music); and
fourteen activity types for responding to music (i.e., listening, describing, analysing, and evaluating) (Bauer, 2014). Analysing the participating teachers’ use of ICT with the aforementioned activity types reflects that the participating teachers’ use of ICT resources have a relatively lower range of purposes and application types. Bauer’s (2014) comprehensive methods of ICT application in music education provide a framework for teachers further integrating ICT in music classrooms.

According to the CBAM SoC descriptions (see Appendix. C), the participants’ beliefs about ICT integration can be identified at a high level in the CBAM SoC descriptions. Overall, participants’ concerns can be reflected on the stages of concerns ranging from Stage 3 Management to the highest Stage 6 Refocusing. These stages respectively focus on the processes and tasks of using the innovation and the best use of information and resources (Stage 3); the innovation’s impact on students in his/her immediate sphere of influence (Stage 4); coordinating and cooperating with others regarding use of the innovation (Stage 5); exploring ways to reap more universal benefits from the innovation (Stage 6) (George, Hall, & Stiegelbauer, 2006). In the teachers’ responses, the above descriptions can be observed except the Stage 5 Collaboration which draws on coordination and cooperation with other teachers. As the interviews did not involve questions relating to coordination and cooperation between teachers, the data is not able to reflect teachers’ concerns in this aspect. Therefore, in terms of the concerns about ICT integration, the teachers show a high level in the CBAM SoC descriptions.

In the interviews, the participating teachers expressed positive attitudes, high willingness, and extensive adoption of ICT application in their current music teaching. They recognised the roles of ICT are to support genuine musical learning needs, pedagogical needs,
functional needs, and capability development needs. These facts are not aligning completely with previous research conclusions that teachers do not extensively use technology directly with students to facilitate learning outcomes (Bauer, 2014; Dorfman, 2008). In Dorfman’s (2008) research, only a small number of teachers regularly used a computer for writing or arranging music, creating music with a sequencer, recording live performances, burning CDs, accompaniment, and multimedia presentations. Comparatively, the participating teachers demonstrated meaningful ICT utilisation and positive beliefs about ICT integration in music teaching. This fact may indicate that after years of using ICT resources, teachers have started extensively and effectively using technology resources in music classrooms although the contexts in the previous research may have been different. In a comparable circumstance, this change can reveal a positive trend that teachers increased use of technology resources in a meaningful manner has developed. From this perspective, teachers’ use of technology in music teaching is developing towards extensive, meaningful, and effective ways of ICT integration. Their non-use of ICT is also based on specific pedagogical considerations and particular needs and should not be considered as an issue. Based on this, Bauer’s (2014) the notion of technology’s integration gap might be reduced. In other words, the instructional potential of technology has the potential to be realised in classrooms.

In the responses regarding teachers’ beliefs about their own role in ICT integrated music teaching, there are four themes that emerged and three of them match with the dimensions of Mishra and Koehler's (2006) TPACK model. The first theme, ensuring a good learning environment and ICT setup, matches the technology knowledge in the TPACK model. Ensuring a good learning environment and ICT setup referring not only to preparing the technology devices at a good condition for study but also an in-depth understanding of the function and benefits of the resource as well as the potential for the best music engagement.
The technology aspect of the TPACK model has a similar meaning that stands for a teacher’s knowledge and skills to be competent for operating technology devices. The second theme, pedagogically adopting, matches the pedagogical knowledge in the TPACK model. Mishra and Koehler (2006) describe pedagogical knowledge as,

Deep knowledge about the processes and practices or methods of teaching and learning and how it encompasses, among other things, overall educational purposes, values, and aims. This is a generic form of knowledge that is involved in all issues of student learning, classroom management, lesson plan development and implementation, and student evaluation. (p. 1026)

In the teachers’ beliefs of this research, two pedagogical aspects are important to technology integrated teaching. One is constructively introducing and demonstrating operational skills for ICT resources and the second is to provide opportunities to use ICT for the best music engagement. The two aspects are closely relevant to the notion of TPACK pedagogical knowledge in an ICT integrated context. The third theme, teacher’s own learning and upskilling, can be referred to the TPACK content knowledge as the fast developing music industry and resources require teachers to keep learning and study in-depth. This includes the knowledge in music technologies. Other than beliefs associated with the TPACK model, the teachers value their role in developing students’ general capability which is a new dimension in the Australian Curriculum. Many teachers expressed they do not only teach music but also impart higher level knowledge, thinking skills, and inspire students’ minds.

Teachers expressed five concerns about ICT integration: 1. Technology reliability and compatibility issues; 2. Student’s inappropriate use of ICT; 3. Reducing chances for deep-learning; 4. External music community or assessment do not embrace technology; 5. Possibly higher time demand for ICT integrated teaching. According to a common categorisation of technology integration barriers, these concerns are relevant to personal barriers, institutional barriers, and technological barriers (Buabeng-Andoh, 2012; Kafyulilo, Fisser, & Voogt,
In the meantime, a teacher’s pedagogical knowledge and capability are influential to his/her beliefs. Specifically, technology reliability and compatibility issues can be a form of technological barriers. The music communities’ support on technology can be regarded as an institutional barrier. Reducing chances for deep-learning, possibly higher time demand for ICT integrated teaching, and student’s inappropriate use of ICT tend more to be pedagogical issues which can be relevant to a teacher’s background, mind-set, and capabilities.

5.2 Teachers’ beliefs about the ACAM

In the second part of the interview, teachers’ participation in the activities relevant to the new curriculum showed two levels of involvement. The relatively higher involved teachers are mostly the heads of music departments and they have participated in meetings and trainings, whereas the lower involved teachers have not participated in formal activities about the new curriculum and have limited understandings about the curriculum. Noticeably, both higher and lower involved teachers believe the new curriculum document is generally well-written, flexible, practical, and informative. Teachers believe a good point about the new curriculum is it sets a supporting role to ICT, integrates ICT in many areas of music learning, and the curriculum is not too saturated with ICT. Nevertheless, they suggested many areas in the curriculum could be improved and assistance is needed while implementing, such as a more detailed plan and timeframe for teaching objectives. Many teachers expressed that their current teaching are achieving many objectives in the new curriculum since they are early adopters of technology and they are constantly changing their teaching methods for best teaching results.
From the observed data, teachers’ awareness and reaction to the new curriculum is at a stage of receiving more information, evaluating potential benefits, considering changes, and determining difficulties. According to the CBAM SoC framework, these reactions match the descriptions of Stage 1 Informational and Stage 2 Personal,

In Stage 1, the individual indicates a general awareness of the innovation and interest in learning more details about it. The individual does not seem to be worried about himself or herself in relation to the innovation. Any interest is in impersonal, substantive aspects of the innovation, such as its general characteristics, effects, and requirements for use. In Stage 2, the individual is uncertain about the demands of the innovation, his or her adequacy to meet those demands, and/or his or her role with the innovation. The individual is analysing his or her relationship to the reward structure of the organisation. Determining his or her part in decision making, and considering potential conflicts with existing structures or personal commitment. Concerns also might involve the financial or status implications of the program for the individual and, his or her colleagues. (George et al., 2006, p. 8)

The lower stages of concerns about the new curriculum indicate that teachers are at an early stage to adopt and implement the ACAM. A fact that only the teachers in the leadership positions have been actively involved in activities about the new curriculum reflects that many teachers’ opportunities of getting familiar with the new curriculum and discussing concerns are limited at the current stage. Teachers’ understandings of the new curriculum are merely based on the document rather than a comprehensive input and practical experience. Furthermore, since the curriculum has not been fully and practically implemented, difficulties in teaching planning, preparation, process, and post-teaching (practice and assessment) are not clearly identified. The factual impact of the new curriculum is not clear as well at this stage.

In this research, teachers’ responses towards the Australian Curriculum have a similar situation with Hartwig and Barton's (2006) research in Queensland where teachers were not eager to change what and how they were teaching in their music classrooms. Further research in Queensland also revealed that teachers expressed they would continue to deliver what they
believed to be a quality music programme and would not be significantly influenced by the change in curriculum (MacDonald, Barton, Baguley, & Hartwig, 2016). Hartwig and Barton (2006) state that the former Queensland music syllabi was primarily Kodály method based. A particular methodology does not fit all teachers’ philosophy, teaching style, and available teaching material as well as the school context. Meanwhile, teachers’ implementation of the curriculum were largely dependent on school administration’s support and determination (Kay Hartwig & Barton, 2006).

Reviewing the above mentioned research (Kay Hartwig & Barton, 2006; MacDonald et al., 2016) found that both teachers in the 2006 research and the present research have generally positive attitudes and comments about the new curriculum. However, teachers were reluctant to make changes to implement the new curriculums. Hartwig & Barton’s (2006) research shows many teachers have different philosophies and methodologies, whereas the present research has no evidence observed in this aspect. In Hartwig and Barton’s (2006) research, teachers’ factual implementation of the curriculum was driven by the school administration’s determination and support. Since the above research projects are comparable in terms of context, it may be able to be assumed that the school administration’s actions will be substantial in the actual implementation of the ACAM.

In this research, teachers’ negative aspects included a more detailed implementation plan was needed and the inappropriate wording in some of the music areas. These negative aspects were also identified and deemed as defects by a subject matter specialist in the Review of the Australian Curriculum: Final Report (Australian Government Department of Education, 2014). In the report, the specialist believes the curriculum design with a standardised and homogenised approach that all of the art forms are described in the same
terms and it is inappropriate. Moreover, the specialist has a similar view with a participating teacher that

The broad distinction between ‘making’ and ‘responding’ seems reasonable at first glance but as the arts curriculum develops into taxonomical detail such as viewpoints, questions, bands, content descriptions, content elaborations, and achievement standards it becomes increasingly vague. (Australian Government Department of Education, 2014, p. 214)

In the aspect of curriculum implementation, the specialist echoes a participating teacher’s opinions about lacking of guidance and a detailed plan of implementation, by stating,

“Descriptions of content and their elaboration are on the whole vague and differentiation and specification at various age points is very poor and so the curriculum provides a weak level of guidance for those teachers and schools most in need of it. (Australian Government Department of Education, 2014, p. 215)

Regarding the details of timeframe of teaching components, the teachers in this project identified concerns and this was also raised by the specialist,

There is no clear unambiguous indication in the curriculum of the amount of regular class time it is envisaged be spent teaching component parts of the arts curriculum. (Australian Government Department of Education, 2014, p. 214)

The negative aspects raised in the present research were recognised by the specialist in the review, indicating these concerns are common among teachers.

A noticeable fact within the responses is that teachers with less teaching history reported the negative aspects, whereas teachers with longer teaching history and at leadership positions have generally positive responses but have little intention of making changes.
Specifically, less-experienced teachers’ voices are mainly about “How” and “When” to implement the curriculum and the relevant details whereas the longer-employed teachers were concerned about the “What” and “Why” of the principles of the curriculum change. The more-experienced teachers in this research expressed that the existing music programs and staffing are mature and successful, making fundamental changes challenging and costly. Therefore, when a new change is impending, they holistically evaluate “why to change” and “what to change”, whereas less-experienced teachers were more concerned about their specific actions.

Consequently, the discussion above indicates that in the early stages, teachers’ concerns about ACAM are at low levels. Despite teachers holding positive attitudes towards the ACAM, their factual adoption and implementation of the ACAM are more likely to depend on school administration’s actions. Beside the satisfactory aspects of the curriculum, their negative aspects about the curriculum have been recognised and criticised in the review report of the curriculum. The difference in the length of teaching history assumes the aspects of concerns about the curriculum change are different.

5.3 Teachers’ barriers for future ICT integration in new curriculum

This section discusses teachers’ perceived barriers for ICT integration and their transition to the new curriculum. The barriers for teachers integrating ICT in the new curriculum music subject are reported as: 1. Lacking sufficient quality training; 2. External music community and assessment do not support technology; 3. Financial limitation; 4. ICT reliability; 5. Inequivalent capability of students. With Buabeng-Andoh's (2012)
categorisation of barriers, the reasons of these barriers can be categorised into personal reasons (e.g., Personal mind-set, lacking sufficient quality training), institutional reasons (e.g., external music community and assessment do not support technology, financial limitation), and technological reasons (e.g., ICT reliability). These barriers and the associated reasons can also be discussed in Ertmer’s (1999) two-group categorisation: First-Order Barriers and Second-Order Barriers. The first-order barriers refer to those obstacles that are extrinsic to teachers, such as equipment, time, training, and support. In Ertmer’s (1999) view, these barriers are easy to measure and relatively easy to eliminate once adequate factors (e.g., training, fund, resource) are provided. Although the first-order barriers relate to access, training and support, they can create a significant problem for teachers, schools and teachers that might be able to overcome with creative strategies (Ertmer, 1999).

In the present research, the first-order barriers are music communities’ support of using ICT, financial limitation, and ICT reliability. The barrier of external music communities’ support of using ICT is an institutional barrier and is associated with the environment and traditions of music education system. The purposes and forms of music ensemble competition (e.g., Eisteddfods) and individual music examination (e.g., AMEB) are to present and evaluate music learning outcomes. In many occasions, they are not the same as the general purposes and forms of classroom music education which serve for cultivating and developing general music knowledge, skills, and overall capabilities. In other words, external music community activities primarily draw on competition or assessment and do not significantly affect general day-to-day teaching and learning. These activities do not actually block the way of ICT integration in classroom music activities. How can teachers make better use of ICT in preparing music competitions and assessment should be considered differently from general classroom music ICT integration. As a result, external music community’s
support is not a focus of discussion about classroom music ICT integration. The participating teacher’s concern of this issue may be associated with her own instrumental background.

In terms of financial limitation, commonly presented as technology resource shortage or quality and functionality related issues, most participating teachers in this research did not report any serious issues caused by shortage of technology. Only one teacher who works at a relatively lower socio-economic status school (ICSEA 1017) expressed significantly about expectations of higher standard resources. Other teachers generally can access a range of industrial standard technology resources and show a moderate eagerness of more advanced resources. This fact shows the current available resources for classroom music teaching is generally sufficient for common uses. Echoing Ertmer’s (1999) opinion, Crawford’s (2009b) case study about adapting to ICT resource limitations reflects that schools and teachers can perform certain strategies to overcome resource shortage issues. Synthesising the responses in the present research with Ertmer (1999) and Crawford (2009b), the financial limitation’s influence on technology integration is relatively insignificant rather than seriously hindering teachers’ effective integration in classroom. On the contrary, many teachers may overestimate the importance of technology, and claim many pedagogical issues are caused by resource shortage. Admittedly, financial limitation has many other effects other than resource availability, such as technology training opportunity. It is also largely influenced by school and higher level administration, funding, and student backgrounds. However, financial limitation issues at the present context is not predominantly hindering technology integration in the aspect of resource availability. Consequently, financial limitation as a first-order barrier is not a significant barrier in this research.
Along with financial limitations are leadership support and technical support at the school level. Research shows school technology leadership is an important predictor of teachers’ use of technology in teaching (Anderson & Dexter, 2005). As a leader can influence financial and technical support to teachers using ICT, share vision with teachers, and plan for technology related changes, leadership support is influential for teachers to adopt technology (Buabeng-Andoh, 2012). In this research, issues about leadership on technology aspects were not reported by teachers whereas technical support for addressing ICT reliability and compatibility issues were raised by teachers. Firstly, teachers reported they have to spend considerable time on setting up suitable environments for teaching and learning, with a lack of technical support for teachers. Secondly, on the students’ side, they encounter technical issues on both hardware and software which need technical support as well. Though many issues are the result of a combination of technical issues and financial issues, technical support is essential for teachers to effectively integrate technologies in teaching.

Comparatively, the second-order barriers are more difficult to overcome which are typically rooted in teachers’ underlying beliefs about teaching and learning, and may not be immediately apparent to others or even to the teachers themselves (Ertmer, 1999). Ritchie and Wiburg (1994) believe the second-order barriers are less tangible as they are more personal and more deeply ingrained. Therefore, they believe “traditional perceptions of what teaching, learning, and how knowledge should look like are major limiting factors to integrating technology” (Ritchie and Wiburg, as cited in Ertmer, 1999). Teachers’ own music professional background, mind-set (or philosophy), time for investigation (or learning), and technology capability (or proficiency) are important to their use of technology in teaching. Furthermore, quality training opportunity in relevant areas are also influential as it
may change a teacher’s beliefs and skills on managing and using technology resources (Buabeng-Andoh, 2012).

Professional background is an important aspect related to teachers’ beliefs toward technology integration. Among the responses, a few teachers reported their past music learning experience did not involve intensive use of technology resources, and their teacher training program at university also did not include specific technology training components in music. They believe the traditions of classical music training and low availability of technology resources in their student period lead to their professional background lacking experience of musical and educational technologies. Under this influence, their pedagogical decisions may not involve intensive use of technology. Moreover, a senior teacher expressed that pre-service teachers in recent years received insufficient training in pedagogy and technology. During their career, the absence of specific technology training limits the development of music teachers’ technological knowledge in music teaching as well as pedagogical practices (Bauer, 2013). Bauer and Dammer’s (2016) recent survey of technology training in music teacher education programs also reflects a low training level of technology for music pre-service teachers. Though universities provide courses for education majors and music majors, pre-service teachers’ preparedness to integrate technology into music teaching is low, indicating there is room for improvement in preparing music teachers to effectively utilise technology to support musical learning (Bauer & Dammers, 2016). Similarly, Haning’s (2016) research also indicates technology instruction is not often integrated throughout pre-service music teachers’ degree programs. Forty-three percent participating teachers believed their teacher education program had not prepared them to use technology successfully. Despite Bauer and Dammer’s (2016) and Haning’s (2016) studies have different research contexts with the present research, all research projects reflect that
teachers’ professional background and study experience are critical to a teacher’s self-efficacy and preparedness of technology integration. Therefore, professional background is a critical factor to a teacher’s beliefs about technology, and might become a barrier in certain circumstances.

Another barrier in relation to teachers’ beliefs is quality training opportunity. Since teachers’ professional background sets a foundation of technology utilisation in teaching, quality training opportunity offers further development for in-service teachers. Although lacking training opportunity is usually a first-order barrier, it has a long-lasting effect on a teacher’s beliefs about technology integration. Research indicates professional development programs not only deliver knowledge and skills for use of technologies but also may change one’s beliefs towards technology, including willingness and self-efficacy about technology integration, and advantages of technology resources (Hew and Brush, 2007; Keengwe & Onchwari, 2008, who is cited in Buabeng-Andoh, 2012). Therefore, training opportunity and teachers’ beliefs about technology integration can be discussed as a second-order barrier. In this research, teachers commented they appreciated the opportunities of professional development programs, which are informative and fruitful. However, as one teacher stated, “with the constraints of teaching, the demands on teachers’ daily life, sometimes those sessions are skimmed over or you go to a PD session to learn about that and it's too above the teachers who are there (Steven)”. This response reflects that the content and form of a professional development session may not fulfil a teacher’s factual demand of technology integration training. Suitable training opportunity, in terms of the content and form specifically designed for the teacher and addressing teaching difficulties, is greatly demanded for better technology integration and learning outcomes. Insufficient times of training may reduce the chance for teachers to gain knowledge and skills on technology. The relevance of
training content also influences a teacher’s expectation and willingness to further participate. Both the amount and quality of training opportunities will pose influences on teachers’ beliefs and practices relevant to technology integration. Since technology develops at a fast pace, lacking sufficient and in-demand training can be a critical barrier for teachers.

Regarding teachers in the curriculum transition, Section 5.2 discussed the general attitudes and negative aspects about the new curriculum. According to the CBAM analysis, teachers are at the early stages of adopting the curriculum change. They are at the stage of making clear understanding of the change, and not yet fully convinced to implement the ACAM. Though teachers at different positions may examine the new curriculum at different perspectives, they generally accept the roles and descriptions about ICT integration in the curriculum document. Moreover, teachers’ primary reasons of using ICT (i.e., fulfil genuine musical learning needs, pedagogical needs, functionality needs, and general capability development needs) are insignificantly affected by curriculum requirements. The implementation of the new curriculum will not significantly affect their adoption of technology. As to the curriculum implementation per se, by addressing the negative aspects and continuing the implementation procedure with school administration level support, teachers’ concerns are expected to be relieved and their understandings of the new curriculum will increase through school level communication, professional development sessions, and practical teaching experience.

5.4 Summary of Discussion

In this chapter, teachers’ beliefs about ICT integration in current teaching, beliefs about the new curriculum, and future barriers of effective ICT integration and curriculum
implementation are discussed in three sections. In the first section, the discussion of the present research and the relevant research indicates teachers can access a range of technology resources and employ the resources in various activities. However, the range of technology-integrated activity types is relatively low. The CBAM analysis illustrates the participating teachers’ beliefs are at high stages about technology adoption. In comparison with previous research, the participating teachers demonstrated positive attitudes, high level willingness, and extensive adoption of ICT in current teaching, presuming teachers’ significant increase of meaningful use of ICT resources and higher level knowledge about ICT resources. In regards to teachers’ belief of their own role in technology integrated teaching, their responses fitted in the TPACK framework in three aspects. Ensuring good learning environment, pedagogically adopting, and up-skilling their content knowledge reflect they have a thoughtful understanding about their roles. Finally, they raised their concerns about technology integration which fall into categories of personal, institutional, and technological barriers.

In the second section, although teachers in different positions had different levels of involvement in curriculum related events, all teachers demonstrated a positive attitude about the content of the curriculum. They also appreciated that the curriculum set an appropriate role of ICT in teaching. However, the CBAM analysis shows their concerns are at low stages about the curriculum change. Lacking of opportunity to be familiar with the new curriculum, satisfaction of current technology, and lacking of school administration’s support are possible reasons that many teachers show no immediate intention to implement the new curriculum. Teachers’ negative aspects about the curriculum include a detailed implementation plan and inappropriate wording in music areas. In the review of the curriculum, these two problems are also criticised by a subject specialist who calls for attention and change. The difference in
the length of teaching history assumes the aspects of concerns about the curriculum change are different.

The third section elaborates the most significant barriers of technology integration in the present context. Through the view of Ertmer’s (1999) theory, the first-order barriers among the participating teachers are music communities’ support of using ICT, financial limitation, and ICT reliability, and the second-order barriers are teacher’s professional background (i.e., music education traditions, university teacher education), and personal beliefs and knowledge which due to insufficient professional development opportunity. Through discussion, the concern about music communities’ support is insignificantly relevant to classroom music teaching, and it does not block the ways of classroom technology integration. Similarly, financial limitation does not affect resources accessibility significantly in the participating teachers’ schools. The demand of technical support was raised in both teacher’s and student’s aspects which is believed to be essential for effective technology integration. As to second-order barriers, the first aspect is music teacher’s previous music learning experience and technology training during teacher education programs. Teachers believed the traditions of classical music training and low availability of technology resources in their student period caused their professional background lacking experience of musical and educational technologies. The second aspect reflects the content and form of a professional development session may not fulfil a teacher’s factual demand of technology integration training. Sufficient and suitable training opportunity is desired to help teachers strengthen teaching knowledge, skills, and keep them up-to-date with the fast developing technologies. Finally, as teachers are at early stages of adopting the new curriculum, addressing their negative aspects and increasing school administration’s support are expected to gain their attitudes and support towards the implementation of the new curriculum.

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Chapter 6  Conclusion

The purpose of this research was to examine and explore Queensland secondary school music teachers’ beliefs about technology integration and the Australian Curriculum: The Arts-Music, and their barriers for future technology integrated teaching and curriculum implementation. This research employed a qualitative case study approach and collected data through one-to-one semi-structured interviews. Six teachers from six schools in South-East Queensland participated in this research. The data was examined by using inductive thematic analysis method and the dimension of Stage of Concerns in the CBAM framework. Through examining teachers’ responses individually and collectively, the data depicted insights of teachers’ beliefs in various aspects concerning general use, perceived advantages, barriers, and influential factors of technology as well as their stages and concerns about the new curriculum. Synthesising the findings with relevant theories and research programs, teachers’ beliefs about technology integration and new curriculum implementation as well as their perceived future barriers were identified. The major factors and their relationships were examined to illustrate the reasons and influences which could be used for improving strategies for technology integration and curriculum implementation. The following sections debrief the findings and present limitations and implications of this research.

6.1  Respond to Research Questions

The main research question in this research is:

ICT integration in the new Australian Curriculum: The Arts – Music: What are the beliefs of some secondary school music teachers in Queensland?

The subsidiary research questions are:

1. What are teachers’ beliefs of ICT integration in their current teaching?
2. What are teachers’ responses to the content descriptions regarding technology integration in the ACAM?

3. What are teachers’ perceived barriers for technology integration in their future teaching?

6.1.1 Sub-question 1: What are teachers’ beliefs of ICT integration in their current teaching?

Through investigating Queensland secondary school music teachers’ beliefs about ICT integration in aspects of resources, usage, experience, purposes, roles, and concerns, the emerged themes in teachers’ responses illustrated the participating teachers are at high stages of concerns about technology adoption. The result achieved the first research objective that was to reveal the current status of ICT integration in classroom music teaching in the context of Queensland secondary schools (Year 7 to Year 10). The revealed aspects of beliefs provided a comprehensive description for understanding the current situation of technology integration in classrooms and teachers’ subjective views. It also offered a foundation for further examining other parts of this research. In regards to research problems in this research, the result disconfirms the research problem 2 that many music educators don’t extensively use technology directly with students to facilitate learning outcomes; and research problem 3 that there are many misunderstandings and ineffectual uses of technology in current music teaching. The data demonstrated teachers used technology resources extensively in music teaching, particularly many units are heavily technology resource based. Meanwhile, their adoption of technology has thoughtful purposes and process, and emphasis on learning experience and outcome. Through examining teachers’ descriptions about the roles of technology resources and teachers’ own roles in technology integration, they have a critical understanding of the roles that ICT resources are best serving as a supporting role in music teaching and learning because music is a practical subject. Teacher selves are to make best
use of ICT resources rather than over-rely on ICT resources. This fact is against the third research problem although misunderstandings and ineffectual uses of technology may exist in some way which depends on the philosophy and methodology of evaluation. In discussion with relevant theories and research programs, this research finds the range of technology-integrated activity types is relatively low in Bauer’s (2014) framework which contains various activity types serving three aspects of music learning. The CBAM analysis shows teachers are at high stages of concerns about technology integration. Their positive attitudes towards technology assume a significant increase in knowledge and skills of technology adoption. Teachers’ reflection about their roles matches all dimensions of TPACK framework and the General Capability dimension in the Australian Curriculum, indicating teachers’ thoughtful understanding about their roles in technology integrated music teaching. Their concerns about technology integration fall into Buabeng-Andoh’s (2012) categorisation about barriers, confirming the existence of technology integration barriers in Queensland context.

6.1.2 Sub-question 2: What are teachers’ reactions to the content descriptions regarding technology integration in the new Arts Curriculum?

On the subject of teachers’ beliefs about the new curriculum, this research investigated teachers’ involvement in relevant activities, their subjective thoughts about the content, their attitudes, and potential impacts. The result indicates teachers in different positions have two levels of involvement. Teachers on leadership positions have participated in various forms of curriculum related activities whereas other teachers participated less and know less about the new curriculum. The CBAM analysis indicates all teachers’ concerns about the curriculum change were at low stages. The commonality in teachers’ responses is they have generally positive comments toward the curriculum document. Moreover, they believe the curriculum appropriately sets ICT a supporting role and is not too saturated with
ICT in music teaching. Negative areas on a detailed implementation guideline and wording in music areas were reported by teachers. Despite the curriculum being generally well-written, teachers show no immediate intention to implement the curriculum as they believe their current teaching is fulfilling the goals in the curriculum and it is difficult to change the existing music programs. These findings can generally fulfil the second research objective that to understand teachers’ beliefs about ICT integration in the impending curriculum change. The finding of low willingness to adapt to the new curriculum confirmed the first research problem that many teachers may not be willing to change their existed teaching methods and content, and adapt to a new curriculum (Hartwig & Barton, 2006; Somekh, 2008). In discussing teachers’ low willingness of accepting the new curriculum, the school administration’s support and action were assumed as a substantial factor that facilitates teachers’ factual implementation of the new curriculum. In addition, teachers’ dissatisfaction about the implementation guideline and wording in some music areas were recognised by a specialist in the national review of the Australian Curriculum.

6.1.3 Sub-question 3: What are teachers’ perceived barriers for technology integration in their future teaching?

In the investigation teachers’ perceived barriers for future technology integration, five barriers were reported by teachers: 1. Lacking sufficient quality training (personal background and professional development opportunity); 2. External music community and assessment do not support technology; 3. Financial limitation; 4. ICT reliability; 5. The inequivalent capability of students. According the nature of the barriers were analysed in groups of personal, institutional, and technological barriers. The analysis shows the barriers are inter-related and challenging a teacher’s capability to overcome all difficulties. Adding to the elaboration on barriers, teachers again expressed that they acknowledged the curriculum’s encouragement of technology integration, however, their teaching methods are constantly changing for the best music teaching outcomes regardless of the curriculum. Significant
change was identified as difficult for existing music programs. With Ertmer’s (1999) theory, the first-order and second-order barriers that are hindering teachers’ technology integration in present research context were discussed. Further discussion on first-order barriers identified that music communities’ support and financial limitation are not critical barriers whereas leadership support and technical support at schools can pose significant influence on teachers’ technology integration and student experience of technology assisted learning. As to second-order barriers, which were believed to be more influential, more difficult to overcome, and less tangible (Ertmer, 1999; Wiburg, 1994), this research found Queensland teachers’ professional background and professional development opportunity are significant factors influencing teachers’ beliefs and capabilities about technology integration. The responses indicated the traditions of classical music training and low availability of technology resources in teachers’ student periods lead to their professional background lacking experience of musical and educational technologies. University teacher education programs lack provision of sufficient training on technology integration also limited the development of knowledge and skills in technology. These factors are important to a teacher’s self-efficacy and preparedness about technology integration. On another aspect, lacking of sufficient and in-demand professional development opportunities reduce the chance of a teacher to update knowledge and skills which can be influential to his/her expectations and willingness of further training and adoption. Though professional development opportunity is a form of first-order barrier, it is impactful to a teacher’s beliefs of technology integration. The findings from the analysis and discussion are indirectly relevant to the research problems. However, they fulfilled the third research objective that was to understand teachers’ anticipated difficulties in implementing the new Arts Curriculum, particularly using ICT. The findings extended the knowledge about technology integration issues in Queensland context.
6.1.4 Summary and Conclusion

This research investigated Queensland secondary music teachers’ beliefs about technology integration, the *Australian Curriculum: The Arts-Music*, and their perceived barriers for future technology-integrated music teaching. By analysing the interview responses, teachers’ beliefs about technology integration were illustrated. Positive attitudes, high willingness, extensive and purposive use of technology resources show teachers are at high stages about technology adoption in the CBAM framework. Nevertheless, in regards to the ACAM, they had generally positive responses about the curriculum document but shown no immediate intention to implement. The discussion assumes the reason is that teachers are at early stages of familiarity with the curriculum. They are lacking of school administration’s support, and considering a practical implementation plan. It is also difficult for many schools to substantial change the existing music programs without significant demands. The research analysed the barriers of future technology integration in the present research context. It assumed music communities’ support and financial limitation are not evidential barriers whereas leadership support and technical support are important first-order barriers. More importantly, teachers’ beliefs about technology integration are closely associated with their previous study experience and the quality of current professional development opportunities.

6.2 Limitations

There were several limiting factors in this research. In qualitative case study approach, it is unlikely to be representative of all Queensland music teachers in general. The small sample size (N=6) of participating teachers limited the data thickness and sample diversity. Since all participants work at south-east Queensland, teachers in other regions were not represented, especially teachers who work at low socio-economic and rural areas. Although teachers were asked to check and verify their responses while transcripts were available, the one-time only interview limited the chances that teachers
could provide more responses and add to previous statements. Only using the sole interview form of data collection is relatively limiting rather than employing other data forms such as observation. The research partially adopted the Concerns-Based Adoption Model (CBAM). Only the Stages of Concerns dimension was adopted for interview question designing and data analysing. The absence of Level of Use dimension which reflects teachers’ actual practice level affected objectivity of the data and limited further insights of teachers’ beliefs. The reliability of research might be affected by using thematic analysis as personal interpretation of data can influence the outcome. (Braun & Clarke, 2006). In addition, thematic analysis has a strength on finding significant patterns or characteristics. However, it may miss insignificant data which might affect the outcome. (Guest, 2012).

6.3 Implications and Recommendations

This research illustrates various factors concerning teachers’ beliefs about technology integration, curriculum implementation, and barriers for technology integration. It also confirms and disconfirms the existence of many issues, and develops relevant knowledge in Queensland context.

For teachers, the findings indicate many music teachers received insufficient technology training during their student period in either music study or teacher education programs. The professional development opportunities for in-service teachers may not accommodate the actual needs in classroom and lesson preparation. Therefore, it is imperative for teachers to examine their knowledge about technology integration and to consider plans for improvement. The CBAM framework can be used for assessing a teacher’s
stages of concerns and level of use about technology integration. Moreover, the TPACK model can be a general framework when used for determining exact dimension for improvement among technological, pedagogical, and content knowledge. By understanding teachers’ own status of technology knowledge, they are able to reflect and improve teaching effectively. Teachers’ participation in professional development activities will be more purposive and effective. With these actions, teachers could be more confident to overcome personal barriers. As the CBAM and TPACK are universal to most subjects, teachers in other subjects could also use them for improving teaching.

For schools and professional organisation leaders, in the present research context, teachers demonstrated high level of technology adoption and low level of curriculum adaptation. Regarding technology integration, the barriers identified in this research, such as lacking sufficient and in-demand professional development opportunity, school leadership support, and technical support, require leaders to clarify local school barriers and initialise plans for improvement. Ertmer’s (1999) theory can be used for determining whether the barriers need personal aspect efforts or institutional and technological aspects improvement. As to the new curriculum implementation, since it is at the early stages, leaders are recommended to ascertain teachers’ difficulties, analyse their beliefs; initialise local school plans to guide the implementation; and communicate with the curriculum agencies in order to implement the curriculum smoothly, effectively and timely.

For curriculum agencies and education researchers, as this research identified influential factors of technology integration and curriculum implementation in the Queensland context, the confirmed, disconfirmed, and developed knowledge can apply to other aspects. In the technology integration aspect, teachers need further guidance on
integration strategies and resources to better fulfil the intended goals. In the curriculum aspect, as the results indicate teachers are dissatisfied with some of the content in the document and are seeking support to implement, modifications on the curriculum document and guidance on practices are required. Further research on this topic is recommended to fully utilise the CBAM framework and TPACK framework to assess technology integration and curriculum implementation with a larger sample size and more diverse participants.
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Appendices

Appendix A. Interview Questions Sample

Demographic information to be collected
   o How long have you been a music teacher?
   o What subjects do you teach?
   o What is your average teaching load per week?
   o What is the average size of the class?

Interview Questions
1. What are teachers’ beliefs of ICT integration in their current teaching?
   a) What technology resources do you use for your music teaching?
   b) Could you describe how you use an ICT resource in teaching? Or
   c) Could you describe an example of how you use technology to teach a lesson?
   d) What is the importance/role of using ICT in your current teaching?
   e) What do you think about your role in student’s ICT mediated learning experience?
   f) Do you have any concerns about ICT integration in music teaching?

2. What are teachers’ reactions to the content descriptions regarding technology integration in the new Arts Curriculum?
   g) What have you experienced about the new Arts Curriculum (e.g., training, meeting)?
   h) What do you think about the new Arts Curriculum and its descriptions relating to ICT?
   i) How do you think the curriculum documents will impact on your teaching? Especially the ICT aspect.
   j) What do you see as the positive and also negative aspects of the new curriculum?
   k) Why do you believe this?

3. What are the teachers’ perceived barriers of technology integration in their future teaching?
   l) What barriers can you identify that may affect you integrating ICT in your teaching the new curriculum?
   m) In your opinion, what are reasons of these barriers?
   n) Will you change your current teaching strategies to meet the needs of the new curriculum?
   o) If yes, how will you change your teaching?
Appendix B. Content Descriptions relevant to ICT in Year 7-10 Music Subject

Year 7 and 8
8.2.1 Using technology to manipulate specific elements such as pitch and timbre to create intended effects in composition or performance.
8.2.3 experimenting with technology to sequence and combine ideas to enhance intentions in compositions and performances.
8.4.2 selecting, combining and manipulating sounds using technologies to create, develop and record music ideas.
8.4.3 exploring technology as a tool for creating, notating, recording and sharing music ideas.
8.4.6 using style-specific notation software to record compositions.

Year 9 and 10
10.2.1 manipulating sound sources and technology to suggest or replicate style.
10.2.3 creating symbols and using varied traditional and invented notation and technology to communicate how they used the elements of music in composition.
10.3.4 recording and evaluating performances using digital technologies, for example, listening to a recording of their own performances and identifying areas for improvement.
10.4.4 exploring and manipulating combinations of electronic and acoustic sounds to create new works, using technology as a composition tool and sound source.

(Extracted from Australia Curriculum: The Arts-Music, 2013, p.104-110)
Appendix C. The stages of concern about an innovation

<table>
<thead>
<tr>
<th>IMPACT</th>
<th>TASK</th>
<th>SELF</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Refocusing</td>
<td>The individual focuses on exploring ways to reap more universal benefits from the innovation, including the possibility of making major changes to it or replacing it with a more powerful alternative.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Collaboration</td>
<td>The individual focuses on coordinating and cooperating with others regarding use of the innovation.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Consequence</td>
<td>The individual focuses on the innovation’s impact on students in his or her immediate sphere of influence. Considerations include the relevance of the innovation for students; the evaluation of student outcomes, including performance and competencies; and the changes needed to improve student outcomes.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Management</td>
<td>The individual focuses on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, and scheduling dominate.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Personal</td>
<td>The individual is uncertain about the demands of the innovation, his or her adequacy to meet those demands, and/or his or her role with the innovation. The individual is analyzing his or her relationship to the reward structure of the organization, determining his or her part in decision making, and considering potential conflicts with existing structures or personal commitment. Concerns also might involve the financial or status implications of the program for the individual and his or her colleagues.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Informational</td>
<td>The individual indicates a general awareness of the innovation and interest in learning more details about it. The individual does not seem to be worried about himself or herself in relation to the innovation. Any interest is in impersonal, substantive aspects of the innovation, such as its general characteristics, effects, and requirements for use.</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Unconcerned</td>
<td>The individual indicates little concern about or involvement with the innovation.</td>
<td></td>
</tr>
</tbody>
</table>

(George et al., 2006, p. 8) Chart republish permitted by American Institutes for Research