Teachers’ perspectives about implementing ICT in music education

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This thesis is submitted in fulfilment of the requirements of the degree of Doctor of Education in the School of Education at Griffith University, Queensland.
Abstract

This research was incited by the release of the Prep to Year 10 (P-10) Australian Curriculum which included the significant feature of Information and Communication Technology (ICT) both as an independent subject and as a subsection of each subject within the Australian Curriculum. This research focuses on the implementation of ICT in music education, which is one of the five subject areas within the Arts Curriculum.

The purpose of this research was to investigate the lived experiences and perspectives of classroom music teachers throughout Queensland and to gain an insight into the organisational practices that positively and negatively influence the implementation of ICT in music education. Classroom music teachers were deliberately chosen to participate in this research due to their exclusive knowledge belonging to the specialist subject area of music education. The timing of this research occurred one year after the scheduled implementation of the Australian Curriculum: The Arts – music subject. This delay allowed a year for classroom music teachers to experience the curriculum and establish ideas and resources they require to deliver the curriculum.

This mixed methods research was conducted using explanatory sequential mixed methods, which were used to gather music teachers’ perspectives regarding issues such as, but not limited to: availability of ICT resources, ICT support, teacher confidence, current teaching practices and the provision of professional development. Following the analysis of the quantitative survey data, a number of qualitative semi-structured interviews were conducted to further investigate the identified themes, to provide a deeper understanding of the practical issues and ensure triangulation.

The data revealed that classroom music teachers perceived their attempts to implement ICT in music education programs were significantly inhibited due to the lack of accessibility to adequate ICT resources, ICT funding and ICT support. These issues forced classroom music teachers to favour resources based on availability, reliability and familiarity which limited
pedagogical methodologies to whole class learning activities, contrary to the development of ICT proficiencies stated in curriculum documents. Although classroom music teachers were held responsible and accountable for the delivery of the Australian Curriculum, they were subject to organisational practices and decision making by School Leadership within local schools. Local context decision making was found to significantly contribute to the inadequate supply of resources necessary to support the implementation of ICT in music education and directly determined an inequitable delivery of music education throughout Queensland.
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" (Griffith HDR guideline requirement).

This thesis contains my original work. Assistance contributed by others to this thesis has been clearly stated within the text, including participant contributions, significant technical procedures and survey assistance, survey design, statistical assistance, data analysis, editorial advice and any original or research referenced with this thesis. I acknowledge that copyright material contained in my thesis remains the intellectual property of the author and copyright permission has been granted by the copyright holder to reproduce material in this thesis.

The content of this thesis is the result of work solely conducted since the commencement of my higher degree research candidature and does not contain work submitted for the award of any other degree or diploma in any university or tertiary institution.

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**Acronyms and abbreviations**

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<td>ABRSM</td>
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<tr>
<td>ACARA</td>
<td>Australian Curriculum Assessment and Reporting Authority</td>
</tr>
<tr>
<td>AITSL</td>
<td>Australian Institute for Teaching and School Leadership</td>
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<tr>
<td>AMEB</td>
<td>Australian Music Examinations Board</td>
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<tr>
<td>ANCOSA</td>
<td>Australian National Council of Orff Schulwerk Association</td>
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<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
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<tr>
<td>ANZCA</td>
<td>Australian and New Zealand Cultural Arts</td>
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<tr>
<td>BCE</td>
<td>Brisbane Catholic Education</td>
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<tr>
<td>BYOD</td>
<td>Bring Your Own Device</td>
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<tr>
<td>C2C</td>
<td>Curriculum to Classroom</td>
</tr>
<tr>
<td>CAI</td>
<td>Computer Assisted Instruction</td>
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<td>CAL</td>
<td>Computer Assisted Learning</td>
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<tr>
<td>CE:P-6</td>
<td>Catholic Education: Prep to Year 6</td>
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<tr>
<td>CE:7-10</td>
<td>Catholic Education: Year 7 to Year 10</td>
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<tr>
<td>DEST</td>
<td>Department of Education, Science and Training</td>
</tr>
<tr>
<td>DET</td>
<td>Department of Education and Training</td>
</tr>
<tr>
<td>DETE</td>
<td>Department of Education, Training and Employment</td>
</tr>
<tr>
<td>EQ:P-6</td>
<td>Education Queensland: Prep to Year 6</td>
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<tr>
<td>EQ:7-10</td>
<td>Education Queensland: Year 7 to Year 10</td>
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<tr>
<td>F-10</td>
<td>Foundation to Year 10</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IE:P-6</td>
<td>Independent Education: Prep to Year 6</td>
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<td>IE:7-10</td>
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<tr>
<td>IPA</td>
<td>Interpretative Phenomenological Analysis</td>
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<tr>
<td>KMEIA</td>
<td>Kodály Music Education Institute of Australia</td>
</tr>
<tr>
<td>MCEETYA</td>
<td>Ministerial Council for Education, Employment, Training and Youth Affairs</td>
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<tr>
<td>NAPLAN</td>
<td>National Assessment Program – Literacy and Numeracy</td>
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NRSME  National Review of School Music Education
OECD  Organisation for Economic Cooperation and Development
OSHC  Out of School Hours Care
P-6  Prep to Year 6
P-10  Prep to Year 10
QSA  Queensland Studies Authority
SPSS  Statistical Package for the Social Sciences
STEM  Science, technology, engineering, and mathematics
TALIS  Teaching and Learning International Survey
QCT  Queensland College of Teachers
Trinity  Trinity College London
1:1  One-to-one ratio relationship
7-12  Year 7 to Year 12
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Publications during candidature

Journal Publications


Keywords

Music education, Information and Communications Technology (ICT), Australian Curriculum, Classroom music teachers, School Leadership, Queensland, lived experiences, Mixed Methods, Explanatory Sequential Mixed Methods, pragmatism, Interpretative Phenomenological Analysis (IPA).
Chapter 1: Defining the research

1.1 Introduction
This research aims to address a gap in the current body of literature by investigating the perceptions of classroom music teachers throughout the State of Queensland, with regard to the organisational practices which influence the implementation of Information and Communications Technology (ICT) in music education. It specifically explores the implementation and deployment of ICT resources, the associated confidence required to effectively implement and deploy ICT in music education programs in Queensland, by exploring if classroom music teachers have access to ICT resources and the knowledge necessary to implement ICT within their music programs. Since 2016, it has been a professional requirement for classroom music teachers to implement ICT in their music education programs, but based on personal experience, this professional expectation is problematic without access to ICT resources. This research seeks to ask classroom music teachers throughout Queensland what ICT resources they have been given access to by their schools and if they feel they have the necessary knowledge and confidence to include ICT in their music programs. This research constructs a realistic picture of how teachers feel about implementing ICT and the practical challenges they face whilst trying to fulfil this professional obligation.

1.2 Background information
The profound influence of ICT is undisputed. The extensive global utilisation of ICT within society can be seen in the public’s adoption of mobile phones, social media and the extensive reliance on internet within businesses and homes which has led to the installation of NBN in Australia. Motivated by the economic needs of the future global market (Organisation for Economic Co-operation and Development (OECD), 2019), education has embraced this wave of technology to address the ICT needs of students now and in the future, the Australian Government has responded to this technological growth by incorporating ICT within the 2012 Australian Curriculum as an independent subject, as well as including ICT as a subsidiary element within every curriculum subject. The Australian Curriculum Assessment and Reporting
Authority (ACARA) focuses on ICT inclusion and is intended to facilitate the development of ICT proficiencies of students (ACARA, 2012b), so that students may “participate in a knowledge-based economy...[with] the knowledge, skills and confidence to make ICT work for them at school, at home, at work and in their communities” (Australian Curriculum Assessment and Reporting Authority (ACARA), 2010b), by engaging in skills which allow them to “be empowered within a technologically sophisticated society now and into the future” (ACARA, 2010b). This is to enhance the employability prospects of students within the current society and as technological demands evolve over time, whilst simultaneously supporting the economic growth of Australia and Australia’s position within the global society.

To promote ICT proficiency in education, it is reasonable to suggest that students and teachers require accessibility to ICT resources in adequate class quantities equivalent to one student per one device ratio (1:1). Teachers also need to foster confidence in their own ICT abilities through the accessibility of professional development to extend their ICT skills. The implementation of ICT in music education places classroom music teachers at the centre of an ongoing tug-of-war. Differences between curriculum policy ideals and the reality of teacher registration authorities’ expectations to achieve ICT implementation in music education, signifies a gap that exists between policy and reality.

In order to produce a national standard of music education, the implementation of the music syllabus commenced in 2016. The Australian Curriculum: The Arts-music subject included the subsidiary requirement of implementing ICT within music education. Consequently, classroom music teachers have been entrusted with the responsibility to implement the music subject since that time, as specified in educational policy documents known as professional standards and accountabilities (Australian Institute for Teaching and School Leadership [AITSL], 2011). Professional standards have been constructed as an organisational strategy to motivate classroom music teachers to implement the curriculum in their music education programs according to curriculum documents (AITSL, 2011). This means that teachers are professionally responsible for the implementation of ICT in music programs, irrespective of whether school
leadership has provided adequate quantities of appropriate ICT resources. For the purpose of this research the term ‘adequate quantities’ refers to: the number of devices within each class that allows every student to individually engage in effective hands-on learning, allowing every student to use a device in an engaging manner at an individual pace without interruption from other students due to the sharing of a touch screen, whilst avoiding time wastage caused by alternating and waiting for other students to use the device. Ideally an adequate quantity requires a 1:1 student to device ratio. The term ‘appropriate ICT resources’ refers to Apple or Windows devices that are capable of running software which will support student learning relevant to music education, for example iPads to run Garage Band¹.

1.3 Relevance of this research

The relevance of this research is in its timing. This research investigation was deliberately timed to collect data in 2017, one year after the scheduled implementation of the Foundation to Year 10 (F-10) Australian Curriculum: The Arts-music subject that commenced in 2016. F-10 is also referred to as Prep-Year 10 (P-10) in Queensland. This timing allowed classroom music teachers one calendar year after the scheduled implementation, to establish practices involving the inclusion of ICT in their music programs, to ascertain the itinerary of ICT resources available to the music subject and identify school practices that construct obstacles inhibiting the implementation of ICT.

The collection of research data during 2017 focuses on the perceptions and lived experiences of classroom music teachers, which are important to the construction of a snapshot highlighting the current accessibility of ICT resources available in music classrooms in Queensland. This research investigation aims to explore the perceptions of classroom music teachers in an attempt to uncover the practical aspects and limitations of organisational practices experienced when teaching classroom music in Queensland schools. Through their lived experiences, classroom music teachers will offer valuable insight, as direct witnesses to those organisational practices which directly or indirectly influence the implementation of ICT in music education.

¹ Garage Band - Apple App, turns your iPad and iPhone into a collection of touch Instruments and a fully-featured recording studio to create loops, multi-track pieces, sound scapes.
Teachers’ perceptions will be considered valuable in identifying existing gaps between curriculum policy documents and the implementation of curriculum through ICT in music education.

1.4 Contribution of this research

This research contributes to the corpus of literature, by investigating if classroom music teachers have access to ICT resources and the knowledge necessary to implement ICT within their music programs. This focus is an area that has been bypassed within the current literature. A review of the existing body of literature has found that considerable research assumes that classroom music teachers have access to allocated and suitable ICT resources and strives to assist teachers by outlining strategies for applying ICT within the classroom (Bull & Kjellstrom, 2013; Cain, 2004; Chan, 2010; Dede & Richards, 2012; Hernández-Bravo et al., 2016; Krauskopf et al., 2012; Power, 2019; Southcott & Crawford, 2011; Stevens, 2018; Wardrobe, 2016; Wastiau et al., 2013; Whelan, 2008; Wong, 2012). The assumption that classroom music teachers have ICT resources available for use within the music classroom has created a gap in the literature. This research strives to address this gap by investigating the degree of provision and availability of ICT resources within music classrooms and not just assume resources have already been provided.

Undertaken in response to the implementation of ICT in music classrooms throughout Queensland, the justification of this research is based on the need for employers to provide ICT resources for classroom music teachers to do the work they are expected to perform. The implementation of the music syllabus represents a gap between curriculum learning outcomes and the practical application of the curriculum, with particular regard to the provision of ICT resources for music education. This research acknowledges the need to increase awareness of the challenges involved in the practical application of curriculum and in particular, this research investigates if classroom music teachers have been provided with the necessary ICT resources to fulfil the expectations of the curriculum. By creating an avenue for classroom music teachers to voice their lived experiences and perceptions, this investigation will ask teachers if they have
access to ICT resources, allowing the data to highlight the reality of resource provision throughout Queensland and reveal real-life experiences of classroom music teachers when trying to implement and deploy ICT in music education. From the data it is expected that school leadership and educational providers may be better informed of effective strategies so that school leadership and school support systems may positively guide the development of organisational practices to support music specialists in a way that would benefit the implementation of ICT within their schools.

1.5 Research questions

1.5.1 Development of research questions through personal experience

Through my own experience as a P-6 classroom music teacher, I have struggled with the acquisition of resources, having to buy my own resources, having to provide my own laptop and yet being told I am accountable for implementing ICT by the Principal who did not supply resources for the music room. As a classroom music teacher I have been frustrated and bewildered by the lack of support and understanding I have received from school leadership, teachers and ICT staff. I began to wonder if other classroom music teachers were experiencing the same frustrations and so I began my research journey with the research question: What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program? I wanted to know about the practical side of implementing ICT. As an experienced teacher I was familiar with the policy documents (ACARA, 2010) and I knew that I was supposed to implement ICT and I was keen to do so, but the lack of resources acted as a barrier that inhibited my ability to utilise ICT devices in my music classroom program. I wanted to know what barriers other classroom music specialists experienced when implementing ICT and I wanted to know what helped them implement ICT, so that through this mixed methods research the lived experiences of classroom music teachers could voice what was happening in music education and could collectively raise awareness to make an organisational change within schools. As a result of my personal experience and a review of literature the following primary research question has evolved: What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program?
To gain credible insight into the practical aspects which influence ICT implementation in music education, the lived experiences of professional classroom music teachers were revered to contain valuable information unique to the field. Sub-research questions targeting aspects pertaining to ICT implementation were designed to guide the investigation of target areas such as: defining ICT, availability of ICT resources, current teaching practices, teacher confidence and professional development. Table 1 outlines the list of sub-research questions used to guide this research investigation.

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<td>What are teachers’ perceptions of what ICT in music education means?</td>
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<td>Sub-research question 2</td>
<td>What resources do classroom music teachers currently have access to?</td>
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<tr>
<td>Sub-research question 3</td>
<td>How do classroom music teachers currently incorporate ICT into their music programs?</td>
</tr>
<tr>
<td>Sub-research question 4</td>
<td>How confident do classroom music teachers feel about using ICT in their music programs?</td>
</tr>
<tr>
<td>Sub-research question 5</td>
<td>What professional development do classroom music teachers believe will help them incorporate ICT into their music programs effectively</td>
</tr>
<tr>
<td>Sub-research question 6</td>
<td>What practices may enhance the implementation of ICT in music education?</td>
</tr>
</tbody>
</table>

**Table 1. List of sub-research questions.**

### 1.6 Thesis structure

This introductory chapter provides background knowledge of the Australian Curriculum, the role of education in supporting future economic growth through the development of skills and proficiencies of students, as well as the expected outcomes of ICT inclusion in music education.

Chapter Two presents a review of literature and looks at the reliance society places on ICT, the role of education to provide skills and proficiencies to all Australian students to enhance the
employability of citizens and support the future economy. The chapter discusses how Australia’s economic future has motivated an injection of government funds, how a review of the professional accountability of teachers has been enforced to facilitate and uphold professional standards, and the supporting role of school leadership as it is expected to provide local support prioritization for ICT implementation in music education. A brief examination of the intention of the Australian Curriculum is considered with regard to educational equality and the discourse created by failing to supply a definition of the term ICT for the F-10 music curriculum. A review of the literature highlights how the lack of consolidation between curriculum documents and research, casts doubt on the possibility of provisioning every student with ICT proficiencies. A definition of the term ICT is necessary to:

- outline the choice of ICT resources purchased for the music classroom,
- how ICT may be utilised within music programs,
- the role of resources used to support other music education methodologies,
- pedagogies best suited to accommodate ICT implementation appropriate for students belonging to a technological era and
- the issue of providing Professional Development to develop teacher confidence and support ICT integration. The term ‘teacher confidence’ refers to the level of self-confidence teachers have in their own ability to use ICT and the confidence they have in Implementing ICT with students in the music classroom.

Without a definition of ICT, these issues may become subject to interpretation and lead to inconsistency. An examination of the literature within the areas of:

- education (ACARA, 2012b; AITSL, 2011; Hammond, 2014; Hawkridge, 1990; Koh & Lee, 2008; McNair, 2000; MCEETYA, 2008; Reynolds et al., 2003),
- ICT (Aldunate & Nussbaum, 2013; Department of Education and Training [DET], 2014; Mehlenbacher, 2010; NESTA, 2012; Papanastasiou et al., 2003; Precision Industries, 2012; Queensland Studies Authority [QSA], 2013; Wikan & Molster, 2011),
- and music education (Bower, 2008; Crawford, 2009; Dobozy, 2013; Hedberg, 2011; Pascoe et al., 2005; Power & Klopper, 2011),
identifies a number of gaps within the research literature and educational policies. In particular, the literature review has highlighted issues of inequality and the potentially powerful influence exercised by school leadership within local contexts, which may determine the availability and accessibility of ICT resources, teacher confidence and professional development opportunities for classroom music teachers.

Chapter Three outlines and discusses the suitability of the overall philosophical framework of pragmatism and how pragmatism endeavours to uncover the underlying truth to effect change. The role of pragmatism is considered within the research design of mixed methods. A deliberation regarding the opposing quantitative and qualitative methodologies is followed by a review of how the combination of opposing paradigms of deductive and inductive approaches, were accommodated in this study. The combination of quantitative and qualitative research methods are framed within the conventions of explanatory sequential mixed methods research design, which is shown diagrammatically. Within the research framework of explanatory sequential mixed methods, an explanation of how the research investigation will be undertaken in two phases, utilising a Likert scale survey and semi-structured interviews to explore the lived experiences of classroom music teachers to gain insight into current issues associated with incorporating ICT in music education. The chapter presents details regarding the availability of the online survey and the number of responses received. The online survey which was distributed and collected from survey respondents throughout Queensland is discussed with reference to the research questions they informed. The chapter presents a justification regarding the validity of specialist classroom music teachers as participants and the procedures undertaken to conduct and collect survey data and semi-structured interviews. Questions have been designed to investigate the availability of ICT resources and support, teacher confidence, current teaching practices and professional development. Survey data collected using a Likert scale survey is analysed using Statistical Package for the Social Sciences (SPSS), Analysis of Variance (ANOVA) for identifying data correlations and Interpretative Phenomenological Analysis (IPA) for qualitative field texts are included. Considerations of validation, limitations and ethics are also included. This chapter outlines the framework that shapes this study and
contributes to the validity of the research, as the data collection aims to answer the primary research question and sub-research questions.

Chapter Four reports the data findings of the quantitative survey which informed the first phase of explanatory sequential mixed methods. This chapter presents a detailed data analysis of the findings, having been analysed using SPSS which are presented as percentage frequencies and ANOVA which have been used to analyse and identify significant correlations. Initial questions focused on teacher background information and school information. Survey responses provide percentage frequencies and correlations to advise the following areas of enquiry: how classroom music teachers define the term ICT, an itinerary of the resources available in Queensland music classrooms, ICT schemes operating in schools providing accessibility of ICT resources to students, available ICT resources provided by schools for the music classroom, ICT support, incorporating different types of ICT in music programs, do classroom music teachers feel confident using ICT in their music program and strategies teachers perceive to be beneficial, attendance frequencies of professional development and the practices that teachers perceive would enhance the implementation of ICT in the music education.

Chapter Five reports the findings of the qualitative semi-structured interviews which informed the first phase of explanatory sequential mixed methods. Interview field texts were obtained from a nested sample of those classroom music teachers who participated in the collection of survey data. Seven semi-structured interviews were conducted: two Prep to Year 6 (P-6) classroom music teachers from Education Queensland, one P-6 classroom music teacher from Catholic Education, one P-6 classroom music teacher from Independent Education, one Year 7 to Year 12 (7-12) classroom music teacher from Education Queensland, one 7-12 from Catholic Education and one 7-12 Independent Education. Answers collated from qualitative interview field texts, underwent analysis to identify shared themes and have been presented in accordance with the interview questions they help inform. Participant responses focused on the following areas of enquiry: resources available in classroom music, ICT support, school practices that help with the implementation of ICT in the music classroom, how classroom
music teachers define the term ICT, wish list and requests for ICT music resources, examples of incorporating ICT in the music program, teacher confidence regarding ICT, professional development classroom music teachers have found beneficial, the Australian Curriculum and ideas teachers would like to implement verses the reality.

Chapter Six offers a discussion of the findings from the corroboration of both the quantitative survey data and the qualitative interview field texts. This amalgamation of quantitative data and qualitative field texts represents a union of opposing paradigms of deductive and inductive approaches using the overall philosophical framework of pragmatism to find the underlying truth. Relationships between the shared themes found in the survey data and interview field texts will be discussed to construct a deeper level of understanding, by assembling a complete picture in answer to the research sub-research questions and research question which they have informed. The discussion will address the research question under the headings of resources, internet, computer labs and libraries, pedagogies incorporating ICT, ICT funding, defining ICT, ICT support, organisational practices and school leadership, Bring Your Own Device, Australian Curriculum, ideas verses reality, teacher confidence regarding ICT, Professional Development. An overview of the key findings of the research are diagrammatically represented, which provide visual representations of teachers’ perceptions regarding the issues identified in this research, influencing the implementing ICT in music programs. The implications and effects of these findings will be considered with the intention of fulfilling the objectives of the philosophical framework of pragmatism, that the truth will enlighten and effect change.

Chapter Seven discusses the key findings together with associated conclusions and recommendations. The chapter presents a review of the research questions that have guided this research investigation. A summary of the research design briefly recounts the literature review, research design and research findings. Limitations of this research will be presented, followed by considerations of: the contributions this research investigation has made to related research; and the effect of the hierarchy and organisational structures within education and the
role that School Leadership plays in determining the level of ICT immersion in music education and organisational practices supporting ICT implementation. Recommendations for further research will be suggested as directives for future change in education, since ICT immersion is relevant for all specialist subject areas within the curriculum and not just music education.

1.7 Synopsis of thesis

The Australian Curriculum: The Arts—music subject requires ICT to be intrinsically embedded in classroom music programs throughout Queensland. The practical application of this educational policy has been made the responsibility of all classroom music teachers. Through the perceptions and lived experiences of classroom music teachers, this research will be guided by the research question and sub-research questions, to investigate the teachers’ perceptions of organisational practices which positively and negatively influence the implementation of ICT in classroom music programs and teacher confidence regarding ICT implementation in music education.
Chapter 2: Literature Review

2.1 Introduction
This chapter reviews the corpus of research knowledge focusing on the role of ICT within the global economy, the role of ICT in education with particular reference to ICT in music education and the implementation of the Australian Curriculum and strategies employed to support ICT in music education. This literature review considers the myriad of ways in which ICT is utilised within business environments throughout the world, creates a glimpse into the way’s ICT continues to shape the way people do business within global and local markets and the degree of dependence that the global and local business economy has on ICT (Ardolino et al., 2018; ACARA, 2012b; Koh & Lee, 2008; Smedlund, 2012; Smith, 2013). It is through the roles of government and education in the facilitation of goals and outcomes, ICT skills and proficiencies are made available to the economic sector, which provides the population with employable skills relevant within the economic market. These considerations require the government to assume a beneficiary role to provide financial support and facilitate ICT initiatives, whilst education providers enforce the expectation of accountability to drive the implementation of ICT within the Australian Curriculum and subjects areas, in particular music education. An overview of the literature review is provided in Figure 1.

The role of ICT within the global economy

The role of ICT in education with particular reference to ICT in music education

Implementation of the Australian Curriculum and strategies employed to support ICT in music education

Figure 1. Outline of Literature Review.
It is the intention of this literature review to provide a deeper understanding of literature relevant to this research, to identify gaps within the body of literary knowledge and establish purpose for this research by addressing those areas void of evidential research. A review of educational policies compared to practical lived experiences of classroom music teachers found within current research, will separate ideological policies from reality. It is anticipated that identified issues will provide an insight and greater awareness into current concerns associated with incorporating ICT in music education.

2.2 The role of ICT within the global economy

ICT has revolutionised the way companies do business (Koh & Lee, 2008). People around the world have embraced Information and Communications Technology (ICT) in this digital age where instant access to information has become standardised and technological devices such as mobile phones, laptops and iPads are assessable to the general public and commonly used by children as well as adults. ICT has reformed traditional practices allowing social interfaces to be added to legal wills and Facebook social capital is considered a form of success. Global economies have experienced “rapid...advances in ICT [that have changed] the way people share, use, develop and process information and technology” (Ardolino et al., 2018; ACARA, 2012b, p. 6; Smedlund, 2012; Smith, 2013), which now rely heavily on ICT for many business transactions such as instant communication services, conference calls, mobile phones and mobile banking. Through the embracement of digital technologies, ICT has fundamentally demonstrated its innate ability to change how society functions both within local and global economic markets (Ardolino et al., 2018; ACARA, 2012b; Koh & Lee, 2008; Smedlund, 2012; Smith, 2013). The extensive potential of ICT to restructure global economic markets has also highlighted the need for global vigilance, since ICT also possesses the power to divide the wealth of countries, in particular those with ICT verses those without ICT (OECD, 2019). ICT is capable of driving economic growth and transforming economic practices, but those experiencing exclusion, in the form of those who lack access to ICT and lack knowledge and skills, become disconnected from ICT progression. According to McNair (2000) “those denied access to ICT skills and knowledge become less-and-less capable of participating in an economy
and a society that are increasingly technology-dependent” (p. 9). Being unable to engage in ICT through a lack of ICT resources is detrimental to the future progress of individuals, groups within society and even countries, causing a digital gap, whilst education and learning lie at the heart of a learning digital divide (OECD, 2019).

The well-being and progression of global economies is currently overseen by the Organisation for Economic Co-operation and Development (OECD) which is an intergovernmental economic organisation concerned with the economic advancement and world trade of thirty-six countries. The identification of key global issues that affect economies at national, regional and local levels are identified and developed to generate affluence and social inclusion within contributing countries. One major factor with the potential to influence a country’s affluence has been identified as ICT, which drives the development of knowledge and skills, stimulating better jobs and living standards. As economies increase their dependence on technological knowledge and skills, ICT skill development is imperative to economic prosperity (Organisation for Economic Co-operation and Development (OECD), 2002), because without ICT skills the workforce becomes outdated. This need for a skilled workforce further propels the global drive for reform through the development of ICT knowledge and skills through education.

It is important that governments look after both their national and international interests. For this reason, belonging to OECD protects countries, as leaders share conversations and information about current issues. As a country belonging to the OECD, Australia is privileged to share in up-to-date information regarding international trends shaping the future of the global economy. Through this membership, the overwhelming influence of ICT has been recognised by the OECD, which has motivated the Australian government to act, to avoid exclusion.

The significant and influential role of ICT within the global economy, has determined the reason why countries, including Australia, have chosen to actively participate in the national implementation of ICT for the benefit of the country, or risk elimination from digital prosperity of the nation in the future. In a global field of “intense competition and shifting competitive
advantages...education is central to preparing students for the demands of this new and complex environment” (Koh & Lee, 2008, p. 1). An example of this global competitiveness is evident within the global music industry and the competitiveness of Australia within this industry depends upon the development of up-to-date ICT skills. By recognising the importance of music education as the primary source of skills necessary to stay connected to the progressive use of ICT within the music industry, Australia is positioned to remain an active competitor within a global market.

Since ICT became accessible to the general public, ICT has facilitated the potential to accelerate economic development and has simultaneously emphasised the importance of the role of education, in providing education to develop student skills and knowledge, relevant to the future needs of the country. To effectively participate in a “competitive global economic setting, a highly skilled and educated workforce with aptitude and skills in the application of ICT is critical” (Nwaocha, 2014, p. 127). Within the changing future of technology “people, education and learning lie at the heart of these issues and their solutions [since] machines and sophisticated ICT equipment are useless without the competence to exploit them” (Koh & Lee, 2008, p. 1). Within these expectations of technological literacy and lifelong learning, the role of education aims to empower the resources of the future, as they adapt to a fast-evolving national and global environment they create and redefine with resilience, knowledge and skills. To guide the development of ICT knowledge and skills the role of the Australian Curriculum outlines educational pathways designed to progress and harness student potential.

2.2.1 ICT in the global economy

Within the global economy, a number of developed and developing countries have acknowledged the importance of implementing ICT policies, by focusing ICT implementation within the educational sector (Tondeur et al., 2007). The implementation of ICT has become a general trend within education (Purves, 2012b; Sweeney et al., 2017; Waddell & Williamon, 2019). In response to the recommendations of the OECD, thirty-six countries involving the United States, several European countries such as Portugal and Italy, United Kingdom, America,
Singapore, Cyprus and Australia among others, have invested considerable interest in the implementation of ICT in education through the reformation of educational curricula.

Research has identified a number of common economic and significant rationales which have been identified as foundational to the revision of educational curriculums within a number of countries. These rationales are general statements identified as the driving force behind policies relating to the incorporation of ICT in education:

- to support economic growth mainly by developing human capital and increasing the productivity of the workforce;
- to promote social development by sharing knowledge, fostering cultural creativity, increasing democratic participation, improving access to government services and enhancing social cohesion;
- to advance education reform through major curriculum revisions, shifts in pedagogy or assessment changes and;
- to support educational management and accountability, with an emphasis on computer-based testing and the use of digital data and management systems. (OECD, 2014, p. 14)

This statement highlights many of the key factors influencing the development and incorporation of ICT based strategies across a range of countries, as they strive to develop their capacity as an information society. In particular, those strategies pertinent to music education may include: shared knowledge, cultural creativity, social cohesion, shifts in pedagogy and assessment, to assist education in the support of economic development. Within the societal context of many nations, education is considered a tool for providing skills and proficiencies necessary for future economic prosperity (Tondeur et al., 2007, p. 962). In support of the rationale presented and to provide opportunities for all school-leavers to be digitally literate to create a knowledge-based economy, many countries have followed the trend by introducing ICT as a separate school subject to enhance technical ICT skills (OECD, 2014; Plomp et al., 2003).
Within the societal context, many children engage in ICT exploration at an early age within the home (Brigas et al., 2016). To protect low socio-economic students from digital exclusion, education has a responsibility to provide digital learning opportunities that integrate ICT in education. For this reason, investment to support the implementation of ICT within education has occurred in many countries such as Norway where ICT is “embedded in the national curriculum and linked to overall political priorities stated by the government: quality of learning, higher completion rates and students’ well-being and mastery” (OECD, 2014, p. 14). The Ministry of Education in Portugal has sponsored ICT programs and several European countries have begun steady ICT investment in educational curricula (Brigas et al., 2016). The United Kingdom has included ICT competencies in the formal national curriculum entitled *Qualification and Curricula and the use of ICT in education*. ICT competency Guidelines have been added into Flemish National Curriculum by the Ministry of the Flemish Community to inspire and direct the educational innovative process while adopting the use of ICT (Tondeur et al., 2007). To encourage and strengthen the “integration of ICT into curriculum, pedagogy and assessment to enhance learning and develop competencies for the 21st century” (Yeung et al., 2012, p. 860), educational policies in Singapore increasingly direct teachers to make greater use of ICT in their classroom practices through documents such as *Third Masterplan for ICT in Education* by the Singapore Ministry of Education (MOE Singapore, 2008). Many other countries have similar polices and initiatives aimed at justifying their financial investment in ICT implementation, by encouraging teachers to implement ICT. Examples of educational frameworks include: *ICT Strategic Framework for Education* in New Zealand (Ministry of Education (MOE) New Zealand, 2006) and *The National Education Technology Plan* in the USA (Department of Education USA, 2010). Based on the assumption that optimal pedagogy can impact student motivation and learning, by enforcing teachers to implement ICT through policies (Teo et al., 2008), research has found that “requiring people to comply with directives from the authority may not always lead to conformity” (Yeung et al., 2012, p. 862). To evaluate and justify the financial investment in ICT implementation, it has been suggested that benchmarks be designed to provide international comparisons to assess the degree of ICT implementation and progression toward achieving policy outcomes (Vrasidas, 2015).
2.2.2 International research on global trends in education

“There is a global trend that education authorities require teachers to apply educational technology in classroom practices” (Yeung et al., 2012, p. 860). This educational requirement has provided positive motivation for teachers to increase ICT implementation within the classroom, and has resulted in an overall international increase in the use of technology in education (Purves, 2012a; Vrasidas, 2015; Webster, 2012). Further research contradicted this international trend within European countries as it found that students use computers more at home than at school despite having ICT education policies (Vrasidas, 2015).

Many research studies have found that ICT has an increased impact on teaching and learning of subject content and the development of cognitive competencies when existing within a co-evolutionary environment, where ICT and schooling employ “educational strategies, pedagogical activities, and roles in which teachers and students are both actively involved, organizational practices and resources and educational policies” (Bottino, 2014). Research conducted in the United States found that “it is not computer use itself that has a positive or negative effect on the educational achievement of students, but the way in which computers are used” (Papanastasiou et al., 2003, p. 325). Research has identified that significant elements that influence ICT effectiveness are pedagogy, learning design and how technology is integrated into teaching and learning (Bower, 2008; Dobozy, 2013; Hedberg, 2011). Findings suggest that teachers focus on the development of technical ICT skills, this contradicts the intention of ICT curricula, which concentrates on the integration of ICT within subjects. Research conducted in several developed countries found that although the availability of ICT in schools has increased, there is a great deal of evidence that teachers do not use technology as expected (Aldunate & Nussbaum, 2013; Mehlenbacher, 2010; NESTA, 2012; Wikan & Molster, 2011). This represents a gap between curricula intent and application of ICT implementation (Tondeur et al., 2007). Research has found, to successfully guide the integration of ICT in education, professional development strategies encourage the development of effective pedagogies. Professional development educates teachers how to integrate technology in teaching and learning, whilst improving teacher competency (Vrasidas, 2015). According to a UK study conducted by Perrotta
(2013), an institutional demonstration of the benefits of ICT through professional development, influenced teachers’ perceptions and were mirrored by teachers in the classroom, with the most effective pedagogies being those based on student-centred practices (Ertmer et al., 2012). The intention of this research to investigate the effectiveness of ICT implementation and its alignment with the Australian Curriculum within Queensland Australia, to ascertain whether Australia reflects these global trends of increased resources, effective pedagogy and professional development, identified within international research.

Governments of developed countries have demanded the establishment of credible proof to ascertain the value of financial investments regarding the integration of ICT in education. This proof has been achieved through the establishment of benchmarks. The benchmarks focus on the relationship between ICT and the production of learning outcomes which have prompted research to investigate the effectiveness of ICT implementation, to understand whether teachers are using ICT in accordance with the competencies proposed and to examine challenges associated with the integration of technology in the classroom. Many impact studies search for causal relationships between ICT and attainment of educational objectives. One of the most significant international studies conducted has been the ImpaCT2 report (Harrison et al., 2002) which showed that ICT leads to statistically significant improvements in some subjects. Studies conducted by OECD have sought correlations between home access, the use of ICT and PISA scores. The E-learning Nordic study looked at the perceived impact of ICT through the perceptions of students, parents, teachers, principals showing that ICT can have a positive impact on education (Yeung et al., 2012). Yeung et al., (2012), also suggest a system of benchmarks which aligns with learning outcomes:

First order benchmarks are typically related to access to ICT. This could be pupil:computer ratio and broadband access; Second order benchmarks try to capture in what ways and to what extent ICT is used in teaching and learning. These benchmarks can cover a wide range of use patterns and learning technologies, and they should capture both teachers’ and students’ use of ICT.
Many countries have benchmarks for the first and second order but need to develop third order benchmarks. According to Pavel et al., (2014), to achieve optimum educational outcomes through the transformation of ICT development towards an information and knowledge-based society, is dependent on the application of three stages which are shown in Figure 2.

The three stages include: ICT Readiness – the level of networked infrastructure and access to ICTs; ICT Intensity – the level of use of ICTs in the society; ICT Impact – results/outcomes of effective and efficient ICT use” (Pavel et al., 2014, p. 706). The inadequate fulfilment of any stage will have a detrimental effect on the outcomes of ICT effectiveness. When considered in collaboration, the Yeong et al., (2012), system of benchmarks closely aligns with the three-stage model suggested by Pavel et al., (2014), to achieve educational outcomes. First order benchmarks align with ICT infrastructure and access which refers to the availability of ICT resources in schools in adequate quantities, and Second order benchmarks align with ICT Use and ICT Capability which refers to pedagogy and how ICT is incorporated in teaching and learning. To assess the successfulness of ICT integration it is necessary to ensure adequate
attention is given to these preliminary stages, as they directly influence the achievement of educational outcomes.

2.2.3 How international research influenced this research?

As a member of the international economic community, Australia has followed the general trend of implementing ICT in education and aims to achieve optimal ICT educational outcomes to remain economically inclusive within the global market. International research has informed this research of the importance of identifying factors which influence the achievement of ICT educational outcomes through the formation of barriers which inhibit the implementation of ICT, such as inadequate pedagogical instruction for teachers. Global research has found that whilst many countries have developed educational curriculums to implement ICT and placed greater responsibility for implementation on teachers, this has been found to insufficiently prepare teachers to fulfil this responsibility. Using the frameworks of Yeong et al., (2012) and Pavel et al., (2014), this research aims to investigate factors identified by the international research community as barriers to the implementation of ICT, including resource provision, effective pedagogies utilising ICT in the classroom, teacher competence and professional development. Through the investigation of these barriers, future reform to procedures associated with the incorporation of ICT in education may contribute to the attainment of desired educational outcomes that will benefit the Australian economy in the future.

2.2.4 Australia as a member of the International community

Within an ICT driven economy of the future, competitiveness depends on the ability of today’s students to “exploit information technology, manage and process information” (Koh & Lee, 2008), placing great responsibility on mainstream education to nurture and develop student creativity, thinking and skills. Educational providers have acknowledged that this rapid technological advancement has shaped the skills expectations of the workforce such that “skilled jobs now dominate job growth” (ACARA, 2012b, p. 6) by placing greater emphasis on the acquisition of ICT skills on today’s students. To ensure national economic growth in the future, the Education Department as a subsidiary of government, has revised the curriculum
placing greater emphasis on ICT. This curriculum review has resulted in the extensive inclusion of ICT in the 2012 Australian Curriculum, which aims to strategically prepare today’s students to be tech-savvy ICT-functioning citizens of tomorrow. The implementation of ICT within education is intended to re-affirm Australia’s position in a global economic society. The promotion of ICT as a catalyst of curriculum reform (Hammond, 2014; Hawkridge, 1990; Reynolds et al., 2003) has resulted in ICT being included in the Australian Curriculum as an independent subject as well as being embedded in every subject within the curriculum, which is expected to provide appropriate technological skills applicable within today’s society and that of the future. The objective of this educational initiative is to develop the ICT skills and proficiencies of students for future workplace relevance.

The Australian Curriculum is designed to provide every student with foundational and practical ICT skills to develop competence, creativity and confidence to acquire tertiary qualifications and global employment (ACARA, 2012). By equipping young Australians with contemporary employable skills necessary to be competitive and prosperous in a global information-rich workforce (Ministerial Council on Education Employment Training and Youth Affairs [MCEETYA], 2008), the curriculum aims to create a highly skilled workforce which exhibits resilience to future challenges and provides a foundation “to Australia’s skilled economy and provide crucial pathways to post-school success” (ACARA, 2012, p. 14). By preparing today’s students to be ICT-proficient citizens of tomorrow, the Australian Government and education authorities expect the curriculum to directly affect the economic growth and re-affirm the global context of Australian society in the future (Crawford, 2009). This educational initiative does not guarantee successful education of the Australian population without strategic management of ICT resources, and with “education and learning now the lifeblood of our 21st century knowledge societies, and ICT has become integral to them. The gaps that define the learning digital divide become as important as the more obvious gaps in access to the technology itself” (OECD, 2000, p. 1). Those people without ICT skills and knowledge, experience exclusion which involves “limited education and in contemporary society, a lack of access to current technologies” (McNair, 2000, p. 11). This exclusion may further intensify societal divisions currently
experienced by unemployed, poor, disabled, less educated, minority ethnic groups and women (McNair, 2000). To ensure that all Australian students have equitable access to ICT resources and skills necessary to develop digital literacy, the implementation of ICT has required considerable funding from the Australian government to support the reform, so that students may obtain physical access to ICT hardware and software to develop skills and knowledge pertinent to digital literacy, for the benefit of the country’s future.

2.3 The role of ICT in education with particular reference to ICT in music education

2.3.1 Funding for ICT

To guide the successful implementation of ICT in Australian schools a number of documents have been designed and published to provide policy guidelines to school leadership. One document designed to support the implementation of ICT within Queensland state schools is entitled Information and Knowledge Strategic Plan 2012-2016 (Department of Education Training and Employment [DETE], 2018). Another comprehensive policy document titled Smart Classrooms Bytes, 21 steps to 21st Century 1-to-1 success (Precision Industries, 2012) details twenty-one steps on how to introduce ICT into Queensland schools dealing with issues such as school boards, ICT purchases, teachers, parents and students. The document entitled The School ICT Supplementary Grant (DET, 2014) outlines financial support for the implementation of ICT. Whilst school ICT spending is determined by the school leadership within local contexts, the supplementary grant expenditure is restricted to include the provision of “professional learning and digital practice, ICT equipment and ICT support” (DET, 2014, p. 1). Further conditions of the grant states that purchased items must be integrated into curriculum delivery and are limited to ICT equipment and services, such as computers, hand held devices, software and networking infrastructure. To avoid confusion regarding the definition of ICT, the policy document states that items such as photocopiers, facsimile machines and furniture are not considered to be ICT equipment for the purposes of this grant. The grant may also provide ICT support including:

- managing all of the ICT resources at the school, administering network servers,
- configuring personal computers, systems and network installations, ensuring
availability and reliability of personal computers, systems and networks, recovering personal computers, systems and networks following faults and failures, providing support to school staff in the integration of ICT within the school. (DET, 2014, p. 1)

All spending of grant funding must comply with the expenditure criteria and is subject to review by the school audit. These spending recommendations indirectly demonstrate the Department of Education’s definition of the term ICT and may represent the unstated answer to a major gap in the P-10 music subject educational policy documents, which fails to define the term ICT. Despite the financial costs incurred by government in an effort to effectively support ICT reform and provide ICT infrastructure in schools, school leadership has been assigned the responsibility of being the primary resource providers within individual schools. This may represent a significant gap between policy and the reality that teachers face in schools, as it is the responsibility of school leadership to determine the allocation of finances within their local school context. Through the allocation of finances, school leadership dictates the availability and accessibility of ICT resources throughout the school and in particular, within the music classroom. School leadership has direct control over the acquisition of music education resources for Prep – Year 10 (P-10) music programs. This demonstrates the prioritisation school leadership places on music education within individual schools. The acquisition of ICT resources demonstrates the direct control school leadership possesses over the ability of classroom music teachers to be able to deliver the ICT requirements of The Arts-music curriculum.

2.3.2. Educational equity
The Australian Curriculum is a national curriculum intended for all Australian students. In a commitment to social equity, the policy of ‘No Child Left Behind’ is supported by the Australian Curriculum rationale, which “promotes excellence and equity in education” (ACARA, 2012a, p. 10). The policy acknowledges the entitlement of each Australian student to have “access to high-quality schooling regardless of gender, language, sexual orientation, pregnancy, culture,
ethnicity, religion, health or disability, socioeconomic background or geographic location” (MCEETYA, 2008, p. 7) and to eliminate inequity as a determinant of educational outcomes.

Despite the ‘No Child Left Behind’ policy, discrepancies existing between policies and real-life teaching practices have been previously recognised by the Department of Education, Science and Training (DEST): “While there are examples of excellent music education in schools, many Australian students miss out on effective music education because of the lack of equity of access; lack of quality of provision; and the poor status of music in many schools” (Crawford, 2009, p. 471; Pascoe et al., 2005; Power & Klopper, 2011). Research has found that inadequate policy practices exist within schools, where the unequal distribution of resources throughout Australia does not support policy ideology (Pascoe et al., 2005). This suggests that curriculum policy documents do not ensure equitable outcomes are achieved in all Australian schools, when school leadership decisions are made at local levels. Decisions intended to address local contexts represent a fragmentation of educational policies and increases the probability of inequity throughout geographical regions such as the State of Queensland. Inequitable decision-making practices within schools, and particularly in music education, result in the unequal distribution of resources throughout Australia, contrary to the intention of the educational policy ideology. This results in discrepancies between policies and real-life teaching practices.

In response to the launch of the Australian Curriculum, it is necessary to compare ideological policies with real-life experiences so that “all young Australians will be provided with the opportunity to reach their full potential” (MCEETYA, 2008, p. 18). This includes the equal distribution of resources throughout Australia for all subjects, in particular, the distribution of ICT resources for the purpose of classroom music education, which is the focus of this study. Equal provisioning of ICT resources throughout Queensland would demonstrate support for educational equity policies in providing a national standard to all music classrooms, in accordance with the Australian Curriculum equity objectives. Despite the distribution of resources occurring at local levels, guidelines for professional accountability are executed
nationwide and enforced, in an effort to ensure that consistent educational standards are delivered.

2.3.3 Accountability
To ensure the professional delivery of the curriculum, professional standards for teachers have published an organisational strategy documented to define professional guidelines detailing “what will be taught, what students need to learn and the expected quality of that learning” (ACARA, 2012b, p. 7).

AITSL specifies the Australian Professional Standards for Teachers which outlines the three domains of professional teacher qualities intrinsic to high quality and effective teaching. Through the integration of knowledge, practice and professionalism (AITSL, 2011) teacher effectiveness has been identified as “the single-most important in-school factor influencing student achievement” (AITSL, 2011, p. 1). As an ambassador for educational standards within a technological society, AITSL places teacher accountability as a direct contribution to future economic growth and as a result, teachers are held accountable for the effective delivery of the F-10 Australian Curriculum.
The Professional Standards for Teachers are:

<table>
<thead>
<tr>
<th>Professional Knowledge</th>
<th>1. Know students and how they learn</th>
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<tbody>
<tr>
<td></td>
<td>2. Know the content and how to teach it</td>
</tr>
<tr>
<td>Professional Practice</td>
<td>3. Plan for and implement effective teaching and learning</td>
</tr>
<tr>
<td></td>
<td>4. Create and maintain supportive and safe learning environments</td>
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<td></td>
<td>5. Assess, provide feedback and report on student learning</td>
</tr>
<tr>
<td>Professional Engagement</td>
<td>6. Engage in professional learning</td>
</tr>
<tr>
<td></td>
<td>7. Engage professionally with colleagues, parents/carers and the community</td>
</tr>
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</table>

Table 2. Teacher Professional Standards (AITSL, 2011, p. 3).

Table 2 outlines the Professional Standards areas comprised of seven standards. Teachers are expected to self-assess their own professional learning needs which are further aligned with professional career stages. Teacher registration requires professional standards be maintained as teachers are held professionally accountable for educational standards of all students.

To support the accountability of teachers, school leadership became accountable for student outcomes (MCEETYA, 2008) as well as providing teachers with “the allocation of time and resources” (ACARA, 2012, p. 10) appropriate support, skills and knowledge to “promote a culture of excellence...provide challenging and stimulating learning experiences [for] all students” (MCEETYA, 2008, p. 7). Despite the local decision-making practices of school leadership, this professional accountability is imposed nationally, on all teachers, including classroom music teachers, regardless of local contexts and the supply of adequate and appropriate ICT resources to support the implementation of ICT in music programs.
2.4 Implementation of the Australian Curriculum and strategies employed to support ICT in music education

2.4.1 The Arts

Influenced by the 2008 *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 2008) and the *Shape of the Australian Curriculum v4.0* (ACARA, 2012b) documents, the 2012 Australian Curriculum represents a significant review of educational curriculum to produce a national standard of education. The Australian Curriculum features the amalgamation of five subjects under the umbrella term The Arts. The five subjects are: Dance, Drama, Media Arts, Music and Visual Arts. According to ACARA (2013), “the curriculum entitles all Australian students to engage with these five arts subjects” (p. 1) throughout “primary school with opportunities for students to specialise in one or more Arts subjects from the beginning of secondary school” (ACARA, 2013, p. 1).

As a requirement of the curriculum, school leadership is responsible for the allocation of funds to support the implementation of ICT in The Arts. The financial priorities of school leadership determine the financial support given to all core subjects as well as music education, within the local context of each school. In contexts where school leadership does not provide adequate financial support or resources to music education, it is still expected that students achieve the ICT proficiency skills set out in educational outcomes, so that every student may become an effective adult within a global knowledge society. Within music education the development of employable ICT skills extends to those ICT skills used within the music field, so that every student may find employment within the contemporary music industry.

2.4.2 The Arts – music subject

Music plays an integral role in our society. The effects of music have been researched extensively in non-educational areas to determine the therapeutic (Bonde & Wigram, 2002; Bunt & Stige, 2014; Vink & Bruinsma, 2014), scientific (Cohen, 1984; Thaut, 2005) and neurological (Critchley & Henson, 2014; de l’Etoile, 2002; Rose, 2004) benefits of music. Research regarding the use of music for the engagement of students in differential teaching
and learning and language diversity (Drummond, 2005; Lawrence-Brown, 2004; Prashnig, 2004) has occurred in response to diversity and equity in multicultural education. Research literature from both the instrumental music sector and the education sector, outlines the many benefits, combined with the influence that studying music can have on both musical and academic outcomes, but academic outcomes (Brewer, 1995; Eisner & Bird, 1998; Ewing, 2010; Morrison, 1994; Singer, 2008; Southgate & Roscigno, 2009; Vaughn, 2000; Wolff, 2004; Yates, 2005) as well as non-academic outcomes (Forgeard, Winner, Norton, & Schlaug, 2008; Harrison, 2009; Morrison, 1994; Omar, Hailstone, Warren, Crutch, & Warren, 2010; Temmerman, 2008; Warner, 1999). Within the literature, music skills remain relevant within the requirements of the music subject, but music also positively influences higher academic achievements (Southgate & Roscigno, 2009), IQ advancement (Forgeard et al., 2008), development of high-level life-skills (Temmerman, 2008), cognitive development (Yoon, 2000), behaviour and discipline (Taylor, 1950), cultural identity (Barton & Harrison, 2006), classroom environment and concentration (Sigman, 2005), social and emotional development (Barrett, 2009) and whole school academic outcomes (Singer, 2008).

To ensure that all students are given opportunities to develop equitable skills on expected resources to demonstrate curriculum outcomes, the Australian Curriculum has embedded ICT within The Arts – music subject. Educational outcomes expect that the implementation of ICT resources will develop student ICT proficiencies (ACARA, 2012b) relevant for future employment within the music industry. To establish an understanding of what resources meet the definition of ICT, it is logical that classroom music teachers would refer to a definition of the term ICT within the Australian Curriculum documents.

2.5 ICT in education

2.5.1 Defining ICT

Since the implementation of the national curriculum, accountability for teaching the prescribed curriculum has been the subject of scrutiny. This environment requires teachers to depend on policy definitions for teaching direction and rely on them as necessary clarification tools, to
assist in conformation to curriculum requirements. The extensive inclusion of ICT within the Australian Curriculum has resulted in the development of numerous definitions of ICT being stated within curriculum documents, since ICT is defined as an independent subject as well as within the scope of other curriculum subjects. For the purpose of this research investigation, ACARA policy states that:

Students develop ICT capability as they learn to use ICT effectively and appropriately to access, create and communicate information and ideas, solve problems and work collaboratively in all learning areas at school, and in their lives beyond school. The capability involves students in learning to make the most of the digital technologies available to them, adapting to new ways of doing things as technologies evolve and limiting the risks to themselves and others in a digital environment. (ACARA, 2012, p. 16)

Using this statement, it is reasonable to suggest that students need access to ICT resources to acquire ICT skills. Despite the concise intention of this 2012 policy statement, research has previously identified resource insufficiencies within schools. The National Review of School Music Education (NRSME) (Pascoe et al., 2005) identified a lack of ICT resources for music education, a later study conducted by Crawford (2009) found insufficient resources to support classroom music teachers with “preferential distribution of resources towards subjects outside the Arts discipline” (p. 472), for instance National Assessment Program – Literacy and Numeracy (NAPLAN), MySchool and Science, Technology, Engineering and Mathematics (STEM). Some school authorities state that ICT resources are present within school computer labs, however research found that a lack of access to ICT “resources and time allocation in the computer laboratory” (Crawford, 2009, p. 472) rendered the ICT resources as inaccessible, and contributed to insufficient resources being provided by schools to the music classroom.

ACARA (2012b) documents outline that it is the responsibility of school authorities to provide effective educational resources such as “the allocation of time and other resources” (p. 10). ACARA acknowledges the element of flexibility when considering local contexts but states that
schools continue to remain responsible for the delivery of the curriculum (MCEETYA, 2008). In circumstances where school leadership provides under-resourced music classrooms, teachers are still held accountable for music programs they may not have resources to support. Effective teaching requires the availability of adequate and appropriate ICT resources within the music classroom. To determine what ICT resources are appropriate, the term ICT within the context of music education, requires definition.

The Supplementary Grant policy (DET, 2014) recognised that schools may not grasp which items come under the definition of ICT. To address this ambiguous nature of the term ICT, the policy stated that ICT spending included: “computers, hand held devices, computer driven peripherals, software” (DET, 2014, p. 1). This action reinforces the need for clarification through a definition of ICT for F-10 music, so that teachers are able to confidently determine what ICT means and be able to apply that definition to the practical resourcing of music classrooms. This policy also represents a gap in the literature since this information is only accessible by some levels of education, in particular school leadership, whilst classroom music teachers are denied access. This definition needs to be available to classroom music teachers within the F-10 Australian Curriculum and not isolated in Grant application documentation intended for school leadership, so that classroom music teachers may apply the definition of ICT within their music programs.

2.5.2 Definition of ICT within music education

To guide the implementation of ICT in music education, classroom music teachers rely on the Australian Curriculum to offer learning and teaching intentions which include definitions to support greater understanding of those intentions. An examination of the Australian Curriculum aimed to locate a definition of ICT within the F-10 music curriculum with a specific application to music education, which identifies ICT resources and how to utilise those resources in music education. Unfortunately no appropriate definitions were available within the F-10 curriculum documents. However, the Queensland Studies Authority (QSA) senior music syllabus which commenced implementation with Year 11 in 2014, offers the following definition of ICT within the context of music education:
Information and communication technologies (ICTs) in music encompass all technologies, including traditional and electronic musical instruments, digital devices, protocols and applications. ICT capability means having the technical and cognitive proficiency to access information, and being able to use, develop, create and communicate using the technological tools available. (Queensland Studies Authority [QSA], 2013, p. 7)

This defines two aspects of ICT within music education: types of resources and their use. The above definition indicates that ICT should involve technical and cognitive abilities to develop, create and communicate. In order to achieve these technical and cognitive proficiencies, students need access to appropriate ICT resources and a sufficient number of ICT resources to allow hands-on opportunities for every student within music classes. The above definition provides a useful reference to traditional and electronic resources, which provides a practical application for this research. Using this statement as a guideline, it is suggested that traditional and electronic instruments encompass those instruments previously purchased to contribute to the resource itinerary inspired by Kodaly and Orff methodologies of many current music classrooms. This may include traditional instruments such as: tuned and untuned percussion, ukuleles, electronic keyboards and CD players, as well as all other ICT equipment including: computer programs such as Garage Band, Photo Booth, Finale\(^2\) and Sibelius\(^3\). It is interesting to note that this definition provided by (QSA, 2013) focuses on two contentious issues that have been the focus of past research which is also the focus of this research investigation. They are: how ICT should be used and what is defined as ICT.

The above definition includes traditional instruments as ICT however, the inclusion of traditional instruments is not the consensus. Crawford (2009) states: ICT “does not encompass keyboards (electronic pianos) or more conventional instruments, though such instruments have contributed much to the foundations of contemporary music technology” (p. 473). Crawford

\(^2\) Finale - Music notation software for music composition.
\(^3\) Sibelius - Music Notation software used by composers, arrangers, publishers and educators. Create scores with unlimited parts and custom layouts.
(2009) further rejects the idea that an electronic keyboard be regarded as ICT due to the fact that it cannot be programmed, unlike a drum machine which has “layers of programmable sequences” (p. 473). Using this outline, untuned and tuned percussion instruments commonly found in the music classroom would also be excluded as ICT.

Research defines ICT broadly as “digital communication systems including: computers, associated peripheral devices and software, which are commonly linked together in networks” (Southcott & Crawford, 2011, p. 4). However, despite many definitions of ICT being available in current research, Crawford (2009) found that classroom music teachers are confused as to which resources are classified as ICT. For example, research conducted by Crawford (2009) found that field data responses demonstrated that some teachers believe tape recorders are classed as ICT, even though the survey material stated otherwise. This misconception, as to the definition of ICT, is significant because it affects the purchasing decisions of ICT resources for music classrooms. Consequently, without appropriate ICT resources, teachers are being held accountable for the fulfilment of a music curriculum that is under-resourced.

2.5.3 Using ICT in the music classroom

The definition (QSA, 2013) purported in section 2.5.2, identifies how ICT should be utilised within the music classroom. Policy documents are consistent in stating that in order to fulfil the requirements of the Australian Curriculum ICT must be used as both a tool to develop skills as well as a creative learning tool. The use of ICT as a digital tool is intended to develop: an understanding of the ethical and consequential use and storage of intellectual property, the ability to purposefully operate ICT, materialise creative intentions with digital solutions, share knowledge and digital solutions through the practical application of skills and knowledge regarding digital software and hardware function (ACARA, 2012b). For this reason, the practical development of ICT skills supports the constructivist pedagogies based on the early research of Piaget (1954, 1974), Papert (1980), Turkle (1984) and Dede (2009). These constructivist philosophies support the acquisition of deeper understanding through hands-on experiences.
(ACARA, 2012b) which requires adequate and appropriate resources. Research has identified different ways that ICT resources can be used within the music classroom.

Although the “use of ICT as a tool for teaching and learning...is now taken for granted across all areas of learning, including music, and at all levels of education” (Stevens, 2018, p. 59), research has contributed significantly to knowledge about how ICT may be used in the music classroom. This is also supported by (Baskin & Williams, 2006; Sarkar, 2012; Savage, 2010; Wastiau et al., 2013; Whelan, 2008). According to Southcott and Crawford (2011), ICT needs to be utilised in two ways: Computer Assisted Instruction (CAI) for repetitive skills development and Computer Assisted Learning (CAL) for creative learning, in order to fulfil the Australian Curriculum: The Arts - music requirements. ICT as a CAI teaching strategy is characterized by teacher guided instruction and intensive skill-development and is affiliated with high-structured teaching that assists with aural-training, sight singing and notational skills (Joseph, 2014; Southcott & Crawford, 2011, p. 3). Whilst CAI addresses the technical proficiency of curriculum, CAL addresses creativity. Research identifies the ability of CAL to enable students to engage in independent, “self-paced, interactive and personalized learning” (Power, 2019, p. 963) through the manipulation of sounds, experimental creative exploration and problem solving (Crawford, 2009). Representative of real-life popular music (Southcott & Crawford, 2011), flipped pedagogy (Bull & Kjellstrom, 2013) has been found to boost student interest and engagement through ICT devices, which provide instant feedback and gratification of composition and creativity without any inhibition of instrumental skill (Cain, 2004). Whilst CAI and CAL define the contribution of ICT to music education, the definition of ICT according to research differs from that contained in the policy documents.

Further research has identified a broad approach regarding the use of mobile devices and social learning networks, which favours the capacity of ICT to extend learning beyond the physical classroom and access external information sharing (Chan, 2010; Dede & Richards, 2012; Power, 2019; Wong, 2012). Opportunities for information sharing are facilitated through YouTube, Facebook, Instagram and other sites which enables cost-free access to performances and
enables sharing upload opportunities (Krauskopf et al., 2012). Zhang et al., (2011) identified a number of constructivist principles suitable for learning beyond the physical classroom which included: extend the use of ICT devices; integrate formal and informal learning activities; create learner-centred activities; utilise community support and resources; engage students in collaborative knowledge building; use ICT to cover curriculum content and conduct formative assessment (Power, 2019). This analogy of ICT usage supports constructivist CAL pedagogies designed to appeal to students’ need for instant feedback which provokes personal reaction to stimulus in authentic problem-solving exercises facilitated by ICT (Ertmer & Ottenbreit-Leftwich, 2013; Power, 2019).

2.5.4 Traditional resources for traditional music methodologies
Traditionally, primary education involving Prep to Year 6 (P-6) music programs in Queensland have been based on Kodaly and Orff methodologies. These traditional music educational programs have created an emphasis on singing and playing using traditional instrumentation, tuned and untuned percussion and keyboards (Ward, 2009; Williams, 2007), which has resulted in high achievement standards to the detriment of improvisation, composition, responding to music through analysis and evaluation (Williams, 2007). According to Mark and Madura (2010) “music teachers need to question the relevance of their instruction to increasingly technological youth” (p. 140) as traditional learning pedagogies characterize students as “passive recipients of knowledge, are inconsistent with the learning situations that occur in real life” (Crawford, 2009, p. 474). Williams (2007) suggests that music programs should:

- Reflect the societal shift caused by the digital technology revolution, since technology allows students to become the composer, the performer and the listener at the same time; technology’s increased multisensory aspect is visually stimulating, influencing student engagement; its affordability and accessibility means students can now do more musically at home without [teachers] than they can at school…in most traditional music programs. (p. 21)
The Australian Curriculum: The Arts - music subject does not stipulate any particular methodology. This raises the question: Will classroom music teachers embrace new methodologies or continue to rely on past methodologies and tools? By transforming music education with CAI and CAL, music may actively engage in real learning in constructivist learning environments that are meaningful and “truly applicable to the society” (Williams, 2007, p. 22) and bring the real world into the classroom (Hartwig, 2014).

2.5.5 ICT necessitates pedagogical change

There is a growing volume of research, especially from the United Kingdom and United States of America, regarding the implementation of ICT in schools. This research has identified that whilst teachers acknowledge the benefits of ICT in providing constructivist learning in a flexible and informal setting, which contributes to student “motivation and engagement” (Baker, 2013, p. 15), teachers are slow to change their teaching. Research conducted in Singapore found that the effective integration of ICT depended on teachers’ intentions to utilise ICT and their perception of usefulness, ease of use, subjective norm, facilitating conditions and attitude (Teo, 2011). To investigate if this reluctance to change exists within the context of Queensland, an understanding of the foundation of music education practices prevalent throughout Queensland may assist in developing greater appreciation of revered music education practices, the opposing philosophies incurred by the implementation of ICT as well as organisational practices and resourcing.

Music education in Queensland does not have a prescribed methodology but has been supported by a number of reputable methodologies, such as Kodaly and Orff. Kodaly is based on the “philosophy developed by Hungarian composer, Zoltán Kodály... the Kodály Music Education Institute of Australia (KMEIA) was founded by Dr Deanna Hoermann in 1973” (Kodaly Music Education Institute of Australia Incorporated [KMEIA], 2018, p. 1). According to KMEIA, the Kodaly concept is “committed to enhancing the musical skills of children and adults through sequential and developmental, singing-based programs” (KMEIA, 2018, p. 2). The “Australian National Council of Orff Schulwerk Association was founded in 1976” (Australian National
Council of Orff Schulwerk Association [ANCOSA], 2018, p. 1) and it supports the philosophy of Orff Schulwerk which is an approach to music education pioneered by German composer Carl Orff (1895-1982) and his colleague, Gunild Keetman. Its foundation was concerned with the child: the needs of the child and the emphasis on nourishing the musicality of each child through elemental activities in music and movement. The Orff teaching process involves singing; body percussion; playing on a variety of both tuned and untuned instruments; movement and dancing; and speech activities to encourage active music making. (ANCOSA, 2018)

Due to the extended history of Kodaly and Orff within music education in Queensland, some classroom music teachers have over time, accumulated suitable resources to deliver these methodologies and music concepts. In the same way, music classrooms require the provision of ICT resources to deliver the latest curriculum. Despite the simple ideal that teachers need ICT resources in order to teach ICT skills, the practical application of gaining access to ICT resources highlights a significant and current educational discrepancy. Research has found that an injection of substantial monetary investment, does not guarantee the implementation of ICT in schools (Hixon & Buckenmeyer, 2009). Reasons for this includes: the time needed for teachers to teach the curriculum and not just ICT elements; the emphasis on literacy and numeracy for national testing and improving the school’s reputation through NAPLAN and MySchool; the need for ongoing ICT support and; the need for professional development for teachers.

It is suggested that the integration of ICT within music education will require significant transformative pedagogical change, to enable students to experience immersive exposure to ICT in effective implementation of ICT in the music classroom (Haning, 2016; Herther, 2009; Hicks, 2011; Prensky, 2001; Wise et al., 2011), that meets goals for “subject matter content acquisition, critical thinking skills, motivation, and information literacy” (Yang & Wu, 2012, p. 340). Pedagogies that accommodate the learning styles of digital natives, contrary to those of teachers, need to facilitate student learning preferences such as “groups instead of working as
individuals, multi-tasking and hypertext learning environments instead of linear instruction, discovery-based learning methods instead of tell-and-test instruction, and instant gratification for short-term goals instead of delayed rewards for long-term objectives” (Haning, 2016, p. 79; Leong, 2011; Prensky, 2001). According to Merrick (1997), ninety-eight percent of teachers understand the educational value of ICT and seventy-seven percent of teachers understand that they need to adjust their teaching style in order to use ICT more effectively. Despite acknowledgement for pedagogical change towards an emphasis of peer and individual learning (Gay, Mills, & Airasian, 2014), research has found that the methods teachers use to educate students have “not changed at the same monumental pace as society” (Leong, 2011, p. 237) and instead, the “majority of music teachers use technology for...administrative [purposes] with less than thirty percent of teachers using computers during class time” (Bauer, Reese, & McAllister, 2003, p. 290). Of those teachers integrating ICT, the ImpaCT2 study showed that “relatively few teachers are integrating ICT in a way that motivates pupils and enriches learning or stimulates higher-level thinking and reasoning” (Onwuegbuzie & Collins, 2007, p. 156).

Despite claims that teachers have changed their practices (Cuban, 2001; Somekh, 2008; Wise et al., 2011), research has identified low level of usage and minimal pedagogical change (Aldunate & Nussbaum, 2013; Mehlenbacher, 2010; NESTA, 2012; Wikan & Molster, 2011; Wise et al., 2011) in the way teachers use ICT in their classrooms.

Within the literature there is a frequent perception denoting the ineffectual practice of ICT implementation, due to unchanged pedagogy that has resulted in underused and poorly integrated technology (Bauer & Daugherty, 2001; Davies, 2011; Dessoff, 2010; Donovan et al., 2011; Jimoyiannis & Komis, 2007; Lawless & Pellegrino, 2007; Lei, 2009; Prensky, 2001). Despite the plethora of research identifying the short-comings of ICT implementation within schools, it paints a fractional depiction of factors that influence the implementation of ICT, in particular, resources, support and professional development. Research conducted in the United Kingdom found “the lack of available computers and other equipment issues as significant perceived inhibitors to [the] use of ICT in the classroom” (Gall, 2013, p. 19). Within Australia, Crawford (2009) also identified “a lack of resources may be a realistic issue in many music classrooms” (p.
and acknowledges that assistance for music teachers requires “resources to be accessible and maintained, appropriate technological support provided and professional development encouraged” (Crawford, 2009, p. 474). Teachers need professional development that provides practical techniques that will teach them how to utilise ICT effectively in the music classroom practices. Teachers need guidance to be educated ICT consumers and be confident role models of ICT in the music classroom.

In order to persuade, encourage and support the transition from established teaching practices, research has recognised that teachers require appropriate resources, skills and knowledge through professional development to develop the confidence to incorporate new teaching practices (Hixon & Buckenmeyer, 2009). Through professional development, teachers may develop familiarity and fluency with ICT resources in order to have the confidence to use them in their music programs. In order to increase teacher confidence and change in teaching practices, opportunities to extend and develop teachers ICT skills make it necessary to address the issue of professional development.

2.5.6 Professional Development
Classroom music teachers are pivotal to the implementation of ICT in music education. In order for classroom music teachers to role model effective ICT usage in the music classroom, teachers need access to appropriate ICT resources and technological support, but they also need appropriate professional development, to increase skills and confidence in modelling ICT to students. Teachers risk falling behind the rate of change with digital media if they do not participate in professional development (Teo, 2011). According to Reese and Rimington (2000) only “twenty-five percent of teachers received formal technology training at a university” (p. 29). This lack of tertiary skill development is a contributing factor to the findings that “ninety-four percent of music teachers would prefer further technology training, but only thirteen percent of school districts offer music technology training annually” (Bauer et al., 2003, p. 290) and those “teachers in rural and regional areas can find it difficult to access professional learning activities” (Education and Training Committee, 2013, p. 87). Whilst it is agreed that
music teachers need and want professional development, it is essential to provide professional development opportunities that target appropriate learning outcomes.

Previous research into the issue of professional development for music educators has focused on strategies that increase music teachers’ confidence with ICT and “instructional strategies” (Bauer et al., 2003, p. 290). Whilst research has identified a need for professional development, research has found that to increase music teachers’ confidence with ICT, three intrinsic elements needed to be addressed: “teacher knowledge, teacher comfort [confidence] and frequency of teacher use” (Bauer et al., 2003, p. 289). The latter of these elements was found to contribute significantly to the effectiveness of professional development as stated by Bauer et al., (2003), “it is frequency of use of technology that leads to better quality of usefulness” (p. 298).

During the last fifteen years, professional development in education has focused on encouraging new teaching strategies using ICT and increasing music teachers’ confidence with the incorporation of ICT in classroom practices (Wise et al., 2011). Research has shown that professional development becomes ineffective when access to appropriate ICT resources is denied. This occurs when teachers do not have access to ICT resources to practise skills learnt during professional development, or when the school provides different ICT resources than the ones teachers were taught to use in professional development sessions (Hixon & Buckenmeyer, 2009; Norris, Sullivan, & Poirot, 2003). Professional development is considered irrelevant when “the school has few or no resources to support the incorporation of new technologies into the teaching and learning of music” (Crawford, 2009, p. 479). This raises the issue of accessibility of appropriate ICT resources for teachers and students to practise ICT skills. It is reasonable to suggest that without professional development being undertaken and practised there will be “little impact on the teaching and learning of music education” (Crawford, 2009, p. 473).

The relationship between accessibility and professional development has also been investigated by the research, which found that providing music teachers with ICT resources but without
professional development is ineffective. Schools identified as rich with ICT resources have failed to significantly impact teaching practices through the underutilization of their resources (Hixon & Buckenmeyer, 2009). To address the availability of professional development, ICT-savvy professional development websites have been made available by tutors such as Katie Wardrobe (2016) and James Humberstone (2017). Classroom music teachers can access these websites in their own time and choose to learn about specific ICT skills and how these skills may be applied to music education programs. Current professional development opportunities and websites such as these are available to classroom music teachers online and target the ICT needs of the individual at a convenient time. These findings are in keeping with the constructivist ethos and demonstrate the need for accessibility so that students and teachers can practise learner-centred interactive activities in the music classroom.

2.6 Summary
This chapter has reviewed literature that informs the research, by examining the literature in the areas of: the role of ICT within the global economy, the role of ICT in education with particular reference to ICT in music education and the Australian Curriculum in the implementation of governmental strategy specifically to ICT in music education. This literature review has examined literature in the areas of education, ICT and music education and has identified that a number of gaps exist within the research literature and educational policies. From this literature review it is evident that the Australian Government, educational policies and professional accountability are strategies intended to deliver equitable educational outcomes intended by Australian Curriculum throughout Australia. However a gap is exposed when the literature discusses the power of distribution held by school leadership within local contexts. This power held by school leadership, dictates the availability and accessibility of ICT resources and professional development opportunities for classroom music teachers which also effects teacher confidence when implementing ICT in music. Decisions made at local levels further undermine the level of equality intended by a national curriculum, when local level decisions are influenced by independent priorities of school leadership. The literature review also found that the intentions of providing every student with ICT proficiencies are undermined
by the lack of definition of the term ICT. Without a clear definition of ICT, teachers and school
leadership may interpret ICT to include resources contrary to the initial intention of the
Australian Government’s motivation and their educational objectives relevant to economic
growth. These literary findings support and justify the need for this research so that gaps
identified in the literary review may be further investigated.
3.1 Introduction

This chapter discusses the methodology adopted to investigate the perceptions and lived experiences of classroom music teachers specific to the organisational practices which positively and negatively influence the implementation of ICT in music education programs in Queensland. The research aims to collate survey data to construct a comprehensive itinerary of ICT resources currently within music classrooms throughout Queensland. This data will ascertain whether schools provide adequate quantities of resources for classroom music teachers to teach the curriculum. It is anticipated that this data may provide valuable insight into the current need for financial allocation for ICT resources and support the obvious assumption, that classroom music teachers cannot teach ICT without appropriate resources.

A quantitative approach will supply an objective numerical measurement and snapshot of the reality being investigated. This data will assist with increasing awareness in the supply of ICT resources but does not guarantee that ICT will be taught, due to the influence of other important factors that determine whether classroom music teachers would, or are able to use ICT in their music programs. To investigate these hidden influences, classroom music teachers will be revered as the primary source of valuable information that may inform this research. As a result, this research investigation will include opportunities to ask classroom music teachers about their teaching experiences, through the mediums of short answer questions as well as interview opportunities. Such qualitative methods provide the research with a depth of understanding unattainable by the initial quantitative data. In order to accommodate both the quantitative and qualitative needs of this research, this will provide itinerary data as well as deep understanding, the choice of methodology points strongly in the direction towards a mixed method approach.

This chapter presents an explanation and justification for the chosen research design, whilst simultaneously demonstrating its suitability by providing a foundation for a methodology that
best accommodates the needs of the research. The first section of this chapter commences with a discussion of the overall philosophical framework of pragmatism, which underpins the research methodology and supports the use of mixed methods. This section considers the philosophical work of Pierce (1839-1914) and James (1842-1910) and the search for the concept of truth within a changing reality (Hookway, 2016). The second section explains the characteristics of quantitative and qualitative methodologies and their opposing paradigms of deductive and inductive approaches considered when using mixed methods. An outline of the mixed methods will be discussed in relation to this research whilst connecting mixed methods with the philosophical framework of pragmatism. This aims to provide an understanding of the corresponding paradigm which has the capacity to harmoniously combine traditional paradigms that would otherwise remain oppositional. One particular mixed methodology used in this research was Explanatory Sequential Mixed Methods. The third section presents an explanation of the Explanatory Sequential Research Design used for this research. The methodology considers foundational theories of Greene, Caracelli and Graham (1989), Johnson and Onwuegbuzie (2004), Tashakkori & Teddlie (2003) and Cameron (2009) which support the collection of various data types to achieve greater understanding of the research problems. Further sections discuss the considerations of participants and how explanatory sequential mixed methods will be utilised in this research in the form of data collection, data analysis and data interpretation. Techniques undertaken to ensure validity, limitations of the research and ethical procedures are also presented.

3.2 Pragmatism
This section outlines the overarching philosophical framework that unifies the entire methodology of this investigation. The methodology of this study features a quantitative survey which addresses the issue of what resources classroom music teachers have, as well as a number of qualitative interviews which will address the issue of why classroom music teachers choose to implement ICT or cannot implement ICT in their music programs. For this reason, this study requires a philosophical framework capable of supporting mixed methods and harnessing the strengths of both quantitative and qualitative methodologies. The challenge is to find a
philosophical framework that has the potential to prioritise the research questions because the chosen framework must resist being submissive to one particular methodology but instead possess the capability to respect the philosophies of two polar research designs with opposing views of reality, to create an outcome that is accepted as one substantiated and verifiable form of reality. These reasons confidently guide this choice of philosophy towards pragmatism.

Pragmatism is noted as a philosophical framework that is deemed to exhibit a prime intention to delve deeper than the surface, to discover underlying truths and in doing so, to answer the research questions with honest and enlightening results.

Originating around 1870, pragmatism is “based on the work of Charles Sanders Peirce (1839–1914), William James (1842–1910) and John Dewey (1859–1952)” (Hookway, 2016, p. 1). Pragmatism is noted for its ability to address the philosophical dilemma between the opposing philosophies of quantitative and qualitative research. Quantitative research is revered as being the unequivocal objectivity of the scientific nature of quantitative research designs, that views reality as “relatively stable, determinate and therefore knowable and predictable” (Law, 2004, p. 144). In contrast, qualitative research characterises the empathetic nature of qualitative research designs, that views reality as a construction of multiple realities (Johnson & Onwuegbuzie, 2004) based on “natural inquiry, reliance on the researcher as the instrument of data collection, and a report style focussing more on narrative data then on numbers” (Holosko & Thyer, 2011, p. 97). Pragmatism connects the intent of these two contrasting methodologies to present a holistic representation of the truth, which “reconcile[s] the claims of science, on the one hand, with those of religion and morality on the other [to represent a philosophy in which] science, morality and religion are not in competition” (Hookway, 2016, p. 1).

The original philosophical ideas of pragmatism were published in 1878 in a paper entitled ‘How to Make our Ideas Clear’ written by Charles Sanders Peirce. Although James (1907) later termed the philosophy as pragmatism in 1898, it was after a revival of the philosophical movement occurred in 1970 that the central core of the pragmatic philosophy was realized. Due to this revitalisation, the term ‘pragmatist maxim’ became known as the characteristic rule of
pragmatism, which focuses the hypotheses towards tracing the ‘practical consequences’ of the topic being investigated and the deeper concept of truth. Favouring an “epistemological outlook to...inquiry” (Hookway, 2016, p. 1) pragmatist maxim focuses on “language, meaning, and truth... [and emphasizes the concept of] flexibility in belief change” (Godfrey-Smith, 2015, p. 10). This evolution of principles has resulted in pragmatism being regarded as: pluralism where experiences and observations comprise reality and within reality there is truth for every human being; change is a continual process and therefore reality and truth are always changing; individuals are granted the right to be equal with the freedom to exert environmental adjustment; pragmatism emphasizes the production of actions to encourage the attainment of knowledge to solve problems (Cohen, 1999; Sooraj, 2013). The key words explaining pragmatism are belief, reality, truth, time, change and action but in particular, it is this link “between belief and action [that goes] beyond the mainstream empiricist tradition” (Godfrey-Smith, 2015, p. 11) and sets pragmatism apart from other philosophies. When considering the research investigation being undertaken, pragmatism possesses the necessary characteristics that are relevant to this study, which aims to consider observations of classroom music teachers to obtain the truthful knowledge of the reality that is currently occurring in music classrooms.

The objective of pragmatism focuses on identifying the cause and effect. Once the root cause of a problem is identified a practical solution may be encouraged to effect change, which makes pragmatism particularly suited to the realms of social science and education. Peirce (1878) was an advocate for the ability of pragmatic researchers to assess the clarity of ideas and “consider what effects, that might conceivably have practical bearings” (p. 8). So whilst pragmatism places significant emphasis on the finding of knowledge and truth, it also places great emphasis on the practical manifestation of knowledge (Peirce, 1878). An interesting concept was put forward by Dewey (1920) who extended this basic idea of effect, by stating that “in order to discover the meaning of the idea [we must] ask for its consequences” (p. 132). This reflective statement needs the researcher to be mindful when considering the cause and effect, not just when looking at what exists now and what caused that to exist, but rather, as a researcher, I
must consider what cause and affect my research findings and suggestions will have, as these too may cause a new reality. With this phenomenon in mind and within the context of social science and education, the philosophical framework of pragmatism encourages the use of empirical data to guide researchers to explore the practical outcomes from that data to understand real-world phenomena (Johnson & Onwuegbuzie, 2004) and in doing so, elicit change.

Pragmatism is a unique philosophical framework that has many positive attributes suited to the needs of this research, in particular, its ability to provide a middle ground between quantitative and qualitative research. Using eclectic methods of data collection, the opportunity to discover the concepts of what and why behind the research questions being investigated, will provide a profound depth of understanding that is “both constructed and based on the reality of the world we experience and live in” (Johnson & Onwuegbuzie, 2004, p. 18). Pragmatism’s preoccupation with finding the truth within the current and changing reality, acknowledges the value of effective practices and the need for changing practices (Johnson & Onwuegbuzie, 2004). Unfortunately, some critics consider pragmatism’s promotion of gradual or incremental change to be sufficient cause to label pragmatism as vague, resulting in the rejection of the concept of truth (Johnson & Onwuegbuzie, 2004). As a researcher, I consider the ability of pragmatism to uncover the current truth within a current time and effect change is unquestionable. Criticism regarding the rate of change is unwarranted, since the rate of change is not within the scope of the philosophical framework, but rests on the shoulders of organisations initiating that change. It is the ability of pragmatism to cause organisations to change their practices, which is most appealing to this researcher and this criticism, merely provides further proof that the philosophical framework of pragmatism is highly suited to the requirements of the research being undertaken and the realm of education which it is targeting. Through the framework of pragmatism, this research aims to discover the truth and improve organisational practices involved in the implementation of ICT in music education, by being “oriented toward solving practical problems in the real world” (Feilzer, 2010, p. 8). For this reason, pragmatism is the ideal philosophical framework for this research. By asking
classroom music teachers to identify current practical issues within their educational setting and with the intention of creating a positive change, the researcher being guided by the philosophy of pragmatism, allows the researcher to reach a state of clarity.

3.3 Research Methodologies
Under the philosophical framework of pragmatism, both quantitative and qualitative methodologies are employed. In particular, these methodologies include the use of a quantitative survey and qualitative interviews. As traditional pillars of respected research practices, quantitative and qualitative methods are intrinsically connected to entrenched philosophies that are steeped in ordered structure and adhere to strict guidelines and protocols, which systematically preserve the purity of the genre and uphold their reputation and validity. Recent studies that have successfully utilised mixed methods in music education research (Fitzpatrick, 2014; Prichard, 2017; West, 2014) further reinforce this choice of methodology in this research. As a relatively new philosophy, pragmatism is forced to compete with these traditionally established methodologies and their associated philosophies, to be considered a valid research tool. In order to fully understand the philosophical dilemma that pragmatism must overcome, it is necessary to look at the characteristics of quantitative and qualitative methods and their associated philosophies.

3.3.1 Quantitative Methodologies
Quantitative methodologies are reputed for their application to researching phenomena in the fields of science and social science. Used to prove or disprove a hypothesis, the research investigation collects numerical data from a large participant group. This data is then assigned and analysed using statistical analysis to identify numerical relationships, “describe trends and explain the relationship among variables” (Creswell, 2014a, p. 10). The researcher then interprets the data according to the original hypotheses, prior predictions and research studies. The findings of the quantitative research are “presented in a standard format [whilst maintaining] researcher objectivity and [a] lack of bias” (Creswell, 2014a, p. 10).
Quantitative research is characterised by a deductive approach, which is concerned with the testing of hypotheses to determine cause-effect relationships between variables (Gay et al., 2014). The philosophical framework underlying quantitative research is known as the positivist research paradigm. Positivist philosophers who are noted for their contribution to the development of positivism include quantitative purists [such as]: “Ayer (1959); Maxwell & Delaney (2004); Popper (1959); Schrag (1992), [who] articulate assumptions that are consistent with what is commonly called a positivist philosophy” (Johnson & Onwuegbuzie, 2004, p. 14). This philosophy supports the collection and measurement of factual knowledge using statistical analysis. Positivist philosophy requires the observing researcher to be separate from the subject being observed, creating an objective reality (Cohen & Crabtree, 2006). In this way, researchers maintain an objective reality to analyse and interpret quantitative data (Gay et al., 2014) with the intention of eliminating the researcher’s bias and influence on the research findings. According to Tashakkori and Teddlie (1998) quantitative researchers focus on establishing and describing social laws using rhetorical neutrality and technical terminology in a formal writing style.

It is important to understand that quantitative research methodologies are steeped in established traditional procedures and the research paradigm of positivism must be followed, to preserve the credibility of the research. Quantitative research may be perceived as a silo (Tett, 2015) which is reluctant to acknowledge the validity of other methodologies. This poses a significant problem for this research investigation being undertaken, since the desired methodology requires a quantitative survey to co-exist with another methodology genre, that is, qualitative research.

3.3.2 Qualitative Methodologies

Qualitative research is a method of inquiry (Creswell, 2014a, p. 10) which is also used in the field of social science. According to Holosko and Thyer (2011) qualitative research is defined as:

The systematic, first hand observation of real-world phenomena. It has minimally three qualities: focus on natural inquiry, reliance on the researcher
as the instrument of data collection, and a report style focusing more on narrative data than on numbers; examples include, ethnography, phenomenology [and] case studies. (p. 97)

To investigate a phenomenon, Creswell (2014a) states that the qualitative researcher:

- Collects detailed views of participants in the form of words or images, and analyzes the information for description and themes. From the data, the researcher interprets the meaning of the information, drawing on personal reflections and past research. The structure of the final report is flexible and it displays the researcher’s biases and thoughts. (p. 10)

Qualitative research employs techniques including semi-structured interviews and focus groups. The intention of qualitative research is to develop a greater understanding of underlying reasons, attitudes, opinions, behaviours, motivations, lived experiences and insights into problems. A small participant group provides the field texts that are used for the identification of trends and patterns.

Qualitative research is characterised by an inductive approach, which focuses “on describing and understanding relationships” (Gay et al., 2014, p. 425). The research paradigm of subjectivism is one philosophical framework that may be found within qualitative research, which focuses the research on:

- Phenomena as they appear and recognizes that reality is subjective and a matter of appearances for us in our social world. Subjectivity means that the world becomes real through our contact with it and acquires meaning through our interpretations of that contact. Truth, then, is a composite of realities, and access to truth is a problem of access to human subjectivity. (Boyd, 1993, p. 66)

Qualitative purists support the concept that “multiple-constructed realities” (Johnson & Onwuegbuzie, 2004, p. 14) exist within time, context and values (Johnson & Onwuegbuzie,
Within the subjectivist philosophy, the researcher is permitted to allow the investigation to unfold as the research progresses (Gay et al., 2014). Analysis of field texts then requires the qualitative researcher to “focus on interpreting their participants’ perspectives” (Gay et al., 2014, p. 425). This interpretation of field texts is the result of the perceived understanding of the participants meaning, since “explanations are generated inductively from the data and that knower and known cannot be separated because the subjective knower is the only source of reality” (Guba, 1990; Johnson & Onwuegbuzie, 2004, p. 14). Qualitative purists adopt a detailed, empathic and informal style of writing (Johnson & Onwuegbuzie, 2004).

For the purpose of this investigation, it is necessary for the chosen methodology to possess the ability to address the research questions. In order to achieve this, the study requires both quantitative and qualitative methodologies to be featured within the one study. For this reason, the most appropriate methodology is mixed methods, so that quantitative methods may collect preliminary data and qualitative methods may provide further investigative opportunities to investigate the findings in greater depth.

Mixed methods have been the subject of dispute due to the contrary philosophical background of each methodology. Contention regarding the combination of quantitative and qualitative methodologies and “accommodation between paradigms is impossible” (Guba, 1990, p. 81). Current arguments have created a culture of one methodology trying to be more superior than the other, with one having “deep, rich observational data and the other the virtues of hard, generalizable . . . data” (Sieber, 1973, p. 1335). It is not the intention of this project to favour one methodology over another, but simply to draw from the strengths of both quantitative and qualitative methodologies (Johnson & Onwuegbuzie, 2004) to benefit the research, to answer the research questions effectively and in doing so, provide relevant information that can change current workplace practices.
3.3.3 Mixed Methods

From this foundational knowledge of quantitative and qualitative research methodologies explained in sections 3.3.1 and 3.3.2, it has become apparent that a variety of methods will be needed, to achieve the desired effect of delving deeply into the truth behind the issues. For this reason, the methodology best suited to this research investigation is mixed methods. The following, is a brief explanation of the methodology known as mixed methods and the overall philosophical framework of pragmatism. This section will look at the relationship between pragmatism and mixed methods, so that the appropriateness of mixed methods may be evaluated in light of the chosen framework and the research being conducted.

Mixed methods stand between the constitutional traditions of quantitative and qualitative research. Courageous in its daring to question beyond these two traditional pillars of research, Johnson and Onwuegbuzie (2004) refer to mixed methods as the third research paradigm and define it as “research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study” (p. 17) and “within the same framework” (Johnson & Onwuegbuzie, 2004, p. 24). Often the subject of debate, mixed methods research has developed due to the work of scholars such as: Brewer & Hunter (1989), Creswell (2003), Greene et al., (1989), Johnson & Christensen (2004), Johnson & Onwuegbuzie (2004), Newman & Benz (1998), Reichardt & Rallis (1994), Tashakkori & Teddlie (1998, 2003). These scholars have explored the interdisciplinary capabilities of mixed methods which supports the research paradigm of pragmatism, to “provide warranted assertions about human beings...and the environments in which they live” (Biesta & Burbules, 2003; Johnson & Onwuegbuzie, 2004, p. 15).

Scholars have drawn a strong link between the philosophical framework of pragmatism and mixed methods, prompting support from writers such as Johnson & Onwuegbuzie (2004) who refer to pragmatism as the research paradigm and “philosophical partner for mixed methods” (p. 17). One consequence of this partnership, is that pragmatism provides the philosophical framework that allows research approaches to be successfully eclectic (Hoshmand, 2003) and
to “focus on ‘what works’ as the truth, regarding the research questions under investigation” (Tashakkori & Teddlie, 2003, p. 713). Pragmatism possesses a logical flexibility that “includes the use of induction (or discovery of patterns), deduction (testing of theories and hypotheses) and abduction (using explanations for understanding one’s results)” (Johnson & Onwuegbuzie, 2004, p. 17). This flexibility allows the utilisation of any relevant tools to fulfil the purpose of the research, to discover the issues being investigated and infer practical solutions to benefit the wider participant population at the centre of the research. This element of flexibility creates a complimentary partnership between the philosophical framework of pragmatism and mixed methods.

Mixed methods defies those who insist on the exclusivity of quantitative or qualitative techniques (Johnson & Onwuegbuzie, 2004). Instead, researchers are encouraged to use a foundational knowledge of the characteristics of quantitative and qualitative research, to choose methods with creativity and without limitation, taking an “eclectic approach to method selection” (p. 17). Even though, researchers using mixed methods may be challenged by knowing how to use multiple methods in a way that gains the respect of purist researchers, it is important to note that mixed methods research is “more likely to select methods and approaches with respect to their underlying research questions, rather than with regard to some preconceived biases about which research paradigm should have hegemony in social science research” (p. 23). Since in mixed methods, it is not the paradigm that dominates the prescribed course of action, but instead, the emphasis is on the suitability of the methods to address the research questions and the purpose of the research. It embraces the use of any available techniques for the benefit of achieving purposeful research and prioritizes the need for research methods to address the research questions being investigated.

The research design of this investigation has been calculated to yield data through the combination of different quantitative and qualitative data techniques. The “epistemological and methodological pluralism” (Johnson & Onwuegbuzie, 2004, p. 15) of mixed methods within educational research, can effectively draw on multiple methods to investigate research
questions and facilitate the collaboration of findings to provide quality research. By utilising the flexible and accommodating nature of mixed methods, it is intended to construct a holistic picture and develop a deeper level of understanding of the research problem (Morgan, 2007; Patton, 1990; Rossman & Wilson, 1985; Tashakkori & Teddlie, 2010).

Within the pragmatic framework, mixed methods can accommodate the investigation of itinerary data along with an acknowledgment of the human aspect of the investigation, through the consideration of the range of influences from personal experiences or cultural attitudes to objective phenomena. This will render the findings as both useful to practical application and beneficial to the participant population involved in the research. Furthermore, the mixed combination of itinerary data and human field texts will provide a framework of triangulation and assist in the validation of the research findings.

The issue of validation is a major consideration when using mixed methods. Being the third paradigm, it may be necessary to provide reassurance regarding the validity of interpretations and conclusions of the research. A perception of greater validity will ultimately contribute to achieving greater compliance of adjusting organisational practices (Onwuegbuzie & Leech, 2004). According to Greene et al., (1989) there are five purposes of mixed methods: “triangulation, complementary, development, initiation and expansion” (p. 255), which can increase validity through the comparison of quantitative and qualitative data findings. As it is the intention of this research to persuade organisational practices where needed, these validity techniques were carefully considered.

For the purpose of compiling valid data, the mixed methods research design features a two phase investigation consisting of a quantitative phase involving the collection of statistical data, which then provides the basis for collecting qualitative field texts in the second phase. This diversity of data endeavours to “build on synergy and strength that exists between quantitative and qualitative research methods to understand a phenomenon more fully than is possible using either quantitative or qualitative methods alone” (Gay et al., 2014, p. 423). It is
understood that by using the technique of expansion the methods utilised in the investigation will provide opportunities for different forms of inquiry, such as quantitative and qualitative methods. By conducting these methods in a consecutive manner, it creates an opportunity for the initial data to inform interview questioning, so that contradictions may be identified and may lead to the initiation of re-framing of the research questions. This allows the development of the survey findings to inform the interview questions and demonstrates the complementarity nature of the research design. Elements of clarification and enhancement become possible as diverse research methods collect data that corroborates and elaborates on identified themes, thus creating triangulation. This diversity of data “convergence and corroboration of results” (Johnson & Onwuegbuzie, 2004, p. 22) creates triangulation necessary to strengthen the validity of the findings. Achieving these purposes allows the researcher to draw valid and useful conclusions from the data, which increases the validity of the research findings. Furthermore, a high level of validity may influence the acceptance of the research findings which may lead to the introduction of recommended changes to workplace regimes.

3.3.4 Explanatory Sequential Mixed Methods

Beneath the umbrella framework of mixed methods, the research design chosen for this investigation is Explanatory Sequential Mixed Methods. According to Creswell (2014b) this method of inquiry is based on “the core assumption... that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone” (p. 4). Explanatory sequential mixed methods are comprised of a deliberate sequential design involving two phases. Phase I features a broad survey aimed at collecting quantitative data concerning an aspect of a population under investigation. An analysis of Phase I data then leads to Phase II which focuses on qualitative, open-ended interviews that are designed to collect detailed views from participants to facilitate in-depth qualitative exploration that will refine, elaborate and explain the initial quantitative survey within Phase 1. Explanatory sequential mixed methods must retain the independence of both quantitative and qualitative entities, until the research design determines the amalgamation of the parts. According to Creswell (2014a) “the difficulty...is that the researcher needs to
determine what aspects of quantitative results to follow up on...participants to sample...as well as the questions to ask” (p. 573). The two phases of explanatory sequential mixed methods design make it “labor intensive and time consuming” (Creswell, 2014a, p. 573) although it “yields considerable data to address the research questions relevant to social and behavioural sciences” (Ivankova, Creswell, & Stick, 2006, p. 4).

The sequential element of explanatory sequential mixed methods design requires that the collection and analysis of the quantitative data takes place before the collection of qualitative field text commences (Ivankova et al., 2006). This sequential process supports the explanatory quality of the design, “because the initial quantitative data results are explained further with the qualitative data” (Creswell, 2014b, p. 15). The “two consecutive phases within one study” (Ivankova et al., 2006, p. 3) of explanatory sequential mixed methods “complement each other and allow for a more robust analysis, taking advantage of the strengths of each” (Ivankova et al., 2006, pp. 3-4). This contributes to the triangulation qualities of explanatory sequential mixed methods design and increases the degree of assurance of validity (Jick, 1979). This theoretical framework of explanatory sequential research design has been used as a guide for this project.

According to the framework, data collection will occur in two phases, with Phase I will consist of a quantitative survey and Phase II will feature a number of semi-structured qualitative interviews. The quantitative survey used in Phase I aims to collect extensive numerical inventory data about ICT resources specifically for the music subject. This itinerary of ICT resources is an important part of the data collection and is necessary to determine if classroom music teachers have the appropriate resources in adequate quantities to teach the Australian Curriculum for which they are professionally accountable. Attitudinal data and short responses from classroom music teachers throughout Queensland will also be collected to provide insight into teachers’ perceptions of positive and negative practices which influence ICT implementation in music education. Information from the quantitative survey will be used “to
infer information about a population based on the representative sample drawn from that population” (Gay et al., 2014, p. 192).

Following an analysis of the quantitative survey data, thematic trends identified from frequency analysis will be further investigated through qualitative semi-structured interviews with a number of classroom music teachers. The intention of conducting qualitative interviews is to develop a deeper understanding of teachers’ perceptions and lived experiences, to determine what teachers perceive as important with regard to implementing ICT resources, ICT support and professional development necessary to increase teacher confidence. By engaging in one-to-one interviews with participants, the aim is to collect field texts of teachers’ lived experiences, thoughts, emotions, successes and failures with the intention of uncovering a personal level of experiences and deeper level of understanding. By engaging participants in semi-structured interviews a relationship of trust may be established and conversation may reveal new information that will positively affect workplace practices to better support classroom music teachers. Analysis of these qualitative field texts from Phase II will involve interpretivist qualitative research (Wise et al., 2011, p. 185), which will combine the philosophy of Husserl’s phenomenology and Dilthey’s philosophy of hermeneutics, so that information-rich field texts, resources and perceptions may provide insightful classroom music teachers’ views “of the situation being studied [to] generate or inductively develop a pattern of meanings” (Mackenzie & Knipe, 2006, p. 3).

3.4 Research Design

Within the realm of mixed methods and the philosophical framework of pragmatism, the conceptual framework known as explanatory sequential mixed method design is aligned clearly with the aim of this study. The following diagram is based on a diagram by Laberge Gaudin, Receveur, Walz, Girard and Potvin (2014) and adjusted to show the stages used for the purpose of this research design:
Explanatory sequential mixed methods design
(Adapted from Laberge Gaudin, Receveur, Walz, Girard & Potvin, 2014)

Table 3 outlines the mixed methodology of the research design organised according to the conceptual framework of explanatory sequential mixed method.

This conceptual framework consists of two phases, in which Phase I is aligned with quantitative survey research and Phase II is aligned with qualitative research. The conceptual framework of Phase I within explanatory sequential mixed method design involves the distribution of a Likert survey to collect quantitative data from classroom music teachers. In particular, this broad quantitative Likert scale survey aims to collect inventory data about ICT resources for music
education, by collecting numerical data for statistical analysis as well as attitudinal data in the form of short answers for thematic analysis from classroom music teachers. The Likert survey instrument is designed to collect: ratio variables with a true zero value including numerical data to demonstrate an inventory of ICT resources; nominal variables to categorize participant information, for example, gender and years of teaching experience, school area and school type; and attitudinal data measuring both positive, negative and neutral positions (Creswell, 2014a; Kumar, 2014) using a categorical scale of: strongly disagree (1), disagree (2), uncertain (3), agree (4), strongly agree (5) (Creswell, 2014a; Kumar, 2014). The use of categories for attitudinal responses provides the opportunity to “elicit an overall attitude towards the issues being measured” (Kumar, 2014, p. 203). For this reason the Likert survey “measured the intensity of respondents’ attitudes towards the various...issues [being investigated and it provided] techniques to combine the attitudes towards different aspects into one overall indicator” (Kumar, 2014, p. 203).

Survey data collected during Phase I is destined to undergo quantitative data analysis to identify statistical frequencies and thematic trends through numerical representation of reality at that time, but it will not provide underlying reasons as to why that reality exists. It is also evident that in order to answer the research questions effectively, Phase II needs to delve into the lived experiences and perceptions of classroom music teachers, to uncover true meaning and a greater understanding of the reasons behind the quantitative survey responses. To achieve this deeper level of understanding, interview questions will be designed using the thematic trends identified through the statistical frequency of Phase I survey data. For this reason Phase I thematic trends provide the basis of questions for Phase II of the explanatory sequential mixed methods design. This is in keeping with explanatory sequential mixed methods where Phase I is designed to provide the interview questions for Phase II of the methodology. It is noted that one significant limitation of this design involves the increased responsibility on the identification of thematic trends from the survey data.
The conceptual framework of Phase II within explanatory sequential mixed method design features qualitative research. Questions constructed from the thematic trends identified within Phase I, will be utilized in Phase II to gain a greater understanding of the lived experiences and perceived meanings from participants. As shown in Table 3, Phase II features semi-structured interviews using a nested sampling design, where key informants “represent a subset” (Onwuegbuzie & Collins, 2007, p. 292) from within the survey sample. Whilst Onwuegbuzie & Collins (2007) suggest that three to five participants are required for the nested sampling design, this research will involve seven one-to-one semi-structured interviews conducted with classroom music teachers. All participants are considered key informants, to help attain “data saturation [and] theoretical saturation” (Onwuegbuzie & Leech, 2007, p. 247). A nested sample of seven schools, including both primary and secondary music teachers, is intended to represent a balance of educational providers for possible comparative analysis.

Qualitative field texts collected during Phase II semi-structured interviews will undergo IPA analysis (Joseph, 2014). IPA combined the philosophy of Husserl’s phenomenology which aimed to uncover meaning and Dilthey’s philosophy of hermeneutics which aimed to understand and interpret meaning. Semi-structured interviews will be audiotaped and transcribed to assist with accuracy of qualitative field text recollection.

### 3.5 Participants

Music education in Queensland is delivered as a specialist subject by specialist classroom music teachers in Secondary schools (Years 7-12) and many Primary schools (P-6). For this reason, classroom music teachers possess valuable information unique to their field of expertise and are regarded as appropriate participants for data collection since they are privy to specialist subject information. Ideally this would involve all classroom music teachers throughout Australia, in response to the national 2012 Australian Curriculum. However, a number of considerations determined the impracticality of conducting an Australian-wide survey such as: a number of States and Territories throughout Australia chose to implement the National Curriculum differently and at different times; a number of States and Territories do not employ
specialist music teachers to teach the classroom music subject; a national survey was considered unrealistic within the time constraints in which to distribute and collect the Likert survey covering such a large geographical area; gaining ethics permission from numerous educational providers in every state of Australia would exceed time limitations placed on this research study. For these reasons it was decided that by limiting the geographical region of the study to the State of Queensland, the data collection will be a more achievable goal. Also, by focusing the data collection within the State of Queensland the familiarity of the researcher will be an advantage and considered insightful when designing survey questions for Phase I and interview questions for Phase II of the explanatory sequential mixed methodology.

Participants chosen to participate in the collection of quantitative data, featured in Phase I of the explanatory sequential mixed methodology, will be chosen for their professional expertise and geographical location within the State of Queensland, Australia. The participants will include a “purposeful sample” (Creswell, 2014a, p. 228) of P-10 classroom music teachers currently teaching in schools throughout Queensland. All classroom music teachers in Queensland will be given an equal opportunity to participate (Onwuegbuzie & Collins, 2007) in Phase I of the survey of the research investigation. After receiving permission from all relevant educational providers and principals, classroom music teachers employed by the Department of Education Queensland, Catholic Education and Independent Education schools are invited to participate in the Phase I survey.

The involvement of classroom music teachers from the three educational providers Independent Education, Catholic Education and Education Queensland, create a diverse source of data and provide an opportunity for sub-group comparisons. Comparative data supports the need for alias identities (Onwuegbuzie & Collins, 2007). Coded identities will be known only by the researcher and reported as coded data. Themes identified from the analysis of Phase I quantitative data are used to form the basis of Phase II investigations.
Phase II will focus on the collection of qualitative field texts through the medium of semi-structured one-to-one interviews. A sample population of seven classroom music teachers consisting of two or three participants from each educational provider will be invited to participate in semi-structured interviews. The purpose of collecting qualitative field texts is to investigate the perceptions and lived experiences of classroom music teachers. The research recognises that classroom music teachers are owners and creators of their own private knowledge. Each classroom music teacher creates their own reality based on their lived experiences, within the contexts of their individual school environments. As catalysts between curriculum and classroom, it is important for this research investigation to discover what resources classroom music teachers need to implement ICT and understand what organisational practices occur within school environments that may positively and negatively influence teachers and in particular, what organisational practices help classroom music teachers use ICT or what does not help classroom music teachers use ICT in their music classroom. By choosing specialist classroom music teachers as participants for this research it is intended that this will provide a deeper understanding of the themes identified through the quantitative data. Specifically, the research aims to understand the factors that positively and negatively influence the implementation of ICT in music programs.

3.6 Data collection
The targeted area for survey data collection extends throughout the widespread geographical area known as the State of Queensland, Australia. Survey data will be collected exclusively from classroom music teachers currently teaching music education in Education Queensland, Catholic Education and Independent schools. Given the size of the participant group (Gay et al., 2014) the survey used in Phase I of the explanatory sequential mixed methodology will be designed and distributed electronically via email, to all classroom music teachers throughout Queensland. Email and on-line “web-based electronic data collection” (Creswell, 2014a, p. 174) is deemed to be the most cost-effective and time-efficient data collection method given the expanse of the targeted geographical area. On-line distribution and the return of completed surveys will be managed electronically using the University survey server, which is deemed to
be the most secure online method whilst providing the most convenient method of receiving completed surveys. An online survey is also considered the most time efficient and cost efficient method of data collection and therefore the most appropriate for the circumstances. Other distribution methods include professional developmental conferences, networks and newsletters. Completed paper copies of the surveys will be made available at conferences and lodged in a labelled box to protect anonymity of participants. Those classroom music teachers reached through networks and newsletters will be given the link to the electronic survey, involving electronic lodgment of completed surveys. All surveys are returned to the researcher throughout the survey process and participants are able to contact the researcher either by email or through the university with enquiries regarding the survey. This extensive distribution of the survey aims to encourage a high response rate to increase “confidence with [the] findings as generalizable to the population” (Gay et al., 2014, 201). A response turn-around of two weeks will be allowed, which is considered to be sufficient time to receive and electronically return completed questionnaires to the researcher. After this time a reminder email will be sent again to all participants, to hopefully gain responses from further participants. This strategy will be repeated a number of times during the data collection period in order to encourage participation from classroom music teachers.

The importance of the survey instrument is imperative to the validity of the research. “Validity being defined as the degree to which the researcher has measured what he has set out to measure” (Smith, 1991, p. 106). For the sake of validity, 65.5% of the survey questions used in the research have been obtained from prior research surveys undertaken to ask classroom teachers about ICT. An international survey conducted by the Organisation for Economic Cooperation and Development (OECD) (2014) provided an opportunity for teachers and principals to provide responses to educational issues for future educational development in OECD countries. 23 countries participated in the survey entitled: Teaching and Learning International Survey (TALIS) (OECD, 2014). Survey questions within the OCED (2014) survey, that were relevant to this research topic, provided the basis of 27.5% of survey questions used in this survey. Another survey conducted by Elston (2013) commissioned by Cambridge
University, investigated the use of ICT in education. Educators from 10 countries responded, resulting in 519 being received in relation to educational issues such as: ICT policies and budget, ICT resources in students’ homes, teacher confidence, professional development, hardware and software resources and ICT usage in the classroom. Survey questions relevant to this research provided the basis of 24.1% of survey questions used in this survey. A further survey conducted in Tanzania by Mwalongo (2011) investigated teachers’ perceptions about the integration of ICT in education for the purposes of “teaching, administration and professional development” (Mwalongo, 2011, p. 36). 74 responses were received from teachers in response to questions about access to ICT hardware and software resources and usage. Survey questions relevant to this research provided the basis of 13.7% of the survey questions used in this survey. The remaining 34.4% of questions used in this research survey were designed by the researcher to collect information regarding: teacher experience, school demographics, educational providers, access to ICT hardware and software resources, use of ICT, pedagogies, challenges and barriers to using ICT, teacher confidence and professional development. Appendix K contains a copy of the Likert survey questions used in this research investigation.

3.6.1 Survey questions
By focusing on the lived experiences of classroom music teachers, the pursuit of intricately connecting the research to practical issues associated with incorporating ICT in music education, employs a line of questions designed to extract information privy to classroom music teachers and their knowledge of everyday practices of implementing ICT. These include questions such as: What ICT hardware do you have in your music classroom? What ICT software do you have in your music classroom? How do you define ICT? Does the classroom music have access to iPads? Do you receive ICT support during music lessons? Do you feel confident using ICT in your music program? How much professional development have you attended in the last 18 months? Although the general public and even some people within the education sector may consider these practical issues to be of a petty nature, all of these questions are based on background knowledge of being a classroom music teacher from both the researcher and from conversations with colleagues. These practical aspects have a subliminal influential power that
can either encourage a teacher to use ICT or not. For example, do classroom music teachers feel confident that they can call on ICT support during music lessons if laptops or iPads crash? If they do not have this support, does this affect their confidence in using ICT during lessons? Through the exploration of classroom music teachers’ lived experiences, this research hopes to discover the elements that contribute significantly to creating a positive ICT learning experience, which would consequently encourage teachers to embrace implementing ICT.

Explanatory sequential mixed methodology places significant importance on the Phase I survey questionnaire. A major consideration is the ability of the survey questions to produce relevant data to answer the research questions and provide a foundation for further investigations in Phase II. The correlation between the survey questions and the research questions has a major influence on the quality of the research and its ability to address the goals of the research. The validity of the survey is measured by its ability to produce relevant responses that address the research questions effectively.

Within Section A of the survey, the collection of Teacher Background Information is addressed by 17.8% of survey questions (see Appendix K). This section aims to collect data regarding the professional qualifications and musical backgrounds of the participant classroom music teacher. This information focuses on discovering the teaching and musical experiences of the participant to provide the researcher with a better understanding of the expertise of the participant. This also provides the researcher with information regarding the participant’s appropriateness of participating in the survey.

Section B of the research questionnaire focuses on collecting School Information comprised of 21.4% of the survey questions (see Appendix K). The questions focus on constructing an understanding of the school and the socio-economic status of the school. Aspects investigated include: demographic information of the school, the educational provider, the number of students within the school and the music resources provided by the school. The data collected, will address research questions concerned with quantifying the availability of music resources
and understanding the degree of school-level support offered to the music classroom and participants.

The majority of the research questions are situated in Section C of the quantitative survey (see Appendix K). This section consists of 42.8% of the survey questions and investigates the provision and utilisation of ICT in music education. Areas investigated in this section include: the perceived definition of ICT, what ICT resources are provided for the music classroom, the financial budget and ICT support provided by the educational provider, the frequency of utilisation of ICT hardware and software within the music classroom, effective pedagogies, the practical issues involved in incorporating ICT and the degree of teacher confidence felt when using ICT in the music classroom. The data collected aims to address a number of research goals including: quantifying the availability of ICT resources, discovering how teachers define the term ICT, identifying what school-level practices help or hinder teachers when implementing ICT, identifying current practices in music classrooms and evaluating how confident classroom music teachers feel about using ICT. This section provides a major contribution to the collection of survey data aimed at providing answers relevant to the research questions.

Section D of the survey contains 17.8% of the survey questions which investigate the issue of Professional Development (see Appendix K). This section investigates the frequency of professional development attended by participants, the provision of ICT resources to practise learnt skills, reasons for non-attendance of professional development and participants’ ideas for proposed professional development activities. Data collected aims to answer the research question concerned with identifying what professional development would be beneficial to classroom music teachers for implementing effective ICT in their music classroom.

The survey consists of closed and open-ended questions. Participants respond to closed questions in the survey by selecting prescribed response choices offered by the researcher. Within the research survey, 89.2% of the survey questions are closed questions. The closed questions were “easy to convert to the numerical format required for IBM SPSS” (Pallant, 2013,
which enables a convenient method of data summary for the large number of participants involved in the survey. Despite the convenience of closed questions which allows the participants to choose from a selection of prescribed responses, a researcher “cannot guess all the possible responses that respondents might make – it is therefore necessary to use open-ended questions. The advantage here is that respondents have the freedom to respond in their own way, not restricted to the choices provided by the researcher” (Pallant, 2013, p. 8).

To allow for the free expression of teacher perceptions in response to survey questions a total of 60.7% open-ended questions are provided in the survey. Also, throughout the survey, 53.5% of survey questions are designed to collect both closed and open-ended responses. This allows for participants to express their teaching experiences and perceptions beyond those suggested by the researcher. The use of both closed and open questions to collect teachers’ perceptions relevant to the research goals, allows greater understanding of the experiences of classroom music teachers throughout Queensland.

According to Kumar (2014), a research survey instrument is considered to be reliable “if [the] research tool is consistent and stable, hence predictable and accurate” (p. 215). The degree of reliability of the survey is demonstrated by “the extent that repeated measurements made by it under constant conditions will give the same result” (Moser & Kalton, 1989, p. 353). The consistency of the research instrument is demonstrated by its ability “to produce consistent measurements…when you collect the same set of information more than once using the same instrument and get the same or similar results under the same or similar conditions” (Kumar, 2014, p. 216). To test that the questionnaire will collect relevant information, the survey will be trialled by educational peers for consolidation, feedback and validation. This “pilot-test” (Pallant, 2013, p. 9) of the survey, will give the researcher insight into how the classroom music teachers would interpret and answer the survey questions. This guided adjustments to the survey prior to the distribution process.
By restricting the distribution of the Likert survey to classroom music teachers throughout Queensland who share exclusive professional knowledge regarding classroom music teaching, the element of confusion with the interpretation of questions will be eliminated. This strategy increases the collection of valid responses (Pallant, 2013). For this reason the relevance of the survey questions are applicable to the participant group and results in consistent responses from the participants. Similarities in professional knowledge and responses support the reliability of responses to the quantitative survey research tool.

3.6.2 Interview questions

Phase II semi-structured interview questions (see Appendix L) will be based on the identified themes from Phase I. The identified themes highlight current issues and organisational practices, which classroom music teachers perceive to positively and negatively influence their ability to incorporate ICT in their classroom music programs. Semi-structured interview questions will be designed to develop a greater understanding of the lived experiences of classroom music teachers as they help to answer the research question and sub-research questions guiding this study. Findings collected from the Phase II semi-structured interviews aim to collect comparative data so that differences between the educational providers can be determined, as well as differences between primary and secondary music departments within those educational providers can be recognised. A total of seven participants will attend interviews, representing three educational providers from both primary and secondary schools. Participants who attend the semi-structured interviews will represent the following schools:
<table>
<thead>
<tr>
<th>Number of participants</th>
<th>Educational Provider</th>
<th>Year levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Independent Education</td>
<td>Primary (P-6) classroom music teacher</td>
</tr>
<tr>
<td>One</td>
<td>Catholic Education</td>
<td>Primary (P-6) classroom music teacher</td>
</tr>
<tr>
<td>Two</td>
<td>Education Queensland</td>
<td>Primary (P-6) classroom music teachers</td>
</tr>
<tr>
<td>One</td>
<td>Independent Education</td>
<td>Secondary (7-10) classroom music teacher</td>
</tr>
<tr>
<td>One</td>
<td>Catholic Education</td>
<td>Secondary (7-10) classroom music teacher</td>
</tr>
<tr>
<td>One</td>
<td>Education Queensland</td>
<td>Secondary (7-10) classroom music teacher</td>
</tr>
</tbody>
</table>

Table 4. Semi-structured interview participants.

The specific schools chosen to participate in the semi-structured interviews will be chosen according to their close representation of the common trends identified in the survey data analysis. For the participants' convenience and in appreciation for their time, all semi-structured interviews will be conducted at the participants' school with permission from their school Principal.

All interview participants will be classroom music teachers who are currently responsible for implementing ICT in the music classroom and for this reason are considered to be significant contributors to this investigation, as owners of unique knowledge relevant to this study. The selection of a small number of classroom music teachers will be chosen to represent a larger participant population, to add greater understanding and explanation to responses received from the survey data. This nested-sampling design employed “one or more members of the subgroup [to] represent a sub-sample of the full sample” (Onwuegbuzie & Leech, 2007, p. 246).

The one-to-one semi-structured interviews conducted with classroom music teachers, aim to “develop emergent themes, to assess...relevance and meaningfulness of themes; to refine ideas; and to identify conceptual boundaries” (Onwuegbuzie & Leech, 2007, p. 246). In doing so, it is hoped that the qualitative field texts will provide insight behind responses collected in
the Phase I survey data. Such insight will increase understanding of the issues being researched, by discovering a deeper dimension owned within teachers’ perspectives.

3.7 Data Analysis
As suggested by Lambert (2012) the overall plan for data analysis of this explanatory sequential mixed methods research strategically follows the following stages: Analysis of Phase I, Analysis of Phase II, and Relating Phase I and Phase II. The analysis of quantitative survey data in each phase will undergo a process of three stages including: “counting to identify frequency distribution (how frequent an element occurs), separating out to identify cross-tabulation (frequency of occurrence associated with different groups) and comparing the correlation (relationships or patterns) between groups of data” (p. 163).

3.7.1 Phase I
The analysis process for explanatory sequential mixed methods includes both quantitative data analysis in Phase I and qualitative field text analysis in Phase II. The ability to effectively analyse data from both quantitative and qualitative genres represents an issue of contention, with some researchers believing that this cannot be effectively achieved and mixed methods researchers should focus on mastering one methodology (Johnson & Onwuegbuzie, 2004). When you consider the overall reason for conducting any research, it becomes apparent that the analysis of data is very important and “the reason for doing research is to produce interesting and valuable findings, drawn from collected data and which answer pre-determined research questions. Analysis...allows you to produce conclusions and recommendations to inform professional practice and continuing research” (Lambert, 2012, p. 161). Although time consuming, the analysis of the data is the foundation “to generate findings [and] the answers to [the] research questions” (Lambert, 2012, p. 29). To provide accurate analysis and ultimately answer the research questions, the involvement of analytical expertise for each genre may be necessary to ensure the validity of the research.
As detailed in Table 3, the quantitative data collected during the Phase I Likert survey will be used to “yield numbers that can be statistically analyzed, [and] produce results to assess the frequency and magnitude of trends” (Gay et al., 2014, p. 565). The researcher uses survey research data to “generalize from a...population so that inferences can be made about some characteristic; attitude, or behaviour of this population” (Creswell, 2014b, p. 157). In order to achieve this, the statistical data will be analyzed in two ways to increase the accuracy of analysis. This includes manual analysis using an excel spreadsheet and SPSS analysis which also enables two-way ANOVA (Field, 2009). ANOVA assists with thematic analysis, which codes responses according to “patterns in the responses provided” (Gay et al., 2014, p. 202). ANOVA will be used to test for statistical significant differences between means (for groups or variables) and groups (Statsoft, 2015) as well as provide a summary of comparative trends which forms the basis of inferences and generalized statements, “central tendency (mean, mode, median), variability (variance, standard deviation, range) and relative standing (z score, percentile ranks)” (Creswell, 2014a, pp. 203-205) as applicable to the participants surveyed. Analysis of the quantitative data may identify differences between groups and correlated themes and provide the basis for further in-depth qualitative investigations in Phase II.

The Likert scale survey, or summated rating scale, is an attitudinal scale that is “based on the assumption that each statement on the scale has equal attitudinal value...in terms of reflecting an attitude towards the issue in question” (Kumar, 2014, p. 204). The assumption of equal value is the main limitation of the Likert scale, given that the results show the “strength of a respondents view in relation to that of another and not the absolute attitude” (Kumar, 2014, p. 204). The measure of intensity of participants’ attitudes is refined to a five-point categorical scale (Kumar, 2014). The Likert scale to measure closed question responses, will measure “three-directional categories [of] positive, negative and neutral positions in the study population, with respect to the their attitude towards the issue under study” (Kumar, 2014, p. 205). Open-ended responses received by participants will be “summarized into a number of different categories for entry into IBM SPPS. [The categories will be] identified after responses [are] collected and received” (Pallant, 2013, p. 8).
Following the distribution and collection of the Phase I survey, each category will be assigned a numerical value of 1 to 5 according to the positivity or negativity of the question:

For a positive statement, the response indicating the most favourable attitude [was] given the highest score. For example, on a five-category scale, 5 [was] assigned to the response that indicated the most favourable attitude and 1 to the response which indicates the least favourable attitude. By contrast, a person who agreed strongly with a negative statement indicated that s/he does not have a favourable attitude; hence the scoring is reversed. (Kumar, 2014, p. 206)

Numerical values will be assigned to each survey response, to give a summative numerical value known as an attitudinal score. The attitudinal score highlights those participants with an overall more positive response to the issues being investigated. Following the identification and elimination of non-discriminative items, interview questions based on selected results will be constructed for qualitative interviews. This quantitative process provides a measurement and quantification of “how many people have a particular attitude, the intensity of a particular attitude, or overall...attitude of a person” (Kumar, 2014, p. 209). A quantitative survey is used to “measure the intensity of participants’ attitudes towards a particular issue” (Kumar, 2014, p. 209). Upon completion of the quantitative data analysis, areas requiring further investigation are then used to inform qualitative questioning in Phase II. Through the use of qualitative research, “the diversity of the attitudes rather than their intensity” (Kumar, 2014, p. 209) are explored through semi-structured interviews.

3.7.2 Phase II
The qualitative data collected during phase II semi-structured interviews will be processed according to the qualitative data analysis method known as IPA. The theoretical framework of IPA is derived from phenomenological hermeneutics. From the traditions founded by Husserl, phenomenology uncovers meaning. From the traditions founded by Dilthey, hermeneutics aims to understand and interpret meaning. IPA emphasises “the interpretative role of the researcher” (Joseph, 2014, p. 149) and allows the researcher to focus on finding deeper
meaning (Joseph, 2014). IPA employs a two stage interpretation process, labelled double hermeneutics (Smith, 2011), where “the researcher is trying to understand the participant’s subjective experience as well as trying to scrutinize the underlying meaning” (Lawson & Wardle, 2013, p. 86). This also recognises “the ideas of the researcher through a process of interpretation” (Joseph, 2014, p. 146). IPA is considered “interpretative rather than descriptive, IPA accepts participant’s stories, albeit in a questioning way” (Pringle, 2011, p. 21), whilst being sensitive to influences shaping the participant’s perception of life experiences. Which brings us back to work-system and lifeworld [Husserl (1954), Habermas (1987), Kraus (2015), Mertens (2005) and Alveson and Willmott (2012)]. Accuracy strategies will be used to recount experiences, for validity to thematic analysis and pattern coding (Gay et al., 2014). Analysis will be processed manually using Excel and involves thematic pattern coding and frequency analysis. This will inform the study of trends within the data and support the Phase 1 data through correlation. “Studies based on IPA focus on examining how individuals make meaning of their life experiences. A detailed analysis of personal accounts followed by presenting and discussing the generic experiential themes is typically paired with the researcher’s own interpretation, which is an expression of double hermeneutics in practice” (Pietkiewicz & Smith, 2012, p. 361).

3.7.3 Relating Phase I and Phase II
Following the quantitative and qualitative data analysis, a third stage of mixed methods data analysis process needs to take place. According to Tashakkori and Teddlie (2003) a seven-stage mixed methods data analysis process includes the following steps: “(a) data reduction, (b) data display, (c) data transformation, (d) data correlation, (e) data consolidation, (f) data comparison, and (g) data integration” (p. 22). This process involves a data reduction of quantitative data into “descriptive statistics, exploratory factor analysis, cluster analysis [and qualitative data into] exploratory thematic analysis, memoing” (p. 22). The display of data may be presented using quantitative tables and graphs and qualitative “matrices, charts, graphs, networks, lists, rubrics, and Venn diagrams” (p. 22) to assist with a narrative explanation of quantitative data and the conversion of qualitative data into statistics. The correlation and
consolidation of both quantitative and qualitative data, facilitates the comparisons of data to draw conclusions from integrated data. Through this process, the research findings are a product of both quantitative and qualitative data analysis. By comparing the data and identifying inferences, the depth of understanding produced by this process is increased and the research questions may be answered with the truth.

3.8 Data Interpretation

The role of the researcher is a contentious issue in mixed methods. It is my intention to approach data analysis respecting the traditions of quantitative and qualitative analysis and then use pragmatism as an overall umbrella to discover the truth.

During Phase I, the quantitative data analysis requires that the researcher remains disconnected from bias. According to the “quantitative positivist school of thought, educational researchers should eliminate their biases, remain emotionally detached and uninvolved with the objects of study, and test or empirically justify their stated hypotheses” (Johnson & Onwuegbuzie, 2004, p. 14). This detachment gives validity to the unbiased nature of quantitative results. In contrast to this, Phase II features the qualitative school of thought which considers reality to be personal experiences and interpretations constructed within the holistic reality of the participant’s life experiences. Where the role of the researcher is to admit personal biases and “interpret the meaning of the information, drawing on personal reflections and past research” (Creswell, 2014a, p. 10), so that the researcher may gain a deep understanding (Gay et al., 2014, p. 425) of the situation being investigated.

As a researcher interpreting data, I feel that the process of detaching myself from quantitative data analysis is achievable due to the nature of an online survey, however my current role as a classroom music teacher in Queensland may influence my bias and interpretation of qualitative field texts. According to Johnson and Onwuegbuzie (2004), “human beings can never be completely value free, and that values affect what we choose to investigate, what we see, and how we interpret what we see” (p. 16). Whilst acknowledging the source of my bias, I intend to
ensure I understand the intentions of individual participants and see my background not as a bias but as insight into understanding participants’ meaning whilst exploring the truth.

3.9 Validation

To ensure the validity and trustworthiness of this mixed methods research investigation, the combination of qualitative and quantitative methodologies enables triangulation. Triangulation is “a technique often used to establish credibility...It involves using more than two perspectives to determine the accuracy of some aspect of the study. It typically refers to concurrently using multiple data sources...or other research methods” (Holosko & Thyer, 2011, p. 130). In this research, triangulation will be attained through the combination of quantitative and qualitative methods. Qualitative field texts in Phase II will be used to consolidate and validate themes identified in the quantitative survey data in Phase I. Through the collection of data from a variety of sources, in particular survey questions and semi-structured interviews, triangulation provides an opportunity for cross-validation through data comparisons and verification (Oliver-Hoyo & Allen, 2006). Other techniques employed in this research that help increase the accuracy of data recollection and representing the truth, include the use of voice recordings to support the accuracy of findings (Hartwig, 2014) and the “inferences drawn from data” (Freeman et al., 2007, p. 25).

3.10 Limitations

One identified limitation of explanatory sequential mixed method design involves the significant responsibility placed on the identification of thematic trends from the Phase I survey data. Careful analysis of data is required to ensure that findings are accurate.

Once the thematic trends have been identified, another limitation is found in the selection of interview participants who could enlighten reasoning behind a particular trend that the researcher may be keen to investigate further. The anonymity of the survey means that the identity of those participants who contribute to the trend are not identifiable and therefore
unable to be included as an interview participant. This means that an in-depth investigation into a particular trend is not deliberate, but only possible by chance encounter.

3.11 Ethics
Following the receipt of ethics approval from Griffith University (see Appendix A), applications to conduct research in Queensland schools includes correspondence to all educational authorities in Queensland and regional offices, according to their individually prescribed procedures. This includes: STRATPOL, which is the overall authority for the Department of Education in Queensland (see Appendix B) and Catholic Education Dioceses in Queensland including: Brisbane (see Appendix C), Toowoomba (see Appendix F), Townsville (see Appendix G), Rockhampton (see Appendix E) and Cairns (see Appendix D). Once permission has been received, applications for approval to approach classroom music teachers will then be submitted to all Department of Education State Schools in Queensland and all Catholic Schools in Queensland. Independent Schools and Religious Instruction Catholic School require individual correspondence occurring directly with school principals to ask for permission. Following the email correspondence with all school principals in Queensland, the school principals will be responsible for passing on the email to classroom music teachers if they grant their approval.

3.12 Summary
This methodology chapter has discussed the suitability of the overarching philosophical framework of pragmatism to find the underlying truth and effect change. Within the mixed methodology of explanatory sequential mixed methods this research investigation will explore the lived experiences of classroom music teachers to gain insight into current issues associated with incorporating ICT in music education, through the utilisation of a Likert scale survey and semi-structured interviews. Questions designed to investigate the availability of ICT resources and support, teacher confidence, current teaching practices and professional development, aim to gather information to effectively answer the research question and sub-research questions. Analysis utilising SPSS, ANOVA and IPA allow the research to interpret findings and compare teachers’ perceptions between educational providers in Queensland. Considerations of
validation, limitations and ethics are also noted. Through the mixed methodology outlined in this chapter, it is intended that this research will collect perceptions of classroom music teachers lived experiences to increase an awareness of the everyday issues surrounding the implementation of ICT in the music classroom.
Chapter 4: Results - Quantitative Analysis

4.1 Introduction
The results presented in this chapter are the findings of the quantitative survey, which was made available to all classroom music teachers throughout Queensland Australia, for a period of six months from January 2017 to July 2017. During that time 280 voluntary survey responses were collected. The survey (Appendix K) included twenty-nine questions comprised of researcher generated questions as well as questions from previous research surveys (Elston, 2013; Mwalongo, 2011; OECD, 2014). All questions addressed the primary research question: What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program? The twenty-nine questions were presented under four headings denoting the four main areas of enquiry: teacher background information, school information, ICT in music education and professional development. These areas of enquiry were designed to address the following sub-research questions which emerged and guided the project:

1. What are teachers’ perceptions of what ICT in music means?
2. What resources do classroom music teachers currently have access to?
3. How do classroom music teachers currently incorporate ICT into their music programs?
4. How confident do classroom music teachers feel about using ICT in their music programs?
5. What professional development do classroom music teachers feel will help them incorporate ICT into their music programs effectively?
6. What practices may enhance the implementation of ICT in music education?

4.2 Analysis of survey
4.2.1 Teacher background information
Of the total survey respondents (N=280) 84% identified as female and 16% male. Respondents were then asked to indicate the number of years they had been employed as a classroom music
teacher, as shown in Figure 3. This question was to determine the professional experience of the survey respondents and understand the value of their professional perceptions being collected in the survey. The survey data indicated that 24% of respondents had been employed as a classroom music teacher for 0-5 years, 21% for 6-10 years, 17% for 11-15 years, 8% for 16-20 years and 24% had been employed for over 20 years. 3% of teachers did not specify their employment duration.

The survey asked teachers to indicate their formal music qualifications, as shown in Figure 4. In Queensland, classroom music is a specialist subject area employing specialist music teachers with varying levels of musical proficiency as well as a minimum 4 year education tertiary degree containing music courses and educational courses. The aim of this question was to determine the professional musical expertise of respondents. The survey data indicated 0.8% had completed musical study overseas, 53% had completed Australian Music Examinations Board (AMEB), Associated Board of the Royal Schools of Music (ABRSM), Australian and New Zealand Cultural Arts (ANZCA) or Trinity College London (Trinity) exams, 18% had completed a Diploma, 64% had completed a Bachelor degree, 13% had completed a Master’s degree, 0.7% had
completed a Doctorate, 8% had completed other qualifications such as Australian Kodaly Certificate, an Orff Certificate, Graduate Diploma or Graduate Certificate and 5% of respondents indicated that they had no formal music qualification.

Respondents were given a list of musical activities and asked to indicate those activities they had participated in, which had contributed to their musical background, as shown in Figure 5. This question aimed to identify the musical proficiency of classroom music teachers in Queensland. The survey data found that 89% play an instrument; 55% play in a music group/ensemble or orchestra; 34% teach an instrument; 3% tour with a music artist; 14% are professional musicians; 43% are choral conductors; 26% conduct an instrumental ensemble; 15% compose; 5% accompany; and 11% actively participate in other musical activities.
4.2.2 School information

Classroom music teachers throughout Queensland were asked to indicate the location of the school where they currently teach. This question was designed to determine if the allocation of funding for ICT in music differed between Brisbane schools compared to non-Brisbane schools. The survey data showed that 48% of respondents’ schools are located within Brisbane suburbs and 51% are Non-Brisbane schools.

The survey was distributed to every school throughout Queensland which included all three Educational Providers: Independent Education, Catholic Education and Education Queensland. Of the total respondents (N=280), the survey data showed that 70% of respondents taught in Education Queensland, 17% Catholic Education and 13% Independent Schools.

Respondents were asked to identify the year levels taught at their school to determine if there was a significant difference between Prep to Year 10 (P-10) schools compared to those schools
with senior Year 11 and Year 12 students. The survey data identified 53% of schools as Prep-Year 6, 25% as Prep-Year 12, 1% as Year 5-Year 12 and 20% as Year 7-Year 12.

Survey respondents were asked to identify the number of students attending their school. This aimed to identify if the number of student enrolments contributed to ICT resources in music. The data showed that 32% have 1-500 students, 37% have 501-1000 students, 13% have 1001-1500 students, 4% have 1501-2000 students, 1% have more than 2001 students and 10% did not identify student enrolments at their school.

Respondents were asked to indicate where classroom music lessons were held. This aimed to determine the prioritised provision of an allocated music room and the availability of allocated space to store music resources and identify a barrier for teachers to implement ICT in music lessons. The survey data showed 77% of respondents were assigned a designated music classroom, 1% teach in the hall, 1% teach in the Out of School Hours Care room (OSHC), 4% walk around to the classrooms, 4% teach in other rooms including the library, donga, online, computer room, demountable, flexible space and the staff kitchen and 11% did not specify where they teach classroom music.

4.2.3 ICT in music education
The Australian Curriculum requires classroom music teachers to implement ICT resources (ACARA, 2010). To investigate how classroom music teachers define the term ICT and which resources they consider to be ICT, all survey respondents (N=280) were asked to select those resources they consider to be ICT from a given list. The aim of this question was to investigate teachers’ perceptions of what resources fulfil the definition of ICT in music, as prescribed by sub-research question 1. By identifying how teachers define the term ICT, the data will indicate if teachers need a clear definition of the term ICT to guide the choice of resources in music education to comply with the intentions of the Australian Curriculum. Figure 6 shows the percentage frequencies of the survey data, which identified those resources classroom music teachers believed to be ICT: 68% of respondents considered computers to be ICT, 68% iPads,
66% laptop, 65% smartboard, 56% smartphone/mobile, 44% recording studio, 40% projector, 32% electronic reader, 30% MP3, 26% camera, 17% DVD player, 15% television, 12% CD player, 10% electric drum kit, 8% whiteboard, 8% electric keyboard, 7% radio, 6% cassette player and 5% electric guitar.

This data showed the majority of respondents considered computers, iPads, laptops and smartboards to be ICT. Data percentages indicated percentage frequencies as well as adverse frequencies, for example, respondents considered computers to be ICT and adversely indicated that 31% do not consider computers to be ICT. No items on the given list received a 0% this indicated that respondents identified all items as ICT, even items such as the radio.
**4.2.4 Resources available in classroom music**

Classroom music teachers require a variety of resources to effectively deliver the curriculum. To investigate the availability of resources, respondents were asked to select resources from a given list to indicate the resources they have access to in their music room. The intent of this question was to collate an inventory of music resources found in Queensland schools, as an indicator of the prioritisation of music within schools, as prescribed by sub-research question 2. By identifying the resources available in classroom music, the data will show if teachers have the resources they need to teach the Australian Curriculum. Percentage frequencies of resources are indicated in Figure 7. The data identified the most common resources as untuned percussion, tuned percussion, whiteboard, piano and internet access and those resources supplied in the lowest frequency included ICT resources such as iPads, laptops, recording studio and synthesizers. The data indicated 84% of schools supply the music room with untuned percussion, 77% tuned percussion, 75% whiteboard, 73% internet access, 73% piano, 67% ukuleles /guitars, 63% CD player, 60% speakers, 59% projector, 49% keyboards, 46% Interactive whiteboard, 31% microphones, 26% electric guitars, 18% electric drum, 11% recording studio, 7% synthesizers and 15% of respondents indicated the school provided no resources and respondents have to provide their own resources.

Data percentages indicated the collective percentage frequencies of the three different providers as well as adverse frequencies. Percentage frequencies indicated 13% of schools provide iPads for the music classroom, this data adversely indicated that 86% of music classrooms do not have iPads to complete hands-on music curriculum activities. The data also indicated that 73% of schools provide internet access to the music room but ICT internet enabled devices such as iPads are provided with significantly less frequency.
ANOVA was used to identify possible correlations between educational providers Education Queensland, Catholic Education and Independent Education and the resources they provided to the music classroom. No correlation was identified with the supply of the following resources: electric guitars, microphones, laptops, synthesizers, interactive whiteboards and recording studios. However, significant correlations were identified between educational providers and the provision of a number of classroom music resources, shown in Table 5.
<table>
<thead>
<tr>
<th>Resources</th>
<th>F values</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>untuned percussion</td>
<td>F(2,277) = 4.026</td>
<td>p = .019</td>
</tr>
<tr>
<td>tuned percussion</td>
<td>F(2,277) = 3.730</td>
<td>p = .025</td>
</tr>
<tr>
<td>ukuleles</td>
<td>F(2,277) = 4.932</td>
<td>p = .008</td>
</tr>
<tr>
<td>keyboards</td>
<td>F(2,277) = 4.181</td>
<td>p = .016</td>
</tr>
<tr>
<td>electric drum</td>
<td>F(2,277) = 6.140</td>
<td>p = .002</td>
</tr>
<tr>
<td>projector</td>
<td>F(2,277) = 3.272</td>
<td>p = .039</td>
</tr>
<tr>
<td>speakers</td>
<td>F(2,277) = 3.750</td>
<td>p = .025</td>
</tr>
<tr>
<td>whiteboard</td>
<td>F(2,277) = 4.843</td>
<td>p = .009</td>
</tr>
<tr>
<td>iPads</td>
<td>F(2,277) = 4.239</td>
<td>p = .015</td>
</tr>
</tbody>
</table>

Table 5. Correlation between educational providers and resources.

In this correlation data the F value represents the variability between means (Field, 2009) and the correlation (p value) represents the level of confidence where p values less than .05 are significant and “the lower the p value, the greater the degree of confidence in the findings: a p value of .01...creates more confidence than a p value of .05” (Farlex & Partners, 2009, p. 1).

Figure 8 is a graphic representation of the correlation between educational provider and iPads, showing a 1.5% “chance that the results of the study occurred by chance” (Farlex & Partners, 2009, p. 1) resulting in a high level of confidence in this correlation, and the representation of this data is a true reflection of current practices. This data shows the prioritisation that individual educational providers place on the supply of iPads within their music classrooms.
The graphic curve shown in Figure 8 reflects the graphic curves of all significant correlations indicated by the data between the three educational providers and the quantity of resources each educational provider supplied for classroom music. Independent Schools consistently supplied classroom music with the highest quantity of resources, the Department of Education consistently supplied the lowest number of resources and Catholic Education supplied an adequate number of resources to maintain their position between Independent Education and Education Queensland in all correlations. Overall, the data indicated that Independent schools supply the most music resources and Education Queensland supplies the least number of music resources.

4.2.5 ICT schemes in schools
Some schools in Queensland offer an ICT scheme to increase the availability of ICT resources for students. The ICT scheme may require students to purchase an ICT device such as a laptop or iPad from the school, the school may own class sets of ICT devices and allow classrooms to use them, or the school may require the students to purchase their own device. These ICT schemes are adopted to increase the accessibility of devices for each student to enable the development
of individual ICT skills. To determine the availability of ICT devices within schools, respondents were asked to disclose the ICT scheme that provided laptops and iPads for students, currently in operation in their school. Percentage frequencies of ICT schemes are indicated in Figure 9. The data identified 40% of students use ICT devices owned by the school, 13% of students buy their own ICT device, 10% of students have no access to an ICT device, 4% buy their own ICT device through the school and 3% rent an ICT device through the school.

![Image: Pie chart showing percentages of ICT scheme]

**Figure 9. Student provision of ICT.**

An exploration of possible correlations was conducted using ANOVA to determine if educational providers rely on specific ICT schemes to increase the ratio between students and ICT device. No correlation was found in schools where students buy their own laptops or iPads and where the school hosts an ICT rental program. Figure 10 shows the significant correlation identified between educational providers and ICT schemes where students purchase ICT devices through the school. The data indicated 20% of students in Independent Education schools buy their own ICT device through the school, 8% of students in Catholic Education and 1% of students in
Education Queensland purchase their own ICT device through the school $F(2,277) = 14.163$, $p = .000$. The $F$ value indicated a high level of 14.163 mean dispersion (Field, 2009) and the $p$ value indicated a direct correlation with 0% chance this correlation occurred by accident (Farlex & Partners, 2009).

![Figure 10. Students purchase ICT through school.](image)

Further examination identified that Catholic Education had the most successful ICT scheme which provided ICT devices to students. As shown in Figure 11, 50% of Catholic Education students use laptops and iPads owned by the school, 44% of Independent Education students and the lowest percentage of 17% of Education Queensland students use laptops or iPads owned by the school $F(2,277) = 4.876$, $p = .008$. 

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Figure 12 shows the analysis of students with no access to laptops or iPads. The data identified that Education Queensland had the highest percentage of 43% of students who had no access to laptops or iPads, 34% of Independent Education students and 23% of Catholic Education students had no access to laptops or iPads F(2, 277) = 3.354, p = .036. From this data it is inferred that “students attending Catholic Education schools in Queensland are more likely to have access to ICT due to the schools ICT scheme where the school provides ICT devices to students” (Field, 2009). This data indicated that a significant number of Queensland students do not have access to an ICT device to develop proficiencies and skills.
4.2.6 Access to ICT resources in the music classroom

According to the Australian Curriculum, classroom music teachers are accountable for implementing ICT in music education (ACARA, 2010) and therefore require access to ICT resources to teach the Australian Curriculum. To determine the accessibility of ICT resources within schools, survey respondents were asked to select ICT resources from a given list, to indicate the ICT resources they have access to, for music education. The purpose of this question was to collate an inventory of ICT resources found in Queensland schools, as an indicator of the prioritization of supplying ICT resources for music in schools, as further investigation for sub-research question 2. By identifying the ICT resources available in music, the data will show if teachers have the ICT resources they need to teach the Australian Curriculum. Percentage frequencies of resources are indicated in Figure 13. 16% of respondents indicated they had no access to ICT for their music program, 12% relied on access to the school computer lab, 7% used the ICT resources in the school library and 1% indicated they had 16-40 ICT devices in the music room.
Figure 13. ICT accessibility.

An analysis using ANOVA was used to investigate a possible correlation between educational providers and establishing the statistical variation between suppliers, where respondents locate and access ICT resources within schools. Significant correlations were identified between educational providers and ICT resources being brought to the music classroom by each class. $F(2, 277) = 5.343, p = .005$ suggested a high level of confidence that showed a 0.5% chance that this correlation occurred by accident (Farlex & Partners, 2009), whilst the F value showed a dispersion of means (Field, 2009) of 5.343. As shown in Figure 14, the data identified that 29% of Independent Education students bring their own ICT to the music classroom, 19% of Catholic Education students and 10% of Education Queensland students bring their own ICT device to the music classroom.
Survey data presented in Figure 9 identified that 40% of students use laptops and iPads owned by the school. This percentage is high compared to the number of music rooms that own the ICT resources, that is, 7% own 1-15 iPads, 1% own 16-40 iPads, 5% own 1-15 laptops and 1% own 16-40 laptops, as shown in Figure 13. 16% of respondents indicated ‘no access to ICT’ in the music classroom, 12% accessed ICT in the computer lab and 7% in the library. Despite the mandatory implementation of ICT in music, the data indicated that 4% of music teachers provide their own ICT.

Overall, the data indicates that schools prioritise the supply of laptops and iPads to students for general classroom activities. ICT intended for shared utilisation is located in common areas within schools such as the computer lab or library. According to the data, only a small percentage of schools supply ICT specifically for the music classroom, with 16% of respondents indicating they rely on students to bring their iPad or laptop to music lessons. Notably, the data indicated only 4% of music classrooms always have ICT available in the music classroom, which adversely indicated 96% of music rooms do not have ICT available in the music room. Similarly, 7% of music rooms own 1-15 iPads but adversely 92% of music rooms do not own 1-15 iPads.
Overall, Figure 13 indicates percentages less than 16% which demonstrates that the accessibility of ICT for music programs is low throughout Queensland.

4.2.7 ICT support

In order for classroom music teachers to implement ICT in their music programs, the issue of ICT support is a reflection of organisational practices that can positively or negatively assist teachers to implement ICT. Survey respondents were asked to indicate who provides ICT support for the music classroom. The percentage frequencies indicated in Figure 15 identified that 56% of respondents indicated no-one provided them with ICT support and 38% had no access to ICT, only 5% receive ICT support from ICT support staff, 4% from the librarian, 3% rely on their own ICT abilities, 1% rely on friends/relatives and 1% rely on other teachers for ICT support.

![Figure 15. ICT support.](image-url)
4.2.8 *Incorporating ICT in classroom music programs*

The implementation of the F-10 Australian Curriculum: The Arts - music subject became mandatory in 2016. A significant feature of the curriculum was the inclusion of ICT, with its associated policies and educational expectations being stated within the General Capabilities of the Australian Curriculum. Following the mandatory implementation of ICT in music education, this section aimed to investigate sub-research question 3, to determine how classroom music teachers currently incorporate ICT into their music programs. Respondents were asked to indicate ICT hardware used in their music classroom. Figure 16 indicates percentage frequencies of the survey data of those resources which are used during most lessons, occasionally used and never used. The data showed that classroom music teachers rely predominantly on four resources which are used in most lessons and with the highest frequency: 51% use the laptop, 49% projector, 49% white board and 35% cassette player. The data indicated those resources used with the lowest frequency include: digital camera, iPad, CD player and smartphone. Survey respondents indicated those resources used with the highest frequency were favoured due to their trouble-free qualities. Resources that were reported as *never used* in the music program, as shown in Figure 16, were not provided by schools.
Respondents were asked to identify the ICT software they use in their music classroom. Figure 17 indicates percentage frequencies of the survey data of those software resources which are used during most lessons, occasionally used and never used. The data showed that classroom music teachers rely predominantly on online resources available via the internet. The highest frequencies indicated that 34% of respondents use YouTube\(^4\) in most lessons, 45% use educational websites, 43% subject specific websites and 39% use other internet/online resources were occasionally used in the music classroom. Respondents consistently indicated

\(^4\) YouTube - Internet based website for the global sharing of tutorials, videos, music and information.
those software resources used in *most lessons* and *occasionally used* in music lessons were resources which they had experienced no problems using and they considered to be trouble-free. A significant number of resources were never used in the music program because they were unavailable and teachers were unfamiliar with using them.

![ICT software usage graph](image)

**Figure 17.** ICT software usage.

Overall, a consistent pattern of hardware and software usage emerged from the data, which indicated classroom music teachers use a limited number of ICT resources based on teacher familiarity and reliability. The need for teachers to use familiar and problem-free resources is an immediate reflection of practical necessity, since data indicated in Figure 15 identified significant deficiencies in ICT support being provided for classroom music teachers.
As shown in Figure 7, 73% of classroom music teachers have internet access in the music classroom, adversely the remaining 26% of classroom music teachers are without internet access. In contrast, Figure 16 identified that classroom music teachers predominantly use a laptop, projector and whiteboard in most lessons to access online resources such as YouTube via the internet, as seen in Figure 17. Due to a lack of availability and familiarity, the data showed that no other ICT was used in music classrooms. Classroom music teachers indicated their software resources were predominantly sourced from online sites reliant on internet. The data indicated that teachers rely on pedagogies that use relatively few ICT resources, specifically, a laptop, whiteboard, projector and internet. The data indicated that 75% of teachers use YouTube to provide the music classroom with online information resources, as well as to conduct the explicit teaching of music theory skills and model concepts to the whole class, 33% indicated they had no ICT access, 28% use ICT to record for assessment accountability and 20% use ICT to compose and perform with students. This data supports the indication that respondents predominantly use a laptop, whiteboard, projector and internet for whole class teaching.

Data indicating that classroom music teachers use ICT to access internet resources is further supported by percentage frequencies, shown in Figure 18. Respondents were asked to indicate how they use ICT in the music classroom. The aim of this question was to identify pedagogies incorporating ICT in music and further investigate sub-research question 3. The data indicated that the majority of respondents use ICT to provide the music classroom with online information resources, conduct lesson preparation and for administration purposes.
4.2.9 Confidence levels of classroom music teachers when implementing ICT

The implementation of ICT in music is mandatory and the professional responsibility of classroom music teachers (ACARA, 2012b). To consider if classroom music teachers feel confident that their personal ICT skills are adequate to implement ICT and probe sub-research
question 4, the survey asked respondents to identify their level of confidence when using ICT in both personal and professional tasks. As shown in Figure 19, a combination of the strongly agreed and agreed responses showed that the data identified 61% felt confident using ICT for personal use, 53% felt confident using ICT for administration, 48% felt confident using ICT when teaching classroom music and 41% felt confident using ICT whilst doing Professional Development.

![Teacher confidence chart](image)

Even though 48% of respondents indicated that they felt confident using ICT in the classroom, which adversely means 51% of classroom music teachers are not confident using a variety of ICT resources. The level of confidence indicated in the data may be elevated, since the survey data previously identified that classroom music teachers predominantly use familiar and problem-free ICT. Reliance on a select number of hardware and software ICT resources may
have directly influenced the level of confidence indicated by respondents in relation to using ICT in the music classroom. It is reasonable to suggest that whilst teachers continue to use a restricted choice of ICT, that is a laptop, projector and internet, it does not demonstrate that teachers are confident utilising a large range of ICT in the classroom as intended by the Australian Curriculum.

Teachers’ professional perceptions were sought to investigate what classroom music teachers need to increase their ICT confidence and willingness to implement ICT in the music classroom. Respondents were asked to choose from a given list and identify strategies that would increase ICT confidence. The aim of this question was to collate the professional needs of classroom music teachers and investigate sub-research question 5. By calculating the combination of the strongly agreed and agreed responses, percentage frequencies shown in Figure 20 show that 62% of respondents indicated a need for time, 60% need access to music software, 57% need ICT for professional development, 56% need access to appropriate ICT resources to practise ICT skills, 53% need support to maintain ICT, 52% need support to set up ICT and 46% need support when using ICT in the classroom.
4.2.10 Professional development

Respondents were asked to indicate whether they felt their tertiary qualification included ICT training relevant to implementing ICT in the music classroom according to the Australian Curriculum. The aim of this question was to determine the relevance of ICT training in university. 9% of respondents indicated their tertiary qualification included ICT training relevant to implementing ICT in the music classroom according to the Australian Curriculum. The remaining 90% indicated their tertiary education was inadequate. Of the total respondents (N=280), 25% of respondents had 0-5 years teaching experience, representing a large number of teachers recently completing tertiary study which is reflective of current tertiary education.
Respondents were asked to indicate the number of professional development days they had attended in the previous 18 months. This question was used to determine the number of days teachers engaged in professional development relevant to implementing ICT in music. Figure 21 show that 68% of respondents indicated they had attended no music specific ICT professional development in the last 18 months, 18% attended 1 day and the remainder of respondents had attended up to five days.

![Graph showing professional development days attended](image)

**Figure 21. Professional development days attended.**

Analysis using ANOVA was conducted to identify possible correlations between teachers who agreed that their tertiary education adequately prepared them for implementing ICT in the music classroom compared to the number of professional development days respondents attended. The data identified that significant correlations exist between teachers’ perceptions of tertiary readiness and attending professional development relevant to implementing ICT $F(4,274) = 6.291, p = .000$. This analysis identified that even if a teacher’s tertiary education had
not helped adequately prepare them for implementing ICT in the music classroom, the fact that teachers had attended professional development relevant to implementing ICT, the teachers perceived that the tertiary education had helped them.

Queensland College of Teachers (QCT), as the Teacher Registration body, requires teachers to attend a prescribed number of professional development hours relevant to their employment status within a five year registration period, to maintain registration. Respondents were asked to indicate if they wanted to attend professional development relevant to implementing ICT in music. 87% expressed a desire to attend more professional development and 32% felt that the professional development on offer was unsuitable. The irrelevance of professional development is supported by data presented in Figure 13, which indicated that 8% of classroom music teachers have 1-15 iPads and 1% has 16-40 iPads in the music classroom. This deficiency of resources renders iPad professional development as irrelevant for those classroom music teachers who do not have an iPad and therefore cannot practise iPad skills learnt in professional development.

11% of respondents indicated they had ICT resources to practise the ICT skills learnt during professional development. Further investigations were undertaken using ANOVA to identify correlations between teachers who had attended professional development relevant to implementing ICT and those teachers possessing appropriate ICT resources to practise ICT skills learnt during professional development. The data identified a significant correlation between professional development and having access to ICT resources to practise skills F(7,271) = 25.989, p = .000. This correlation data supports the need for teachers to have ICT resources since those who attended professional development were restricted in their opportunity to follow-up with ICT practise and implementation. The analysis also showed that those schools budgeting for the most professional development provided the least amount of resources for practise opportunities to retain professional development skills. Conversely, the data also showed those teachers who attended professional development with higher frequency had fewer resources to practise skills learnt during professional development.
4.2.11 Practices to enhance the implementation of ICT in the music education

Classroom music teachers were asked to indicate what they perceived to be the challenges or barriers associated with using ICT in their music program. Figure 22 shows the combined data values of strongly agreed and agreed responses which indicate those barriers to be: access to adequate ICT resources for classes 51%, funding for ICT 46%, access to ICT resources 45% and ICT not working 40%. According to this data, teachers recognised the need for access to adequate ICT resources, ICT funding and ICT support, so they may be helped to implement ICT and encourage pedagogical change suited to hands-on experiences.
Figure 22. Challenges to implementing ICT.
4.3 Summary of quantitative data

Using the following labels: teacher background information, school information, ICT in music education and professional development, the survey data results have provided the researcher with perceptions of classroom music teachers to address the research questions. Important issues that were identified within the data included: the need for a definition of the term ICT within the P-10 curriculum to ensure purchases and resources used within the music program fulfil curriculum intentions; teachers limit their repertoire of ICT resources due to availability, familiarity and reliability; there is a lack of ICT support for classroom music teachers; teacher confidence is directly affected by professional development opportunities and the availability of ICT resources; and professional development opportunities are short-term when ICT resources are inadequate. Classroom music teachers identified that the most significant barrier that negatively affects their ability to implement ICT in the music program is the need for access to adequate numbers of ICT resources, ICT funding and ICT support.
Chapter 5: Results - Qualitative Analysis

5.1 Introduction

The results presented in this chapter are the findings of the qualitative semi-structured interviews, involving a nested sample of seven classroom music teachers throughout Queensland Australia, held between August 2017 and December 2017. The initial intention was to conduct six semi-structured interviews during that time, however a seventh participant from P-6 Education Queensland requested to be included in the interviews resulting in seven interviews being conducted. As a result, seven classroom music teachers participated in semi-structured interviews including: two P-6 classroom music teachers from Education Queensland, one P-6 classroom music teacher from Catholic Education, one P-6 classroom music teacher from Independent Education, one 7-12 classroom music teacher from Education Queensland, one 7-12 from Catholic Education and one 7-12 Independent Education, as listed in Table 6.

<table>
<thead>
<tr>
<th>Code</th>
<th>Educational Provider</th>
<th>Year Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE:P-6</td>
<td>Independent Education School</td>
<td>Prep - Year 6</td>
</tr>
<tr>
<td>CE:P-6</td>
<td>Catholic Education School</td>
<td>Prep - Year 6</td>
</tr>
<tr>
<td>EQ:P-6a</td>
<td>Education Queensland School</td>
<td>Prep - Year 6a</td>
</tr>
<tr>
<td>EQ:P-6b</td>
<td>Education Queensland School</td>
<td>Prep - Year 6b</td>
</tr>
<tr>
<td>IE:7-10</td>
<td>Independent Education School</td>
<td>Year 7 - Year 10</td>
</tr>
<tr>
<td>CE:7-10</td>
<td>Catholic Education School</td>
<td>Year 7 - Year 10</td>
</tr>
<tr>
<td>EQ:7-10</td>
<td>Education Queensland School</td>
<td>Year 7 - Year 10</td>
</tr>
</tbody>
</table>

Please note that Prep Year in Queensland is equivalent to Foundation Year.

Table 6. List of interview participants.

Each interviewee was asked 13 researcher generated questions. The findings of the field texts have been presented using alias identities (Onwuegbuzie & Collins, 2007) to protect the anonymity of volunteer participants, as listed in Table 6.
The intention of the interview questions was to gather further information to formulate a deeper analysis of the issues raised by classroom music teachers regarding teachers’ perspectives about implementing ICT in music education. For this reason the interview questions were based on data collected from the survey. Semi-structured interview questions included (also see Appendix L):

| Question 1 | What ICT resources do you currently have access to at your school? Are those resources available for use at all times in the music room? |
| Question 2 | Who provides ICT support at your school? |
| Question 3 | Are there any issues/problems that hinder you from implementing ICT in your music room? |
| Question 4 | What helps you use ICT in your music room? |
| Question 5 | What does the term ICT mean to you? Can you give a definition? |
| Question 6 | How do you feel about making requests for ICT resources for music? |
| Question 7 | What items are on your ‘wish list’ for ICT resources that you would like to be able to access? |
| Question 8 | How do you currently incorporate ICT into your music program? Can you give an example of how you use ICT in your classroom? |
| Question 9 | Does your music program engage students in hands-on activities with the necessary equipment to use or do you model activities on the screen? |
| Question 10 | Do you feel confident using ICT in your music program? Why do you think that is? |
| Question 11 | What Professional Development would you like to assist you to incorporate ICT into your music program effectively? |
| Question 12 | What do you think the Australian Curriculum is asking you to do with ICT in music? Do you think this is reasonable? Is this possible in your school? Why? Why not? |
| Question 13 | Is there a difference between your ideas and reality? Why? |

Table 7. Interview questions.
5.2 Analysis of semi-structured interviews

5.2.1 Resources available in classroom music

Participants were asked to indicate the ICT resources currently available within their music classroom. This question was based on the understanding that it is imperative for classroom music teachers to have suitable resources in adequate quantities, so they may effectively teach the Australian Curriculum, as prescribed by sub-research question two. Participant responses supplied by P-6 classroom music teachers identified the following concerns regarding resources available in the P-6 music classrooms: internet connectivity is unreliable, a lack of accessibility to ICT resources, interactivity of the whiteboard, not all teachers are supplied with a school laptop, all participants had to purchase their own iPads for school use and purchasing software or finding free internet programs. Participant responses supplied by 7-10 classroom music teachers regarding ICT resources available in the 7-10 classrooms identified the benefit of Bring Your Own Device (BYOD), internet reliability, the supply of teacher laptops, and availability of computers in the music classroom, software and keyboards.

Field texts collected from P-6 classroom music teachers identified that all participants teach music in classrooms with internet access. Independent Education: Prep to Year 6 (IE:P-6) had encountered problems with internet connection in previous years which were exacerbated by a fully concrete room, however this has been overcome by the installation of NBN and WiFi. Catholic Education: Prep to Year 6 (CE:P-6) rarely experienced internet outages. The Education Queensland: Prep to Year 6a (EQ:P-6a) music teacher only acquired the internet one week prior to the interview in Term 4 2017 in preparation for the participant to teach the amalgamated Arts curriculum and had not used the internet by the time of the interview. Education Queensland: Prep to Year 6b (EQ:P-6b) recalled frequent internet outages. IE:P-6, CE:P-6 and EQ:P-6b all commented on the value of internet based resources. Access to ICT devices was varied since IE:P-6 had a one-to-one iPad scheme and Years 1-6 students brought their own iPads to music lessons. CE:P-6 also had a one-to-one device scheme where P-3 students had iPads and Years 4-6 had Windows laptops however classroom teachers refused to allow devices to be taken to music lessons. EQ:P-6a was denied access to iPad borrowing due to the
Principals’ prioritisation of classroom teachers over music. EQ:P-6b was informed she had to teach music every Thursday without a classroom, for this reason the participant was granted permission to book the computer lab every Thursday resulting in a 1:1 ratio of computer per student, she also had the capacity to borrow 1:2 iPads from the library. Participants identified ICT resources within their music classroom as: IE:P-6 interactive whiteboard and Apple TV, EQ:P-6b had an interactive whiteboard, whilst CE:P-6 had a projector, screen with speakers and EQ:P-6a connected a laptop to a TV. School laptops were supplied to three P-6 participants but not CE:P-6 and none of the participants were supplied with an iPad for school purposes and had to be purchased by the teachers themselves. Software used by IE:P-6 included: Coding Jam\(^5\), Makey Makey\(^6\), Plickers\(^7\), Showbie\(^8\), Percussive Free\(^9\), Book Creator\(^10\), MadPad\(^11\), TuneTrain\(^12\) and AirDrop\(^13\). Due to a lack of devices, CE:P-6 identified that no software was used in the classroom and relied on CD’s. EQ:P-6a used CD’s, an aural program and nano for performances.

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5 Coding Jam - Compose their own by arranging Coding Blocks into patterns and sequences.

6 Makey Makey - Apple App Invention Kit: an electronic invention tool and toy that allows users to connect everyday objects to computer programs. Using a circuit board, alligator clips, and a USB cable, the toy uses closed loop electrical signals to send the computer either a keyboard stroke or mouse click signal to make instruments for composition activities.

7 Plickers - Apple App used for formative assessment. Plickers lets you poll your class for free, without the need for student devices. Just give each student a card (a “paper clicker”), and use your iPhone/iPad to scan them to do instant checks-for-understanding, exit tickets, and impromptu polls.

8 Showbie - Apple App. Creates a paperless classroom for creating, completing assignments, providing feedback, providing assessments and storing grades easy.

9 Percussive Free - FREE Percussive sounds - royalty-free! Find the Percussive sound you are looking for in seconds.

10 Book Creator - a tool for creating digital books, teaching resources or have your students take the reins. Combine text, images, audio and video to create: Interactive stories, Digital portfolios, Research journals, Poetry books, Science reports, Instruction manuals, ‘About me’ books, Comic adventures.

11 MadPad - Apple App that encourages users to get creative with everyday sounds. An audio mixing app that lets users record sound and video clips and then remix them into percussive and melodic beats, loops, sound compositions, sound scapes.

12 TuneTrain - an iPad music creation app, where kids can quickly create and edit melodies through a fun line-drawing mechanic.

13 AirDrop - iPhone, iPad, or iPod touch, instantly share your photos, videos, documents, and more with other Apple devices that are nearby.
whilst EQ:P-6b used software such as: AB Tutor\textsuperscript{14}, MuseScore\textsuperscript{15}, Garage Band\textsuperscript{16} and Quaver Music\textsuperscript{17}.

Field texts collected from 7-10 classroom music teachers identified that all participants were supplied with school laptops, internet access and BYOD schemes. All schools expected students to bring their own laptops to music lessons. Independent Education: Year 7 to Year 10 (IE:7-10) and Education Queensland: Year 7 to Year 10 (EQ:7-10) allowed students to own a combination of Apple and Windows devices in Years 7-10. However this required both schools to permanently provide an average of 15 Apple computers within music classrooms for students with Windows devices to complete work during the music lesson. CE:7-10 did not provide any spare computers because all students carried Mac laptops. IE:7-10 and CE:7-10 had a screen that connected to the teacher’s laptop but the screen was not interactive, whilst EQ:7-10 had an interactive whiteboard but had never used it. CE:7-10 and EQ:7-10 favoured connectable equipment such as audio boxes, bass amps, guitar amps, electric drum kits, microphones and keyboards. CE:7-10 provided a ratio of 1:2 keyboards and interface kits in the music classroom whilst EQ:7-10 had a keyboard lab in each music room. Both IE:7-10 and EQ:7-10 had recording studios which 7-10 students were not permitted to use. Field texts identified the software common to all participants included NoteFlight\textsuperscript{18} which is a free online notation software and GarageBand which is unique to Apple. Whilst CE:7-10 depended on these two software

\textsuperscript{14} AB Tutor - classroom management software tool enabling networked classrooms using PC remote desktop access to control, manage, safeguard, demonstrate, support and collaborate with your students.
\textsuperscript{15} MuseScore - Professional music notation software, input via MIDI keyboard.
\textsuperscript{16} Garage Band - Apple App turns an iPad and iPhone into a collection of touch Instruments and a full-featured recording studio to create loops, multi-track pieces, sound scapes.
\textsuperscript{17} Quaver World - PreK-8 music education in America. Quaver Music’s student website, Quaver’s World, is an interactive music. A phone box that travels through history, talking composers and more.
\textsuperscript{18} Noteflight - Free online notation software used for composition. Noteflight is an online music writing application that lets you create, view, print and hear professional quality music notation right in your web browser.
packages along with MuseScore, IE:7-10 also assigned the use of Sibelius\textsuperscript{19}, Auralia\textsuperscript{20}, Musician and Online Games\textsuperscript{21} to specific year levels and EQ:7-10 used Finale and Sibelius.

5.2.2 ICT support

To explore the availability of ICT support, participants were asked to indicate who provided ICT support at their school. The aim of this question was to understand the support system available to classroom music teachers which may enhance participants’ abilities to implement ICT in the music classroom, so participants may effectively teach the Australian Curriculum, as prescribed by sub-research question six. Participant responses identified sources of ICT support that P-6 classroom music teachers rely on to implement ICT as: ICT staff, librarian, other staff and family members. Organisational practices P-6 classroom music teachers require ICT support for included: the possibility of receiving a teacher laptop, procedures for ICT requests, the possibility of receiving ICT support during music classes, music budget, software updates and internet. Participant responses identified sources of ICT support 7-10 classroom music teachers rely on to implement ICT as: full-time ICT staff. Organisational practices 7-10 classroom music teachers require ICT support for included: procedures for ICT requests, the possibility of receiving ICT support during music classes, ICT support for students and music budget.

Field texts from semi-structured interviews with P-6 classroom music teachers identified that various levels of ICT support are offered at their school. IE:P-6 has two full-time ICT staff members, one specialising in PC to support all teachers who use PC and the second specializing in iPads to support the students who are all on Apple iPads. CE:P-6 identified that one ICT staff member comes one day a week, otherwise the Deputy Principal is very helpful. The EQ:P-6a participant identified that an external ICT staff member comes to the school once a week but she receives ICT help from her husband. EQ:P-6b identified an ICT support person who works

\textsuperscript{19} Sibelius - Music Notation software used by composers, arrangers, publishers and educators. Create scores with unlimited parts and custom layouts.

\textsuperscript{20} Auralia First & Musition First are cloud solutions used to develop musicianship with ear training software including pitch, intervals, chords, scales, tuning and rhythm, cadences, rhythm dictation, harmony, jazz progressions and melodic transcription. Complete assessment tasks at school or home with class record keeping.

\textsuperscript{21} Musician and Online Games - Various Music Games.
three days a fortnight comes to the school to look after the staff computers and the computer lab, but he does not support iPads. The librarian is in charge of software on iPads and charging iPads prior to borrowing. All participants described the process involved in lodging an ICT request form and the time delay involved before the request is processed. Participants were also united in explaining that ICT staff do not come to the classroom when problems arise. IE:P-6 explained that the “IT guys manage hardware via net-nanny and can diagnose across the phone” (IE:P-6) whilst all other participants supported the notion that “everything just goes to chaos” (EQ:P-6b). Both IE:P-6 and EQ:P-6b have a music budget to purchase equipment, software and software licenses, whilst CE:P-6 and EQ:P-6a do not have a music budget.

Field texts collected from 7-10 classroom music teachers identified that all schools employed full-time ICT staff to support both teachers and students, with the addition of CE:7-10 employing subcontractors to maintain laptops and infrastructure. The IE:7-10 participant noted that if there was an ICT issue during a class she could email the ICT staff and they may come to assist straight away, whilst CE:7-10 and EQ:7-10 were adamant that ICT staff would not come to assist and they needed to fix it on their own or encourage the students to help each other. All participants described the process involved in lodging an ICT request form, IE:7-10 felt confident of a swift response, CE:7-10 understood he must wait for the request to be fixed and EQ:7-10 had issues with ICT devices not working and requests unresolved. Whilst the participant for IE:7-10 was unsure of the music budget, the CE:7-10 participant felt confident that any budget submission would be approved just as last years submission totalling $15,000 for music resources was approved because the school supported ICT in the Arts wanting it to be “practical and engaging” (CE:7-10), whilst the EQ:7-10 participant had a process of completing a request for resources, resulting in waiting periods of twelve months or years to get permission to purchase resources, despite the collection of student music levies designed for “maintaining and replenishing laptops” (EQ:7-10). A summary of music budget allocations are noted in Table 8.
<table>
<thead>
<tr>
<th>School</th>
<th>Budget</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE:P-6</td>
<td>Yes budget</td>
<td>BYOD 1:1 device school. Budget to pay for software and updates conducted by ICT support staff</td>
</tr>
<tr>
<td>CE:P-6</td>
<td>no budget</td>
<td>Requested resources (iPads) had been denied monetary support by the school Principal</td>
</tr>
<tr>
<td>EQ:P-6a</td>
<td>no budget</td>
<td>Requested resources (iPads) had been denied monetary support by the school Principal</td>
</tr>
<tr>
<td>EQ:P-6b</td>
<td>minimal budget</td>
<td>Permission to buy resources was dependent on Principal and P&amp;F monetary support</td>
</tr>
<tr>
<td>IE:7-10</td>
<td>Yes budget</td>
<td>Has all the resources needed</td>
</tr>
<tr>
<td>CE:7-10</td>
<td>Yes budget</td>
<td>Had recently submitted a request for $15000 of ICT music resources: “I’ve never been knocked back on anything that I’ve wanted”.</td>
</tr>
<tr>
<td>EQ:7-10</td>
<td>Music Levy in school fees</td>
<td>Requests take years to get resources despite students paying an annual student music levy used for maintaining laptops and replenishing laptops.</td>
</tr>
</tbody>
</table>

Table 8. Music budget allocations.

5.2.3 School practices that hinder the implementation of ICT

To investigate participants’ perceptions regarding factors that hinder the implementation of ICT in music, participants were asked to indicate what negatively impacts their intention to incorporate ICT in their music program. The aim of this question was to understand the practical aspects influencing ICT implementation in schools, so that organisational practices may be revised to increase ICT implementation so that teachers may teach the Australian Curriculum, as prescribed by sub-research question six. Participant responses identified the main issues significant to P-6 are the lack of ICT resources, the desire and lack of iPads, time for lesson preparation and class time, software updates rendering applications inoperable and a waste of money, reliance on ICT staff to install, update and maintain software, borrowing iPads from the library raises issues with saved files, student engagement and the unreliability of
internet. Participant responses significant to 7-10 classroom music teachers are the quantity of available resources and unreliable resources, time, being misunderstood, software and student engagement.

Field texts collected from P-6 classroom music teachers showed that organisational practices determined the availability of ICT devices in music lessons. IE:P-6 indicated that the school’s one-to-one iPad policy enabled and supported the implementation of ICT, by ensuring that every child possessed an ICT device for individual hands-on practise. Other participants indicated that they did not have access to iPads for various reasons which stopped them from implementing ICT. CE:P-6 was allowed to borrow six spare iPads from classrooms but found that six iPads for a class of 30 students, resulted in groups of 5 students per touch screen. This meant that the students did not receive quality hands-on experiences, students were impatient to receive their turn on the iPad, interaction times were very short in duration and the development of ICT skills was overshadowed by behavioural management whilst students waited for their turn, thus deeming the use of six iPads as unsuccessful. EQ:P-6a found that computers in the computer lab did not work and students were frequently unable to log on. EQ:P-6b found that the computer lab took forever to load and the internet was unreliable, furthermore the participant held a preference for iPads based on students’ abilities to operate iPads better than computers but a lack of iPads inhibited the participants ability to implement ICT successfully.

P-6 classroom music teachers identified that a lack of time to prepare and practise ICT skills in preparation for music lessons, was a common inhibiting factor. Reasons for this lack of time were attributed to the schools expectations that classroom music teachers perform playground duties, choir and instrumental ensemble rehearsals. Teacher involvement in these extra activities effectively reduced available time for lesson preparation. CE:P-6 noted that a further inhibiting factor included the reduction of music lesson time allotted to each class per week. Classroom music had been reduced from 60 minutes per week to 30 minutes per week which
had halved the lesson time available to cover the curriculum, which not only included the implementation of ICT and operation of ICT devices but all aspects of the music subject.

IE:P-6 indicated that an IOS update had rendered a number of software applications inoperable after having spent up to $1000 on each application. CE:P-6 and EQ:P-6b indicated that a reliance on ICT staff to install software was a contributing factor that inhibited the use of ICT in music. Those classroom music teachers who relied on borrowing iPads from the library, found that when the school library allowed students to use iPads at lunch, EQ:P-6 found that music students were unable to find their saved work, or they were unable to locate the same iPad that they saved their work on, or lunch-time students had wiped previously saved files. These students were then required to duplicate their deleted work, which wasted a subsequent music lesson putting them behind the rest of the class, whilst the risk of having repeated files deleted was still a real possibility. This restricted lesson planning involving ICT skill development to activities which could be completed and assessed in a single lesson and excluded any activities which built on previous work or developed complicated ICT proficiencies. In contrast, IE:P-6 found that students under the one-to-one iPad scheme eliminated the problem of having their files deleted and were able to implement lessons involving terraced activities which were designed to enhance previous ICT activities and develop intricate ICT skills.

P-6 participants found that certain circumstances interrupted student engagement with ICT and encouraged misbehaviour: EQ:P-6a found that students were saturated with ICT usage in the classroom and preferred to use real instruments in music because they “don’t really want to work with computers anymore” (EQ:P-6a); EQ:P-6b identified that when students cannot log in they are distracted easily and off-task and IE:P-6 had to create class-routines to limit ICT time to “stop wandering fingers” (IE:P-6). Two participants indicated that the issue of internet reliability represented a significant inhibiting factor when implementing ICT, for instance: IE:P-6 experienced significant reliability issues with the internet, but due to her schools paperless policy they were motivated to find a successful outcome with NBN and WIFI which benefitted the whole school; and EQ:P-6b found that the unreliable internet inhibited learning in lessons
which relied on websites, the slow internet necessitated that the learning tasks were dumbed-down to allow for slow internet and short lesson times.

All of the 7-10 classroom music teachers identified that the most inhibiting factors when trying to implement ICT in music included: the number of ICT resources available during music lessons and the reliability of those ICT resources provided. The unreliability of ICT resources was exemplified by: IE:7-10 indicated that the unreliability of the sound system coupled with the unavailability of ICT support posed the greatest problem; CE:7-10 identified that the lack of resources in particular “the number of resources definitely contributed” (CE:7-10) to inhibiting ICT, as well as the Apple TV’s tendency to drop out without warning interrupted lessons; whilst EQ:7-10 recalled that it was “frustrating when I didn’t have computers, then when I did have computers they didn’t work... where as these days, it’s fantastic... I’ve got the equipment that I want... it seems pretty seamless most of the time apart from the user errors or the Wi-Fi not kicking in” (EQ:7-10).

The issue of time was considered an inhibiting factor by IE:7-10 who felt “pushed timewise to deliver the program, to get through developing the musicianship, to develop the composing skills...composing, musicology and performing” (IE:7-10), especially with continual interruptions and withdrawals to music lesson times. CE:7-10 indicated that time to manage music gear and resources constricted the implementation of ICT. Participants felt their role as the classroom music teacher was misunderstood by school leadership and ICT staff. This was demonstrated by: IE:7-10 who had been supplied with a Windows laptop when the entire music department used Mac. This meant that the teachers’ laptops did not have Apple software such as Garage Band, which dominated the music program. CE:7-10 mentioned his concerns that the school was changing from the current seamless system with Mac to an uncertain system with Windows in the following year. IE:7-10 found that her software account had been set up incorrectly; whilst EQ:7-10 found software to be problematic when students have different laptops. EQ:7-10 also found a lot of problems stemmed from “kids who try to put programs on their computers, something goes wrong and the computer dies” (EQ:7-10). Secondary (7-10)
music teachers considered the implementation of ICT to be a positive influence on student engagement: CE:7-10 found the issue of student engagement to be insignificant now with the integration of ICT since students were experiencing a greater level of engagement, and EQ:7-10 relied on “routines for classes, seating plan, tech savvy kids helping [resulted in] students [being] quite engaged” (EQ:7-10).

5.2.4 School practices that assist the implementation of ICT
Participants’ perceptions regarding factors that help with incorporating ICT in music were investigated by asking participants to indicate what school practices positively impact their intention to incorporate ICT in their music program. The aim of this question was to understand the school practices which positively influence ICT implementation in music, so that teachers may effectively teach the Australian Curriculum, as prescribed by sub-research question six. Responses from both P-6 and 7-10 participants consistently indicated that the BYOD scheme positively influenced teachers’ abilities to implement ICT in music.

Both EQ:P-6a and EQ:P-6b participants indicated that their school was not a BYOD school and CE:P-6 was a 1:1 device school but the BYOD devices were not allowed to enter the music room. These three participants were unable to suggest any positive influence that helped them implement ICT in music. Field texts from IE:P-6 and all 7-10 classroom music teachers identified the BYOD scheme as the only positive influence on the implementation of ICT in the music program. Table 9 outlines the BYOD scheme policies of the participants’ schools.

<table>
<thead>
<tr>
<th>Purchase from school with a payback repayment schedule</th>
<th>Rent device through school</th>
<th>School owns devices</th>
<th>Students purchase from independent retailer</th>
<th>No access</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE:7-10</td>
<td>nil</td>
<td>nil</td>
<td>IE:7-10</td>
<td>EQ:P-6a EQ:P-6b</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EQ:7-10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IE:P-6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CE:P-6</td>
<td></td>
</tr>
</tbody>
</table>

Table 9. BYOD scheme usage providing laptops and iPads for students at participants’ schools.
5.2.5 *Defining the term ICT in the context of music*

To investigate participants’ understanding of the term ICT, participants were asked to define the term ICT. This question aimed to identify what resources participants considered to be ICT and the inference this definition had on the fulfilment of the Australian Curriculum, as prescribed by sub-research question one. All P-6 and 7-10 participants were uncertain about how to define the term ICT and all used the terms technology and ICT concurrently even though some participants acknowledged the role of ICT was to extend learning. Contrary to the senior years definition, both IE:7-10 and EQ:7-10 considered musical instruments and performance gear as separate from computer equipment. A cumulative list of examples of ICT indicated by all P-6 and 7-10 participants included keyboard, CD’s, computers, internet, iPad, screen, software, hardware, downloads, websites, laptop, overhead projector, music technology like a digital platform for storing, interface that records, data projectors, digital mixing desk and hooking up music equipment to the computer.

Field texts collected from P-6 classroom music teachers indicated that participants were uncertain of how to define the term ICT. IE:P-6 and EQ:P-6b stated that ICT extends learning, as CE:P-6 and EQ:P-6a indicated, ICT was anything that connected to a laptop or internet. The terms ICT and technology were used concurrently by participants and although IE:P-6 offered to separate the terms she remained uncertain, “we teach technology but the tool is ICT, I don’t know if it’s right” (IE:P-6) but CE:P-6 defined ICT as “ICT is different to technology because technology can be something that’s new for its time like a pencil. ICT can be technology as well but ICT you can program and it can control other devices” (CE:P-6). A cumulative list of examples of ICT indicated by P-6 participants included keyboard, CD’s, computers, internet, iPad, screen, software, hardware, downloads and websites.

Field texts collected from 7-10 classroom music teachers indicated there was uncertainty about the definition of ICT. CE:7-10 and EQ:7-10 referred to the extension of learning. Again, the term technology and ICT were used concurrently with the greatest clarity being offered by CE:7-10 “at Uni, talked about technology more than ICT...ICT was web to tools or interactive online
platforms and websites” (CE:7-10). Both IE:7-10 and EQ:7-10 considered musical instruments and performance gear as separate from computer equipment. A cumulative list of examples of ICT indicated by 7-10 participants included laptop, overhead projector, music technology like a digital platform for storing, interface that records, computers and software programs, data projectors, digital mixing desk and hooking up music equipment to the computer.

5.2.6 Wish list and requests for ICT music resources

To investigate if participants had the resources they needed to deliver the learning experiences they would like, participants were asked about the resources they had requested. The aim of this question was to investigate participants’ requests for resources, so they may provide students with the learning experiences they envisaged necessary to fulfil the Australian Curriculum, as prescribed by sub-research question two. Field texts collected from CE:P-6, EQ:P-6a and EQ:P-6b identified the participants had requested iPads to fulfil their wish-list of resources but had been denied monetary support from their school Principals. IE:P-6 already had iPads in the one-to-one device school and considered herself “pretty lucky, this school is ahead of its time, so I really can’t argue” (IE:P-6). Her only concern was being able to maintain the high standard of ICT implementation in education. Field texts collected from all 7-10 participants identified that IE:7-10 did not request any more resources, but instead asked that the reliability of the current ICT resources, be improved. CE:7-10 felt confident that a submitted request would be approved whilst the EQ:7-10 participant identified that requests took years to get resources despite students paying an annual student music levy.

The main issue identified in field texts collected from three P-6 classroom music teachers (CE:P-6, EQ:P-6a and EQ:P-6b) focused on having no budget and Principals refusing to fund participant requests for resources, in particular, iPads. IE:P-6 currently teaches in a school with one-to-one devices where students bring their iPad to each music class and could not suggest any request, she just wished that her school could “continue to stay current with current trends” (IE:P-6). Within the 7-10 educational sector the IE:7-10 participant did not wish for resources but instead that ICT resources were reliable. At the time of this interview the CE:7-10
had recently submitted a request for $15000 of ICT music resources such as interfaces, microphones and leads and felt confident because “I’ve never been knocked back on anything that I’ve wanted” (CE:7-10). Despite a student music levy used for maintaining laptops and replenish laptops EQ:7-10 indicated that it takes years to get laptops. She also wished the recording studio would be upgraded.

5.2.7 Examples of incorporating ICT in the music program

To develop an understanding of how participants currently use available ICT resources in their music classrooms, participants were asked to give examples of activities incorporating ICT they had included in their music programs. This question intended to investigate the diversity of activities teachers used given the resources currently available, to compare the quality of activities based on the resources available in the music classroom and the hands-on nature of the activities offered to students in light of the requirements of the Australian Curriculum. Participant responses identified that P-6 classroom music teachers were restricted by the resources available to them. IE:P-6 was able to provide a diverse range of ICT activities due to resource availability. Students were able to experience a variety of hands-on opportunities such as: composition using Makey Makey, formative assessment using Plickers.com, App Smash 22, Aural Skill book, students used Book Creator then uploaded it onto Showbie, students recorded themselves and uploaded it using digital feedforward, students were able to improve their marks, students could create books in BookCreator, compose with Incredibox 23, create soundscapes with Garage Band, sound compositions and soundscapes using MadPad. CE:P-6 and EQ:P-6a were restricted to whole class activities using a projector, screen and personal laptop and TV respectively. EQ:P-6b provided the opportunity for students to compose a name rap.

Participant responses identified that 7-10 classroom music teachers were able to provide a number of hands-on opportunities for music students using ICT resources. After whole class

22 App Smash - is the process of using multiple apps to create projects or complete tasks. App Smashing can provide your students with creative and inspired ways to showcase their learning and allow you to assess their understanding and skills.

23 Incredibox - a music app that lets you compose your own music with a crew of beatboxers. Choose your musical style from 6 impressive atmospheres and start to lay down, record and share your mix.
instructions, IE:7-10 allowed students to complete ICT activities during music lessons including composition using NoteFlight or Sibelius. CE:7-10 students input a piece of music, compose using NoteFlight, play keyboard or bass guitar using a click track, export into Garage Band and drum part on midi keyboard and create loops and multi-track their pieces with class peers. EQ:7-10 explained that all lesson content, directions and activities are on OneNote and distributed electronically to students via Class NoteBook. Students also work on Online AMEB Theory and composition using headphones.

Field texts collected from P-6 classroom music teachers identified that all participants teach music in classrooms using ICT resources available to them. Within the IE:P-6 music program “everything is done on their iPads and uploaded to Google Classroom” (IE:P-6), the teacher modelled on her iPad screen which then mirrors on the Apple TV. Other activities involved Apps and software to support composition, formative assessment, aural skills, recording themselves, composition, sound compositions and sound scapes. CE:P-6 only had a projector, screen and personal laptop to model things for the whole class but felt confident that these resources were reliable but acknowledged the lack of hands-on for students. Due to the lack of ICT, children used instruments, paper and pencils. EQ:P-6a used the TV for class to view Curriculum to Classroom (C2C) resources such as a thirty second animation, students composed backing music on keyboards with headphones. EQ:P-6b composed a name rap on the computer and the teacher can then project her computer screen onto individual student’s computers for whole class instruction.

Field texts collected from 7-10 classroom music teachers identified that all participants gave instructions to the whole class then expected students to work on their own laptops with

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24 Click track - a term normally used in the recording studio or live performance environment, referring to the metronome that keeps the drummer and band in time. It’s normally run through a computer or app, and is set at a predetermined tempo.
25 OneNote - Microsoft OneNote, a digital notepad and note-taking app for ideas.
26 Class Notebook - Online Class Notebooks for Windows 10 and Mac enable electronic page and section distribution to Coding Jam a class, the ability to quickly review student work, and assignment and marking integration with many LMS/SIS partners. Students have a personal workspace for every student, a content library for handouts and a collaboration space for lessons and creative activities.
headphones to complete an activity during music lessons. IE:7-10 identified that students would work on composition using NoteFlight or Sibelius. CE:7-10 explained that each lesson involved students learning three skills, they are given a piece they have to input, use skills in melody and chord writing using NoteFlight, polish and record the performance on keyboard or bass guitar using a click track, export into Garage Band, and drum part on midi keyboard and create loops and multi-track their piece with class mates. EQ:7-10 explained that all lesson content, directions and activities were outlined on OneNote and distributed electronically to students via Class NoteBook. The participant stated “I’ve got an e-learning website full of music resources that I use like an electronic text book” (EQ:7-10). Students also worked on Online AMEB Theory and composition using headphones. The use of ICT in participants’ music programs is recorded in Table 10.
<table>
<thead>
<tr>
<th>Participant</th>
<th>ICT</th>
<th>ICT activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE:P-6</td>
<td>BYOD 1:1</td>
<td>Composition using Makey Makey, formative assessment using Plickers.com, App Smash, Aural Skill book, Book Creator then upload it onto Showbie, students recorded themselves and uploaded work, then using digital feedforward students could improve marks, create the books in BookCreator, composing with Incredibox, sound scapes with Garage Band, sound compositions and sound scapes using MadPad.</td>
</tr>
<tr>
<td>CE:P-6</td>
<td>No ICT</td>
<td>Whole class activities. Uses a projector, screen and laptop and internet</td>
</tr>
<tr>
<td>EQ:P-6a</td>
<td>No ICT</td>
<td>Whole class activities. Has no internet. No ICT</td>
</tr>
<tr>
<td>EQ:P-6b</td>
<td>Computer lab</td>
<td>Compose a name rap Saving files on shared iPads – a nightmare!</td>
</tr>
<tr>
<td>IE:7-10</td>
<td></td>
<td>Composition using NoteFlight or Sibelius</td>
</tr>
<tr>
<td>CE:7-10</td>
<td>BYOD 1:1</td>
<td>Input a piece of music, compose using NoteFlight, play keyboard or bass guitar using a click track, export into Garage Band and drum part on midi keyboard and create loops and multi-track their piece with class mates</td>
</tr>
<tr>
<td>EQ:7-10</td>
<td></td>
<td>All lesson content, directions and activities are on OneNote and distributed electronically to students via Class NoteBook. Students also work on Online AMEB Theory and composition using headphones.</td>
</tr>
</tbody>
</table>

Table 10. Utilisation of ICT in music programs.

5.2.8 Teacher confidence regarding ICT

The confidence of classroom music teachers regarding the use of ICT in music programs is a significant factor influencing the implementation of ICT in music. Participants were asked about their level of ICT proficiency, how confident they felt about using ICT in their music classroom and how they had developed that level of confidence. The objective of this question was to determine the confidence felt by individual participants and the circumstances that had contributed to that level of confidence, as prescribed by sub-research question four. Participant
responses from both the primary and secondary educational sectors identified that all participants had relied on self-initiated self-education, which had occurred during participants’ personal time. All participants had achieved their level of proficiency through ‘trial and error’ and by relying on online sources such as Forums, YouTube and Google.

Field texts collected from participants working within the primary educational sector identified that all participants had acquired their level of ICT confidence and proficiency from self-initiated self-education. IE:P-6 indicated a confidence level greater than other participants through the statement “I’m pretty switched on myself. I’m actually a technology mentor for MusicEdNet” (IE:P-6). This participant attributed her proficiency to iPad videos by Neil Johnston, acquired via Distance Ed, recalling she would “learn it on Sunday and teach it on Monday. I bought myself an iPad with salary sacrifice and taught myself” (IE:P-6). CE:P-6 did not feel very confident, however this participant would practise ICT skills prior to lessons then demonstrate to students, but at the same time was happy to step back and let students step into the teacher role if problems arose. EQ:P-6a felt intimidated by the fast pace of technological change and the fear created from seeing teachers become unemployed due to not coping with ICT. To overcome this issue, the participant would not “bring it in until I’ve had a really good go at it…not the place to experiment with our students. Behaviour management is a really big issue” (EQ:P-6a). EQ:P-6b felt confident but “not when it doesn’t work” (EQ:P-6b). This participant felt her level of proficiency was due to self-education and ‘trial and error’, as well as utilizing online resources such as Midnight Music27 Katie Wardrobe and YouTube.

Field texts collected from participants working within the secondary education sector identified that all participants had acquired their level of ICT confidence and proficiency from self-initiated self-education. IE:7-10 indicated she felt confident with things that are “used a lot…but not if anything goes wrong” (IE:7-10). This participant attributed her proficiency to online training, videos and collegial training which had been initiated by self-orientation and done in her own time. CE:7-10 demonstrated the highest degree of confidence in the secondary sector which he

27 Midnight Music - Online professional development tutorials for iPads in music education, helping music teachers how to use technology to foster creativity, increase productivity and enhance learning outcomes.
attributed to his experience and self-directed interest in live sound. Despite learning very little in his university course, this participant has learnt via ‘trial and error’, YouTube and Forums and considers he is “still learning a lot” (CE:7-10). EQ:7-10 felt confident “to an extent. There’s a lot I don’t know ... about recording and Garage Band” (EQ:7-10). This participant considered her proficiency the result of ‘trial and error’, YouTube tutorials and Google.

5.2.9 Professional Development

This research aimed to investigate teachers’ perceptions about professional development they felt would be beneficial in implementing ICT in music. The purpose of this question was to determine how professional development may target the needs of classroom music teachers, to assist them with the task of incorporating ICT in their music programs and teach the curriculum, as prescribed by sub-research question five. Participant responses identified that the majority of participants in both the primary and secondary educational sectors favoured self-paced professional development sourced from online sources such as Blogs, Facebook, Forums and Websites. Participants indicated a preference for professional development that demonstrated skills and allowed them to practise and experiment with ICT devices in their possession at their individual pace.

Field texts collected from P-6 classroom music teachers identified that participants favoured self-paced professional development sourced from online sources. CE:P-6 and EQ:P-6a were the only primary participants who had attended professional development hosted by Crescendo Music Education, which is a prominent professional development provider for classroom music teachers in Queensland. CE:P-6 was skeptical about the value of professional development without having ICT resources to practise skills and facilitate hands-on opportunities for students. Both IE:P-6 and EQ:P-6b had not attended professional development but preferred blogs, Facebook and Midnight Music. Both participants stated a preference for professional

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28 Blog - an online diary or journal located on a website. The content includes text, pictures, videos, animated GIFs and scans from old physical offline diaries or journals and other hard copy documents. It can exist merely for personal use, sharing information with an exclusive group or to engage the public, a blog owner can set their blog for private or public access.
development that “shows them what it is and let them play with it, that provides hands on activities that teachers can adapt into their classroom” (IE:P-6).

Field texts collected from 7-10 classroom music teachers identified that all participants were undivided in their preference for online professional development via online forums and websites with EQ:7-10 believing “there’s not a lot that I can go to that would specifically train the stuff I need” (EQ:7-10). Although IE:7-10 and CE:7-10 have not planned to attend any professional development in the future they both felt that their school would be happy to fund any professional development they requested.

5.2.10 Australian Curriculum
To investigate teachers’ perceptions about the expectations of the Australian Curriculum and their role as a classroom music teacher, participants were asked what they thought the Australian Curriculum asks teachers to do and are those expectations reasonable? The aim of this question was to determine participants’ knowledge of the Australian Curriculum given the obligatory nature of the curriculum, as well as participants’ perceptions regarding the reality of expectations placed on teachers by the Australian Curriculum, given the provision of ICT resources within individual music classrooms, as prescribed by sub-research question six. Participant responses identified a number of issues participants were concerned about. Due to a lecturing position, IE:P-6 was confident that the integration of ICT in the Arts was designed to develop digital literacy through exposure to ICT devices. CE:P-6 felt frustrated at the lack of resources and support from the school community. EQ:P-6a focused on using the C2C to ensure the use of three elements: compose, respond and perform in the music program, whilst being concerned that her role of music teacher was to be extended to Arts teacher in the following year, she felt inadequately prepared or skilled for such specialised areas, knowing the specialisation of a music teacher and having to suddenly teach three other specialist arts areas without specialized skills. This participant felt pressured into taking long service leave to plan for the Arts Curriculum she had to teach. EQ:P-6b had not looked at the Australian Curriculum for ICT but had focused on composition and performance. All participant responses from the
secondary education sector revealed a more relaxed response that considered the Australian Curriculum should fit into their own program and the resources they have available. This meant that ICT was an extension of the learning already taking place and contributed to the feeling of ICT being embedded.

Field texts collected from P-6 classroom music teachers uncovered a number of issues regarding the Australian Curriculum. The aim of this question was to determine if classroom music teachers understood the requirements of the new curriculum and their role to facilitate ICT in music. As a guest lecturer IE:P-6 had instructed undergraduate teachers in the field of integrating ICT in the arts. Her understanding of the curriculum meant “having children digitally literate, kids exposed to ICT with an interactive whiteboard, composing, recording sounds, making sound scapes” (IE:P-6) and for this reason, as a Kodaly music society (KMEIA QLD) member, found “Kodaly teachers very reluctant to use ICT, I think [they are] not doing the Australian Curriculum” (IE:P-6). CE:P-6 felt the curriculum required music teachers to provide hands-on opportunities with ICT but was challenged by a lack of ICT resources and felt the Australian Curriculum is “great on paper but the practical side of it is that I’m dealing with people who don’t want to help” (CE:P-6). EQ:P-6a felt the new curriculum focused on the three curriculum elements of compose, respond, perform and to achieve this she focused heavily on the need to explore the C2C documents. This participant had recently been informed her role of music teacher was to be changed to Arts teacher in the following year, to which the participant commented “we are no longer music teachers, we’re Arts teachers. I’m going to be asked to teach in four areas that I have no competency in and no training” (EQ:P-6a). EQ:P-6b admitted “I haven’t looked very much at the Australian Curriculum in ICT or in music” (EQ:P-6b) but had focused on composition and performance in her music program and had not focused on ICT.

P-6 classroom music teachers felt that secondary teachers were more relaxed about the curriculum requirements and inclined to focus primarily fitting the Australian Curriculum into the resources they already had in the classroom. IE:7-10 identified a lack of knowledge regarding what the Australian Curriculum was asking and resigned to “provide a program that’s
widely accessible, variety of experiences including...electronic music, interact physically...with software programs that enhance hearing, learning and composition” (IE:7-10). The CE:7-10 participant admitted “I basically do my own thing. I interpret the skills that they want them to learn and then determine how I can do that in a more traditional sense and then how I can use ICT to make it more real” (CE:7-10), to engage students in hands-on activities. EQ:7-10 saw the inclusion of ICT in the Australian Curriculum as an extension of learning material already being covered within the music program. In that way, the participant felt ICT was embedded in the music program and she could use ICT resources already available in the music classroom to extend the current music program.

5.2.11 Ideas verses reality

- In this section, the investigation aimed to gather data to compare if teachers felt they could teach their ideal music program within their current teaching environment. The aim of the question: Is there a difference between your ideas and reality? Why? was to discover if participants felt there was a difference between their own teaching ideas of how they would like to include ICT in the music classroom and reality. Participant responses from the primary sector were divided with IE:P-6 professionally satisfied that her ideal was her reality, however all other participants requested basic ICT resources, in particular iPads. Participants in secondary education had idealistic aspirations but IE:7-10 felt unsupported in changing the reality, CE:7-10 was restrained by the direction of the curriculum and EQ:7-10 found consolation that after years of asking for resources she had acquired the resources she needed to teach the music program she wanted to teach.

Field texts collected from P-6 classroom music teachers highlighted the professional wishes of these participants so they may use ICT in the music classroom and teach the Australian Curriculum. Whilst IE:P-6 was professionally satisfied that her reality was her ideal, the other participants all asked for basic ICT resources, specifically iPads. CE:P-6 stated “The reality is very different to my ideas. [The Principal’s] attitude affects the [classroom] teachers so they keep
the iPads in the classroom...I’d love to do a lot of stuff with ICT in the [music] classroom but the reality is I have no resources, no time and no-one to help” (CE:P-6).

Field texts collected from 7-10 classroom music identified that IE:7-10 would like to do more innovative ideas but due to a lack of support has learnt “to just drop it” (IE:7-10). CE:7-10 would like to make 7-10 more project based but believed it would not align with the changing senior education. EQ:7-10 was professionally satisfied: “now I’m at a point where my reality is what I teach...I’ve got what [resources] I’ve got now, but that was hard to get” (EQ:7-10).

5.3 Summary of qualitative field texts
This chapter has presented the findings from seven semi-structured interviews which involved questions regarding: teacher background information, school information, ICT in music education and professional development. Valuable teacher perceptions regarding the implementation of ICT in music programs highlighted important issues that were identified within the field text findings: all participants teach music in classrooms with internet access although 1:1 access to iPads and laptops favoured secondary students (7-10) and the Independent Primary students (IE:P-6); all Classroom music teachers had to purchase their own iPads for school use; 1:1 access to an ICT device increased the occurrence of hands-on learning; participants from 7-10 schools felt a greater level of ICT support due to their willingness to be help during class-times, this also affected teacher confidence; shared devices in computer labs and from libraries was deemed to contribute to time wastage, whilst saving student work was a significant problem; teachers regarded the lack of resources, time and budget as major inhibitors to their music programs; all participants were unable to define the term ICT; all participants engaged in self-initiated self-education instead of traditional professional development to increase their confidence; the general consensus viewed the curriculum as secondary to current music programs such as those developed on Kodaly based programs or due to resource availability.
Chapter 6: Results – Thematic Analysis

6.1 Introduction

This chapter will present a discussion of the research findings collated from the quantitative survey and the qualitative interview field texts presented in Chapters Four and Five. Consideration of the research findings in relation to the main research question, which motivated this investigation: What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program? will be presented to construct a broad understanding of the main issues identified within the research. These findings will provide a foundation for further critical reflection and discussion regarding the flow-on effects and consequences of the main issues identified within the research and recommendations for further research.

This research identified that a number of significant issues have influenced the implementation of ICT within music education in Queensland. The main issues identified in the research focused on: the availability of adequate resources which satisfy the definition of ICT involving programmability according to research, reliability and familiarity of ICT, suitability of online professional development, ICT funding and ICT support available within schools.

6.2 What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program?

Through the lived experiences and perspectives of classroom music teachers throughout Queensland this research was designed to provide an insight into organisational practices that positively and negatively influence the implementation of ICT in music education. This research investigation endeavoured to answer the primary research question through the use of six sub-research questions. Quantitative survey data and qualitative semi-structured interview field texts were used to gather classroom music teachers’ perceptions, to provide professional insight into the issues that affect the ability of classroom music teachers to implement ICT in their music programs. A comprehensive review of all collected survey data and field texts, has
provided an answer to this primary research question that has guided this research investigation and provided an understanding of organisational practices which enable or inhibit the implementation of ICT in classroom music throughout Queensland.

Classroom music teachers perceived the major inhibiting factors associated with implementing ICT in their music program to be: the need for access to adequate ICT resources, ICT funding and ICT support.

6.2.1 Resources
According to this research investigation, the lack of ICT resources was identified by classroom music teachers, to be the most significant factor inhibiting the implementation of ICT in music education. This lack of ICT resources referred to both the lack of accessibility to ICT resources within music classrooms, school computer labs and libraries, and also the insufficient supply of adequate quantities of resources so that students may physically engage with a device individually.

When considering the ICT proficiencies and expectations outlined within the Australian Curriculum, coupled with the mandatory obligations of ICT implementation imposed on classroom music teachers, this significant under-resourcing of ICT within music classrooms questions the gravity of the mandatory implementation. Successful implementation of ICT in schools throughout Queensland according to the proficiencies prescribed in curriculum documents, suggests a necessity and extensive reliance on hands-on experiences which therefore requires access to appropriate resources and adequate quantities of ICT resources within music classrooms, to effectively utilise time allotted to specialist music lessons. The development of students ICT skills and proficiencies are prescribed within the Australian Curriculum, which defines students outcomes and ICT capabilities within the ICT subject as:

Students develop ICT capability as they learn to use ICT effectively and appropriately to access, create and communicate information and ideas, solve problems and work collaboratively in all learning areas at school...The capability
involves students in learning to make the most of the digital technologies...  
adapting to new ways of doing things as technologies evolve and limiting the  
risks to themselves and others in a digital environment. (ACARA, 2012, p. 16)

The likelihood of students being able to achieve these prescribed outcomes and ICT capabilities within the music subject is severely jeopardised, when this research has found the lack of accessibility to ICT resources as well as the insufficient supply of resources in quantities sufficient for class sizes. Provision of the necessary resources in quantities needed to accommodate individual skill development must be addressed, so that classroom music teachers are able to help students achieve the prescribed outcomes and ICT capabilities through the implementation of ICT.

The severity of this resource deficiency was emphasised by a review of the survey data, which was used to construct an itinerary of ICT resources collectively available within Queensland music classrooms. Music classrooms throughout Queensland were found to possess the following resources in the highest frequencies: untuned percussion, tuned percussion, whiteboard and internet access (Figure 7). With the exception of internet access, these resources are characteristic of Kodaly and Orff traditional methodologies prominently used within classroom music throughout Queensland and to date do not support the mandatory implementation of ICT in music education. Those ICT resources necessary for the implementation of ICT in music education were found to be supplied in the lowest frequencies which included iPads, laptops, recording studios and synthesizers, whilst a significant percentage of respondents indicated the school provided no resources and respondents had to provide their own resources. Through this data it became evident that only 13% of schools were being provided with iPads for the music classroom, this highlighted that 86% of music classrooms do not have iPads to complete hands-on music curriculum activities. 86% is a significant percentage of music classrooms trying to implement ICT without iPads. This data paints an alarming picture when considering the professional responsibility of school leadership to provide adequate resources to support their educational policies, however school leadership
have expected classroom music teachers to purchase their own ICT devices to deliver the
curriculum that teachers have been made accountable for. Another surprising practice noted
the majority of schools supplied their classroom music teachers with laptops only, so all of the
classroom music teachers had to supply their own iPads for school music lessons. This finding
was significant, when iPads in particular Garage Band, are such a prominent educational ICT
music classroom tool throughout all grades (P-10) relevant to this research. This research found
that some organisational practices encouraged BYOD to relieve the need to supply devices such
as iPads. This was supported by the data which found that although only 13% of schools
 supplied iPads to the music room, four out of seven participants IE:P-6, IE:7-10, CE:7-10 and
EQ:7-10 relied on students to bring their own devices to music. This was a significant issue
when a school is paperless, as stated by IE:P-6, or restrictions on photocopying are placed on
teachers.

A comparison between educational providers in determining if some educational providers
supply more ICT resources than others, found using a correlation which showed that the supply
of untuned percussion, tuned percussion, ukuleles, keyboards, electric drum kit, projector,
speakers, whiteboard and iPads was significantly greater in Independent Education schools.
Education Queensland supplied the lowest number of resources and Catholic Education
supplied an adequate number of resources to maintain their position between Independent
Education and Education Queensland in all correlations. This comparative information of the
three education providers showed the prioritisation of resources within the three different
types of schools. This was further supported by findings in this research, for instance the supply
of internet. One Education Queensland primary school (EQ:P-6a) had received the internet one
week prior to the interview in preparation for the participant’s new role of Arts Amalgamation
teacher. The provision of interactive whiteboards was also varied with the Independent primary
(IE:P-6) and Education Queensland (EQ:P-6b and EQ:7-10) providing interactive whiteboards.
The Independent and Catholic secondary schools (IE:7-10 and CE:7-10) were provided with non-
interactive whiteboards that instead connected to teacher laptops. Although the majority of
teachers were supplied with a school laptop, the Catholic primary school (CE:P-6) had to supply
her own laptop which corresponds with survey data that indicated 15% of teachers buy their own resources.

It is interesting to note the difference between the intention of the 2012 policy document entitled *The Shape of the Australian Curriculum v4* (ACARA, 2012b), and the degree of support and supply of resources to classroom music in Queensland. This research has identified concerns regarding the supply of ICT resources to music education to support the delivery of curriculum according to policy documents. In particular, the lack of accessible iPads in music classroom denies students the ability to hands-on ICT experiences and development of “ICT capability” (ACARA, 2012, p. 16), the inability of schools to provide reliable internet solutions and the need for teachers to supply their own ICT devices, including both laptops and iPads, demonstrates the priorities and a disregard of music education by school leadership. The findings of this research investigation, which was conducted in 2017, supported the findings of previous research conducted by the NRSME (Pascoe et al., 2005), which identified a lack of ICT resources for music education. This research also correlated with research conducted by Crawford (2009) which found insufficient resources were provided for classroom music education with preference given to other educational initiatives (p. 472).

These research findings clearly identified that classroom music teachers do not have access to adequate quantities of appropriate ICT resources necessary to teach the Australian Curriculum. Despite the expectation of the Australian Curriculum that requires students to develop ICT proficiencies, classroom music teachers are accountable for teaching ICT skills without access to ICT devices to practise ICT skills. For constructivist hands on learning activities to take place, it is logical to suggest that ICT devices need to be available for students to readily access within the music room. This highlights the need for each student to possess a device for individual work to be accomplished. It is obvious to say, that five students sharing the one touch screen device does not equate to effective learning experiences. For the purpose of enabling individual ICT skill development, the majority of classroom music teachers do not have accessibility to adequate quantities of appropriate resources in order to carry out their professional duties.
This research has inadvertently emphasised the professional responsibility of school administrators to provide classroom music teachers with necessary ICT resources, if teachers are expected to teach the Australian Curriculum effectively.

6.2.2 Internet

The supply of internet access was found to be disproportionately high compared to the limited availability of ICT devices within music education. The high percentage of internet access in music classrooms was attributed to the supply of internet to the general classrooms in the school, administration and teacher internet access. Internet connection was not specifically intended to supply the music classroom but occurred by default when schools connected the internet to the general classrooms.

A significant gap was identified between those classroom music teachers who had internet access compared to those who had ICT resources to utilise the internet during music, in particular, 73% of schools were provided with internet access in the music classroom and only 13% of music classrooms had iPads to complete hands-on ICT activities to fulfil the Australian Curriculum in music. This discrepancy demonstrated the priorities of school leadership to connect the internet for general school purposes, whilst the acquisition of internet for music education was received by default. This evidence was further supported by the limited provision of devices for the music classroom as they were not an important consideration.

Deliberate segregation from internet access was also evident in some schools who chose to deliberately deny the music classroom any internet access, as seen in the interview participant’s case of EQ:P-6a, where the school leadership prioritised the internet connection of the general school classrooms, with the specific omission of the music classroom, until one week prior to this research interview being conducted, in preparation for the participant’s new role as Arts Amalgamation teacher. This case was representative of the 17% of classroom music teachers who are denied access to the internet despite the remainder of the school being connected to the internet. This denial of internet to the music classroom exemplified the
priorities of school leadership within Education Queensland towards the supply of services to support classroom music. Accessibility to the internet was considered valuable by all other participants due to the abundant resources available, such as YouTube, at no financial cost. This opportunity to access free resources was found to be significant for those classroom music teachers without a budget like EQ:P-6a and a business opportunity unharnessed by school leadership, to provide unlimited resources to students for zero dollars.

Classroom music teachers considered the internet to be a rich source of inexpensive and invaluable resources that required minimal ICT resources, to share music information in the music classroom, especially those classroom music teachers with no budget or were restricted to a laptop, screen and internet. This particular selection of resources, laptop, screen and internet, was found to encourage whole class learning pedagogies within the music classroom. Internet resources provided resources to music classrooms with minimal ICT resources, no budget and to overcome issues such as geographical isolation throughout Queensland however, the excessive use of whole class pedagogies identified within the research findings highlighted the dependence of music education on traditional instructional pedagogies and not as active learning experiences. In contrast, those students with access to ICT devices were able to access internet resources through their own shared or individual ICT device to complete tasks.

Participants with internet access indicated that they appreciated the internet as an inexpensive and invaluable source of resources. However, greater facilitation of the internet was found to place significant strain on the reliability of the internet as every student required the internet to access learning materials during music lessons. Half of the participating classroom music teachers (IE:P-6, EQ:P-6b and EQ:7-10) voiced concerns regarding the unreliability of internet outages. Dependability on the internet prompted a common concern which was voiced throughout this research investigation, concerning the reliability of the internet with outages which were found to be the source of major behavioural disruptions during music lessons. These outages destroyed the continuity of lessons and allowed opportunities for student misbehaviour to escalate during music lessons that operate under strict time restrictions of one
hour per week or less. The Independent primary school (IE:P-6) was the only school which was able to overcome the problem of outages using NBN and WIFI, however this was to benefit the entire school because the school reliance on internet was exceptionally high with its one-to-one device scheme and paperless school policy. This was not to benefit classroom music only.

6.2.3 Computer labs and libraries
It is reasonable to suggest that in order for classroom music teachers to implement ICT resources in music programs, classroom music teachers need to access ICT resources. Schools that chose not to supply appropriate resources or adequate quantities of resources specifically for classroom music education, commonly made ICT available within shared computer labs and libraries in designated locations throughout their school. It was found that 20% of classroom music teachers throughout Queensland had to rely on computer labs and school libraries for accessibility to ICT resources.

With the shared nature and prioritisation given to general classroom teachers, access to ICT resources within Queensland schools showed that 16% of respondents had no access to ICT for their music program, 12% relied on access to the school computer lab, 7% used the ICT resources in the school library and only 1% indicated they had 16-40 ICT devices in the music room.

The effectiveness of the organisational practice of placing a number of ICT devices in set locations for all teachers within the school to share was perceived by classroom music teachers to be inadequate for the requirements of the effective implementation of ICT in music education, due to prioritisations declared by school leadership and the lack of timetable synchronisation between computer labs, libraries and music specialist timetables for classes. These research findings supported the research of (Crawford, 2008, 2009) which found that this organisational practice failed to sufficiently and adequately provide ICT resources for music education.
One example showing the influential significance of leadership was noted in the case where interview participant (EQ:P-6b) was granted access to the computer lab every Thursday. This meant that the classroom music teacher was able to utilise the ICT resources using effective hands-on applications which promoted ICT proficiencies every Thursday, however, students attending music on other days of the week were denied ICT access due to the inaccessibility of ICT resources away from the computer lab. In this example it was evident that school leadership needs to provide the classroom music teacher with an actual physical classroom and the computer lab being the only room available, meant that ICT resources were provided to music education, not through school leadership priorities but through the necessity of providing an actual teaching space. The resulting inaccessibility of the computer lab to other staff members demonstrated the inadequacy of computer labs and libraries to supply adequate accessibility of ICT resources in adequate quantities of ICT devices to students, further supporting Crawford’s (2008) research.

Research conducted by Crawford (2009) found that within those schools that provided computer labs, classroom music teachers were restricted access to ICT devices due to time allocations, shared access and an inability to implement ICT activities within a time efficient manner that complimented the current music program with “few resources or time allocation [within 30 minute lessons] in the computer laboratory” (p. 472). This inadequacy of ICT resources for the entire school community was seen when priority was allotted to the music teacher as a result of being without a classroom, when other general classroom teachers were denied their regular access to the computer lab. This situation demonstrated the inaccessibility of ICT resources when they are provided within a computer lab rendering the practical implementation of ICT as inaccessible in the perceptions of teachers.

The organisational practice of relying on computer labs and library resources was found to demonstrate the direct influence of school leadership in providing accessibility to appropriate ICT resources and adequate quantities of ICT resources to music education, which has the capacity to positively or negatively influence the implementation of ICT in education.
6.2.4 Pedagogies incorporating ICT

The intention of the Australian Curriculum to provide all students with ICT proficiencies including ICT competence, creativity and confidence (ACARA, 2012b), suggests the utilisation of hands-on ICT learning experiences, which requires the provision of accessibility to appropriate and adequate ICT resources. The data found that whilst the majority of classroom music teachers use ICT for lesson preparation and for administrative purposes such as assessment accountability and emails, teachers were also keen to implement ICT in their music programs but were frustrated at the lack of co-operation from school leadership in supplying ICT resources which inhibited them from teaching students ICT skills. The supply of resources was found to directly affect the ability of teachers to implement ICT as well as determined the quality of teaching methodologies utilised within music programs.

A consistent pattern of hardware usage indicated that classroom music teachers showed a heavy reliance which focused on four resources: teacher laptop, projector, whiteboard and cassette player. Reasons indicated for the extensive reliance of these resources was due to the availability of resources, teacher familiarity and reliability application of the resources. The elements were found to be an immediate reflection on practical necessity, since the data identified significant deficiencies in ICT support being provided for classroom music teachers. Data also found that teachers relied predominantly on acquiring free resources from online sites via the internet, in particular, YouTube, educational websites, subject specific websites and other internet or online resources, preferring on-line sights they considered to be trouble-free. This extensive use of online internet resources highlighted the budget restraints placed on music education throughout Queensland and the need for teachers to source free resources to supplement the lack of resources within the music classroom.

This research found that teachers consistently chose to utilize these resources based on three elements of: availability, reliability and familiarity. Availability of resources referred to both the lack of accessibility to ICT resources within music classrooms and also the insufficient supply of resources in quantities sufficient for class sizes for individual students to physically engage with
a device. Reliability referred to the teachers’ perception of assurance that an ICT device would work on demand without the need for any ICT support. Familiarity referred to the teachers’ feelings of familiarity with the hardware and software so that the music program was uninterrupted by technical difficulties beyond the fixing capability of the teacher, since teachers felt unsupported by ICT support staff if any malfunction occurred during lesson times. These elements of availability, reliability and familiarity resulted in a consistent pattern favouring the use of a limited number of resources including laptop, projector, whiteboard, cassette player and internet in music education throughout Queensland.

Those classroom music teachers with ICT devices supplied in sufficient class quantities were found to be creative in their implementation of ICT within their music program. This was apparent in the field texts offered by IE:P-6, EQ:P-6b, IE:7-10, CE:7-10 and EQ:7-10 who shared their perceptions about a variety of software and apps suited to both Windows and Apple devices, with Apple being the preferred operating system. The availability, reliability and familiarity of ICT resources played a significant part in determining the methodologies classroom music teachers utilised within their music programs. Availability was found to be the most important element with the potential to determine the diverse range of ICT activities possible within music programs. Potential was increased as resource availability and resource quantities increased, with the uppermost level made possible with a 1:1 ratio of resources resulting in higher-level hands-on learning experiences within music programs. This research found that classroom music classrooms with a 1:1 student: device ratio demonstrated exceptional diversity in ICT based learning experiences. Students engaged in hands-on opportunities develop ICT proficiencies using a variety of online software and apps such as: Makey Makey, Incredibox, NoteFlight, Sibelius, Plickers, App Smash, Book Showbie, BookCreator, Sound Scapes, Garage Band, MadPad and Class NoteBook. These higher levels of hands-on engagement involving investigative pedagogical activities were evident in classrooms with greater ICT accessibility, notably 1:1 devices, which facilitated opportunities for independent creative exploration and problem solving (Crawford, 2009). Classroom music teachers with ICT accessibility in adequate quantities were creative in engaging students in real-
life learning experiences indicative of ICT in the music industry, student engagement was increased. Student behaviour issues decreased whilst fulfilling the Australian Curriculum proficiencies of compose, respond and perform.

Limited ICT resources in the music classroom were found to restrict and eliminate opportunities for student hands-on activities. Limited resources also pre-determined a heavy reliance on traditional whole-class pedagogies. Classroom music teachers restricted to a laptop, projector and whiteboard utilised these resources as a substitution for the traditional classroom blackboard whilst internet access provided cost-free on-line resources. Pedagogies were restricted to whole class instructional teaching methodologies featuring explicit teaching of music theory skills, composition, performance and modelling concepts to the whole class. Whilst the use of online information enabled the modelling of music concepts to the whole class and highlighted the resourcefulness of classroom music teachers who work within strict budget restraints, it demonstrated the impossibility for teachers to provide hands-on activities for students when ICT devices were not available to the music classroom. The use of whole class activities supports the research of Southcott and Crawford (2011), who referred to the use of ICT for whole class instruction as CAI and is a teaching strategy that is characterised by teacher guided instruction and intensive skill-development and is affiliated with high-structured teaching (Southcott & Crawford, 2011). This lack of ICT resources eliminated opportunities for higher-level learning through constructive hands-on activities and opportunities for students to develop ICT proficiencies of competence, creativity and confidence as prescribed by the Australian Curriculum (ACARA, 2012b; MCEETYA, 2008), which raises questions about pedagogy within music education and student engagement experienced in music classrooms with minimal ICT resources.

Classroom music teachers who have accessibility to ICT resources through one-to-one ICT programs were found to have creatively and enthusiastically embraced pedagogical change to implement ICT in their music program. This research found that pedagogical change involving the implementation of ICT in music classrooms was entirely dependent on the availability of ICT
resources which was reliant on supportive organisational practices and attitudes of school leadership which support the implementation of ICT in all subject areas. Teachers’ perceptions regarding the Australian Curriculum requirement to implement ICT regardless of local circumstances was mixed, due to their particular circumstances and their ability to deliver the curriculum requirements successfully.Whilst all teachers understood and agreed with the validity of implementing ICT in music, teachers considered the implementation of ICT to be an extension of current music programs in which the availability of ICT resources determined the learning experiences possible. Those teachers who had a 1:1 device ratio were able to include numerous learning activities involving ICT, whilst those teachers without adequate accessibility to ICT expressed emotions of frustration and pressure at the lack of resources and support. Some teachers admitted that the availability of ICT resources was more important than following the Australian Curriculum and that the curriculum should fit into their own program and the resources they had available and be considered as an extension of current music programs. Teachers who had access to relevant and sufficient quantities of resources that supported their music program, were more comfortable that they were able to fulfil the Australian Curriculum requirements with hands-on activities for students, whilst those teachers who lacked accessibility to ICT felt victimised and overwhelmed with the inability to fulfil the curriculum, due to a lack of support and lack of accessibility, despite a personal willingness.

This research was conducted during the second year of the mandatory curriculum in Queensland that required classroom music teachers to implement ICT in their music programs, with the intention of allowing time for the commencement of ICT implementation in music programs. This research found the implementation of ICT in music was executed inequitably throughout the state of Queensland due to individual school leadership decisions regarding the supply of ICT resources to music classrooms. The lack of ICT resources provided to music education was found to be a significant contributing factor which inhibited the implementation of ICT in music programs.
This research identified areas of concern regarding the inadequate supply of ICT resources to music education. It is reasonable to suggest that this itinerary of four resources including laptop, projector, whiteboard and internet access which promotes whole-class modelling, cannot create “practical applications” (MCEETYA, 2008, p. 13) and hands-on capabilities of students as intended by the Australian Curriculum. Denying students the opportunity to experience using an ICT device in the music classroom, denies students the involvement of hands-on activities to develop competence, creativity and confidence in music education as the Australian Curriculum prescribes (ACARA, 2010). A significant number of schools indicated their reliance on whole-class pedagogies which are necessitated by the lack of resources provided to the music classroom, even to the extent where schools expect classroom music teachers to purchase their own ICT devices, including both laptops and iPads. The deliberate omission of the music classroom from the school internet network and the provision of unreliable internet solutions, demonstrated the priorities of school leadership and the low priority given to music education.

The trend exercised by school leadership to provide music education with insufficient resources was evident within this research investigation and further supported the findings of previous research conducted by the National Review of School Music Education (NRSME) (Pascoe et al., 2005) which was conducted twelve years prior and identified a lack of ICT resources for music education. Similar research conducted by Crawford (2009) also “found a dismal lack of resources” (p. 472) were provided for classroom music education such that “many Australian students miss out on effective music education because of the lack of equity of access; lack of quality of provision; and the poor status of music in many schools” (Crawford, 2009, p. 471; Pascoe et al., 2005, p. v).

To overcome the paucity of ICT resources in music, the issue of funding for ICT purchases was investigated as part of this research, which unexpectedly resulted in the identification of the direct influence school leadership exercises over the implementation of ICT in music education and the quality of pedagogy within music education.
These findings have highlighted the inequity of music education provisioning throughout Queensland. Evident by the inadequate supply of resources within music education, the discrepancy that has existed between policies stated within the Australian Curriculum and the practical application of those policies continues to be supported by school leadership at local levels. Contrary to the intentions of the national curriculum, not all Queensland students may experience equitable educational goals that “promote equity and excellence [so that] all young Australians become successful learners, confident and creative individuals and active and informed citizens” (ACARA, 2010a, p. 1). This raises questions regarding the national curriculum’s commitment to social equity through its policy of ‘No Child Left Behind’ which acknowledges the entitlement of each Australian student to have “access to high-quality schooling regardless of gender, language, sexual orientation, pregnancy, culture, ethnicity, religion, health or disability, socioeconomic background or geographic location” (MCEETYA, 2008, p. 7) and to eliminate inequity as a determinant of educational outcomes (MCEETYA, 2008). Through this research investigation it has become evident that fourteen years after the NRSME report (Pascoe et al., 2005), institutional practices which encourage the inequity of resource distribution have continued to influence teaching pedagogies and educational experiences of Queensland students.

There is currently no prescribed music methodology for music education, however this research has shown that teachers who have accessibility to ICT resources through one-to-one ICT programs have enthusiastically embraced pedagogical change, realising that students are generally comfortable with moving beyond being passive learners and instead actively engage in constructivist learning environments (Williams, 2007). Research previously conducted by Wise et al. (2011) identified low level of usage and minimal pedagogical change in the way teachers use ICT in their classroom, however this research has identified the significant influence of the accessibility of ICT resources on the ability of classroom music teachers to implement ICT in music education. The integration of ICT within music education requires significant ICT resources, organisational practices which support the implementation of ICT and
school attitudes that support the implementation of ICT in all subject areas, all precede any pedagogical change to enable the effective implementation of ICT in the music classroom (Wise et al., 2011).

6.2.5 ICT funding
As professional educators, classroom music teachers aspire to provide educational opportunities to students that not only align with the Australian Curriculum but engage students to learn. To understand the creative aspirations of classroom music teachers, interview participants were asked if they had the resources they needed to deliver the learning experiences they would like and were there any resources they had requested or wished for. This line of questioning aimed to detect if participants felt restrained in their efforts to provide students with learning experiences they envisaged necessary to fulfil the Australian Curriculum.

Classroom music teachers identified that the lack of resources and funding for ICT resources were significant barriers inhibiting the implementation of ICT in music education. Interview participants provided a rich source of inside information of organisational practices regarding budgeting including the following information, the Catholic P-6 school (CE:P-6) and Education Queensland P-6 school (EQ:P-6a) did not have a monetary budget for music education and both of these participants expressed a strong desire for iPads so they may implement ICT in their music program but had been denied monetary support from their school Principals. It was interesting to note that only two out of the four P-6 participants were given a budget for the music department, that is Independent P-6 school (IE:P-6) and Education Queensland P-6 school (EQ:P-6b). Both of these schools required the music budget to cover expenses for any software updates, ICT purchases and services conducted by the schools own ICT department. Four schools charged students a music levy in the school fees including Independent Education P-6 school (IE:P-6), Independent Education 7-10 school (IE:7-10), Education Queensland P-6 school (EQ:P-6b) and Education Queensland 7-10 school (EQ:7-10). This music levy money was collected by the schools and used to maintain laptops and replenish laptops, to purchase apps, software and pay for updates even though these tasks were carried out by the schools own ICT
staff or librarian. Despite this music levy, purchasing decisions requested were not the prerogative of classroom music teachers since EQ:P-6b had recently requested the purchase of iPads for the music classroom which was denied and over-ruled by the Parent and Friends Association and School Leadership due to the redirection of funds to general classroom initiatives. The Education Queensland 7-10 school (EQ:7-10) music teacher was required to officially request music purchases which were “usually denied” (EQ:7-10) and any costs incurred through software purchases or maintenance conducted on ICT resources from the music department were deducted from the music levy account. Although the Independent 7-10 school (IE:7-10) did have a music budget granted by the school from school fees, the interview participant was not a part of the delegation of funds, being one teacher within The Arts Department she regarded herself as disconnected from the budgeting process. This contrasts to the Catholic 7-10 school (CE:7-10) participant who was granted a $15000 budget following a submission to school leadership outlining the educational utilisation of the resources, this teacher had received similar monetary budgets since the school had opened. The field texts collected demonstrated significant differences between the funding available for music education within each of these schools. This highlights the direct effect of funding distribution within local contexts when subject to the discretion of School Leadership which, as identified in this research, has resulted in the unequal distribution of ICT resources throughout Queensland schools.

Since the launch of the Australian Curriculum, the music subject has been considered as one subject existing under the umbrella known as The Arts, causing music to compete for financial support assigned to The Arts within individual schools. Government bodies allocated the task of fund allocation to be the responsibility of school authorities, in particular the Principal and Parents and Friends Association within individual schools. The commencement of the Australian Curriculum was done by staggered commencement and in 2016 the implementation of ICT in music education was made obligatory, deeming that classroom music teachers were professionally accountable for ICT implementation and the development of ICT proficiency of students within the music subject. In light of this research, this professional accountability
seems misdirected given that financial distribution was the responsibility of individual school authorities and subject to the prioritisation of educational initiatives such as STEM and NAPLAN, within individual schools.

This research has identified that financial support offered to music education varied considerably throughout Queensland. Whilst governments determined that school leadership may award funding according to local contexts, this investigation found that leadership priorities and attitudes towards music were significant in determining funding allocation. Field text examples presented above have highlighted organisational practices which facilitate the collection of funding for music education through school levies, but also the significance of School Leadership attitudes and the possible misdirection, delegation and utilisation of those funds. This research has found that School Leadership attitudes within local contexts, have the potential to significantly and directly influence the ability of classroom music teachers to purchase, maintain and update ICT resources and increase the availability of ICT within the music classroom. This research has provided evidence supporting classroom music teachers’ perceptions that the lack of funding directly influences the lack of available ICT resources, which significantly inhibits the implementation of ICT in music programs.

6.2.6 Defining ICT

The P-10 Australian Curriculum: The Arts-music subject has required classroom music teachers to implement ICT in their music programs since 2016. One calendar year after the mandatory commencement of The Arts Curriculum which was considered sufficient time for classroom music teachers to establish the use of ICT in their music programs, this research found that despite the compulsory nature of The Arts Curriculum, many teachers were unable to implement ICT due to a lack of ICT resources. With the lack of resources posing a significant problem in the implementation of ICT, it is logical to suggest that classroom music teachers be granted funding to purchase ICT resources, however through this investigation it became apparent that the 7-10 Australian Curriculum failed to supply a suitable definition of the term ICT relevant to music and classroom music teachers were unable to clearly define the term ICT.
This conclusion was evident in survey data provided by classroom music teachers which showed that the majority of respondents considered computers, iPads, laptops and smartboards to be ICT. It was interesting to note that participants failed to confidently identify any resources as ICT since the survey participants failed to unanimously classify any resources as ICT, as no resources received 100% in the survey data. For this reason the data demonstrated that classroom music teachers were unable to clearly define the term ICT and classify resources as ICT.

The lack of definition provided by curriculum documents was deemed to directly contribute towards the misguidance of any ICT purchasing decisions, if funding was granted. Perceptions of definition constructed by individual classroom music teachers would directly determine purchasing decisions as well as those resources chosen for implementation within music programs on a daily basis. Respondents were asked to choose from an extensive list of resource options. This research investigation identified that classroom music teachers throughout Queensland collectively perceive that computers, iPads and laptops constitute ICT as they were common to both sets of data collected during this investigation. Teachers were divided about the definition of the majority of resources suggested such as smartboards and demonstrated a recurring reference to refuted resources such as keyboards and CD players Crawford (2009).

It is a concern that classroom music teachers are unclear in how to define ICT, as this definition directly influences their choice of resources presented daily to music students. During this research investigation it was noted that classroom music teachers often substituted the term Technology for ICT to develop a sense of definition and to personally construct an understanding of what resources were considered to be ICT with some teachers using the more familiar word Technology instead of ICT. This terminology confusion may be warranted when considering the Senior Syllabus definition of ICT which states that “Information and communication technologies (ICTs) in music encompass all technologies” (QSA, 2013, p. 11). When asked to define both terms, classroom music teachers were unable to clarify each definition resorting to the explanation that ICT is connectable to a laptop or the internet. This
aligns with the definition provided by Education and Training (2009) regarding the network capabilities of computers, associated peripheral devices and software. This definition also aligns with the research findings of Southcott and Crawford (2011) who regard ICT as programmable digital resource networks. However, this definition is contradicted by the Senior Years definition which includes “traditional and electronic musical instruments, digital devices, protocols and applications” (QSA, 2013, p. 11). The inclusion of traditional instruments was disregarded by classroom music teachers, as they perceived ICT to be computer equipment to be different to musical instruments and performance equipment. This research found that the computer equipment teachers referred to, varied greatly within local contexts, which significantly influenced the abilities of classroom music teachers to implement ICT in music programs to support the development of ICT capabilities as prescribed by the Australian Curriculum. This research identified that ICT proficiencies involving the accessibility of “information, and being able to use, develop, create and communicate using the technological tools available” (QSA, 2013, p. 11) were intrinsically dependent upon the accessibility of ICT resources for hand-on implementation within music programs. Extensive curriculum content and time constraints of music lessons had forced some teachers to regard ICT as a secondary priority to their current music program, viewing ICT simply as an extension of established music programs so that curriculum content was covered satisfactorily whilst also involving Curriculum To Classroom (C2C) initiatives of compose, respond and perform. Despite the professional requirements to implement ICT in music, the majority of classroom music teachers demonstrated a realistic attitude towards the professional expectations relative to their circumstances and local contexts, constrained by restricted ICT resource availability within the music classroom.

Based on the data and field texts collected, this research found that classroom music teachers were unable to define the term ICT, which supports research previously conducted by Crawford (2009) which found that classroom music teachers were confused what resources were classified as ICT. As a result, this research found that ICT resources chosen for implementation in music were based on the tactile accessibility of resources and teachers’ perceptions of what
constituted the term ICT. Through these research results, it was evident that a P-10 definition of ICT in the context of music education was needed to clarify the definition of the term ICT, so that classroom music teachers may purchase ICT resources accurately and be confident they are implementing appropriate ICT resources in music programs, to provide students with ICT proficiencies according to the intentions of the Australian Curriculum with equity throughout Queensland. Oppositional opinions of which resources constitute ICT was a significant finding of this research and represents a weakness in the link of a unified and equitable music education in Queensland.

The inability of classroom music teachers to clarify the definition of ICT directly affects the equity in which music education may be delivered throughout the State of Queensland. It is logical to suggest that for every definition perceived by individual classroom music teachers, the probability of ambiguous interpretation increases, whilst the equity of music education is decreased. This highlights a major concern identified by this research and supports the need for a clear definition within the P-10 Australian Curriculum, to assist teachers throughout Queensland, to confidently define ICT, so that purchasing decisions and resources chosen for implementation in music programs are done with uniformity, according to the intentions of the Australian Curriculum.

According to the QSA definition, students are expected to achieve educational ICT capabilities which according to Pascoe et al., (2005) are defined as “technical and cognitive proficiency to access information, and being able to use, develop, create and communicate using the technological tools available” (p. 11). To utilise these “technical tools available” (p. 11), as identified in the qualitative field texts, participants regarded the implementation of ICT to be viewed as an extension of established music programs so they could utilise resources currently available. Given lesson time allocations, curriculum content and the current C2C initiatives of compose, respond and perform, the implementation of ICT in music programs as an extension activity of current music programs was viewed as an appropriate way to include ICT in the music syllabus by some teachers. This attitude saw ICT as a secondary priority to current music
programs and restricted the utilisation of ICT resources to those resources currently available within the music classroom. Unfortunately using resources currently available within the music classroom may not suffice for ICT according to curriculum intentions.

Classroom music teachers are professionally accountable for the implementation of ICT in music programs. The expectation that classroom music teachers will include ICT in music has placed extensive professional demands on classroom music teachers, in a subject considered primarily as non-contact for general teachers within the primary educational sector. To assist teachers throughout Queensland to comprehend their professional requirements with clarity, it is logical to suggest that the Australian Curriculum provide teachers with a clear definition of ICT within the context of P-10 music education. Having a definition of the term ICT would positively contribute to the accurate choice of ICT resources classroom music teachers purchase for music classrooms, as well as the ICT resources they need to implement in music programs. Within the Australian Curriculum the music subject represents one fifth of the Arts subjects, which has placed significant financial constraints on the availability of funding for the purchase of music classroom ICT resources. Tight budgets support the need for a definition of the ICT within the P-10 Australian Curriculum so that teachers are guided by a definition of ICT to choose ICT resources accurately and according to the requirements of the Australian Curriculum. Until the P-10 Australian Curriculum provides a definition of ICT, there will be considerable doubt over the accuracy with which individual classroom music teachers define the term ICT and whether teachers are choosing ICT resources according to the intentions of the Australian Curriculum with uniformity throughout the State of Queensland.

A major concern identified by this research includes the omission of a clear definition of ICT from the P-10 Australian Curriculum: The Arts-music subject. As a result classroom music teachers are unable to define to the term ICT which has directly affected their ability to classify resources as ICT. These findings have further supported the research findings of Crawford (2009) whose research also found that classroom music teachers were confused as to what resources may be classified as ICT. To encourage uniformity of ICT resources throughout
Queensland, a P-10 definition in the context of music education is needed to clarify the definition of the term ICT, so that classroom music teachers may choose to purchase and implement ICT resources accurately and be confident they are providing students with ICT proficiency as intended by the Australian Curriculum.

6.2.7 ICT support

In an educational environment which insists on the mandatory implementation of ICT, the reliability of ICT resources was paramount in developing confidence in classroom music teachers and encouraging the implementation of ICT with resources teachers may not be familiar with. As previously discussed, this research found that classroom music teachers consistently chose to utilise resources based on three elements of: availability, reliability and familiarity. Teachers were more comfortable and confident with performing administrative tasks on ICT and only chose to implement ICT using resources they were familiar with and considered to be reliable, which resulted in the extensive use of a limited number of ICT resources based on availability such as laptops, projectors, white boards and internet. The extensive reliance on these resources was due to the availability of resources, teacher familiarity and the problem-free application of the resources.

Classroom music teachers considered unreliable internet and unreliable ICT resources to present an unnecessary risk which resulted in time-wasting experiences in short music lessons. The unreliability of ICT resources further influenced student engagement when ICT resources did not work. The unwillingness and unavailability of ICT support staff to offer instant help when unreliable resources failed, was a significant contributing factor when understanding why teachers preferred to incorporate reliable resources in music programs.

Research conducted by Crawford (2009) found that teachers need “resources to be accessible and maintained, appropriate technological support provided and professional development encouraged” (p. 474). Within schools, ICT support staff are employed to support teachers through the installation and maintenance of ICT throughout the school. In order for classroom
music teachers to implement ICT in their music programs, the issue of ICT support is a reflection of organisational practices that can positively or negatively influence teachers in the implementation of ICT in music programs. To ascertain teachers’ perceptions regarding the ICT support they receive, survey respondents were asked to indicate who provides ICT support for the music classroom and 56% identified that no-one provided them with ICT support, 38% had no access to ICT, only 5% receive ICT support from ICT support staff, 4% from the librarian, 3% rely on their own ICT abilities, 1% rely on friends/relatives and 1% rely on other teachers for ICT support.

The majority of classroom music teachers considered the support they received from ICT staff as inadequate, as classroom music teachers consistently felt they could not rely on ICT staff for support during music lessons. Reliance on ICT staff to install software or address any ICT issues required time-consuming processes and time delays beyond the immediacy of any problem experienced within music lessons considered an emergency. For these reasons, classroom music teachers felt the necessity to restrict their ICT usage to devices they felt were reliable and were confident in their own ability to fix without the help of ICT staff. Classroom music teachers identified their major sources of ICT support to be ICT staff, librarian, other staff and family members. The unreliability of ICT support directly influenced teachers’ decisions to use minimal resources, in particular laptops, projectors, white boards and internet.

In cases where classroom music teachers needed the assistance of ICT staff, such as, the possibility of receiving a teacher laptop, or the possibility of receiving ICT support during music classes and internet issues, all participant teachers were constrained by procedures for ICT requests and experienced time delays up to weeks for support to be received. In cases where updates of software were pending, ICT staff often made executive decisions to over-ride the requests of classroom music teachers in delaying updates so that music programs were not affected. As a result classroom music teachers felt unheard in their requests to delay software updates until the end of the year, which rendered applications inoperable for months and a waste of music budget money. It was found that the role of ICT staff was implemented
inadequately and did not effectively support teachers in their efforts to implement ICT within music programs with the installation and maintenance of ICT, forcing teachers to rely on other non-ICT staff and their own personal ICT abilities.

This research found that in order for classroom music teachers to implement ICT in their music programs, organisational practices that positively support teachers in the implementation of ICT in music programs must exist before any increase in teachers’ confidence will encourage the implementation of ICT beyond the borders of reliability and familiarity. In contrast, 7-10 classroom music teachers considered their primary source of ICT support to be full-time ICT staff, where the ICT staff were employed through an independent company. Even though some requests for ICT support required participants to undergo procedures especially for time consuming requests, 7-10 participants regarded the possibility of receiving ICT support during music classes for either teacher or students as hit and miss, depending on if the ICT staff were busy. ICT staff were approachable and willing to offer ICT support for students and could be sent to ICT staff by teachers at any time or approach ICT staff themselves at any time. This perception of willingness to help, directly increased teacher confidence and willingness to experiment with less familiar devices and software.

6.2.8 Organisational practices and school leadership

To understand teachers’ perceptions of organisational practices that influence the implementation of ICT in music education, participants were asked to indicate what they perceived to be the challenges or barriers associated with using ICT in their music programs. Barriers inhibiting the inclusion of ICT were found to include: 51% access to adequate ICT resources for classes, 46% funding for ICT, 45% access to ICT resources and 40% ICT not working. From this data survey respondents identified the need for access to adequate ICT resources, ICT funding and ICT support.

Qualitative interview participants were asked about organisational practices that influence their attempts to implement ICT, to ascertain teachers’ perceptions about significant issues.
Participant responses identified the main issues significant to P-6 are the lack of ICT resources, the desire and lack of iPads, time for lesson preparation and class time, software updates rendering applications inoperable and a waste of money, reliance on ICT staff to install software, borrowing iPads from the library raises issues with saved student files, student engagement and the unreliability of internet. Participant responses significant to 7-10 classroom music teachers are the quantity of available resources and unreliable resources, time, being misunderstood, software and student engagement.

According to the Department of Education and Training [DET] (2014) it is the responsibility of school authorities to act as the primary resource providers within individual schools, by providing teachers with “professional learning and digital practice, ICT equipment and ICT support” (p. 1). This includes:

- Managing all of the ICT resources at the school, administering network servers, configuring personal computers, systems and network installations,
- ensuring availability and reliability of personal computers, systems and networks, recovering personal computers, systems and networks following faults and failures, providing support to school staff in the integration of ICT within the school. (DET., 2014, p. 1)

Findings highlighted the inadequate supply of resources. According to the Department of Education and Training (2014) it is the responsibility of school leadership to supply finances and determining the level of ICT resources within music classrooms at local levels. Their commitment involves the provision of resources for music education as well as other educational initiatives such as NAPLAN and STEM. For the benefit of their local school, it is the responsibility of school leadership to enforce school policies that are found to indirectly supply ICT devices to the music classrooms, such as BYOD schemes. This research found that BYOD schemes provide students with a 1:1 student:device ratio, which benefits the music education program and enables teachers to deliver the ICT requirements of The Arts-music curriculum.
The BYOD scheme also allows teachers and students to experience freedom to creatively engage in using ICT in music education.

The classroom music teachers’ perceptions presented in this research, are a snapshot of organisational practices being employed within Queensland schools. This research found that the teaching capabilities of classroom music teachers are significantly determined by the supply of adequate quantities of appropriate ICT resources and the continued maintenance of ICT resources. For this reason, school leadership should consider the employment of BYOD policies to supply 1:1 ICT devices to students. Further consideration should also be given to the accountability of teachers to deliver the national curriculum, given that the supply of resources has been determined as a significant issue, that classroom music teachers do not have control over. These decision making processes are the responsibility of school leadership and should therefore be the accountability of school leadership.

6.2.9  *Bring Your Own Device*

Responses from classroom music teachers showed that the most effective organisational leadership strategy used to facilitate the implementation of ICT in music education was to enforce an ICT BYOD policy throughout the school, creating a 1:1 device to student ratio and increasing the accessibility of ICT resources for students at a lower cost to the school. Those Queensland schools which offer an ICT BYOD scheme where effectively able to increase the accessibility of ICT resources for students at a lower cost to the school. Schools hosting a BYOD scheme were successful in ensuring that 40% of Queensland students use ICT devices owned by the school, allowing students to borrow devices, 13% of students purchased their own device independently and brought it to school, 4% purchased their own student laptop or iPad with a payback scheme and 3% rent an ICT device through the school, leaving 10% with no access to an ICT device.

BYOD schemes were found to successfully increase the accessibility of ICT devices, enabling each student to engage in hands on learning which enabled the development of ICT proficiency.
This was evident in responses from both P-6 and 7-10 participants who unanimously indicated that the BYOD scheme positively influenced teachers’ abilities to implement ICT in music. However the implementation of a BYOD policy was found to be inadequate without leadership attitudes which supported the BYOD policy beyond the general classroom, as it was also found that those schools with a BYOD 1:1 ratio who did not allow students to take their ICT device to music sabotaged the implementation of ICT in music and in doing so demonstrated leadership priorities and attitudes through this organisational practice. In contrast, school leadership which encouraged students to take their BYOD device to music increased the accessibility of ICT devices for students and enabled classroom music teachers to implement ICT in their music program in effective hands-on activities closely aligned with developing ICT proficiencies as stated in the Australian Curriculum.

The BYOD 1:1 device policy was found to eliminate a number of issues classroom music teachers experienced when sharing ICT equipment supplied by schools for shared access in common areas such as computer labs and school libraries. Teachers forced to reserve computer labs for ICT access were restricted, both in time availability given the scheduling of music class times and as seen in this research, by the priority restrictions placed on teachers by school leadership designed to give specific teachers advantage over others. Classroom music teachers whose students brought their devices to music classes, perceived that music education benefitted from the 1:1 BYOD school policy. By having a 1:1 device policy, all classes were able to access ICT devices in an equitable manner in keeping with the ‘No child left behind’ policy in every music class and were not restricted by booking the computer lab or competing for availability with all other classes within the school. This research also identified significant problems in sharing devices in computer labs and school libraries, especially iPads. Classroom music teachers remarked on the inability to save students’ work on shared iPads which often led to students being unable to locate their saved work in their student file because lunch-time users had wiped saved files or the student was unable to locate the same iPad they had saved their work on during the previous music lesson. Classroom music teachers perceived this type of disruption within music was reflected as a waste of time in a thirty-minute music lesson.
whilst other classroom music teachers were frustrated at the inability to develop higher-level thinking skills through quality activities due to the lack of individual device usage. These frustrations and problems saving files was not experienced by those schools which had BYOD 1:1 device policies since each student saved their own work on their own personal device, which was not touched by any other students, thus eliminating the possibility of wiped files and being unable to locate the specific iPad on which they had saved their work.

The most successful BYOD device scheme was that of Catholic Education which provided students with a device based on a payback scheme, thus enabling School Leadership to control the uniformity of devices used throughout the school. The data indicated that Catholic Education students in Queensland have the highest access to ICT due to the schools ICT scheme resulting in 50% of students being supplied with laptops and iPads owned by the school, compared to 44% of Independent Education students and 17% of Education Queensland. Education Queensland had the highest percentage frequency of 43% of students with no access to laptops or iPad. Some schools in Queensland with a BYOD policy allowed students to independently purchase their ICT device. The data showed that 20% of students in Independent Education schools buy their own ICT device through the school, 8% in Catholic Education and 1% in Education Queensland. This organisational practice commonly led to a menagerie of Windows and Apple devices being brought to the school and as a result incurred additional costs for School Leadership through the necessity of permanent computers being required in the music classrooms to cater for those students who did not possess an Apple laptop or iPad. This research found a strong preference for the Apple operating system with the use of Apple iPads and Apple laptops by classroom music teachers due to the variety and interactivity of Apple software available and suitable for music, for example Garage Band. It was interesting to note that the majority of classroom music teachers had been supplied a laptop by their school with a Windows operating system yet the majority of classroom music teachers had to privately purchase or salary sacrifice to purchase their own iPad, even though most music room programs ran on the Apple operating system. This caused some classroom music teachers confusion as to why they had been supplied with a Windows laptop and yet all of the music
programs in the school ran on Apple and led to teachers feeling unheard and misunderstood because the school did not understand or appreciate what music teachers did in their music programs.

Classroom music teachers regarded some School Leadership decisions to be based on a lack of understanding and appreciation for music education. It was felt that these decisions by school leaders were often based on the perceived benefits of STEM and NAPLAN initiatives and this was sometimes to the detriment of the music subject. The direct effect of decisions made by School Leadership and the Parents and Friends Association, were demonstrated when the school operating system was changed from Apple which according to the classroom music teachers ‘worked seamlessly’ (CE:7-10), to a Windows operating system. The reason given was due to lease agreements being renewed with higher costs incurred. The classroom music teacher was confused at this leadership decision since the costs were passed onto parents and not onto the school. Furthermore, the classroom music teacher expressed his disappointment at the leadership decision which resulted in him needing to redesign the music program using Windows and replacing his Apple based music program of which he was incredibly proud. Examples identified in the research provoked a number of negative emotions which contributed to feelings of confusion, unheard, being professionally undervalued and misunderstood as leadership made decisions which directly affected music programs without consideration of classroom music teachers and their music programs.

The data has shown how schools may successfully increase the accessibility of ICT resources through the enforcement of a BYOD school policy to establish 1:1 student to device ratio. It was evident that enforcing BYOD organisational policy and practices was a school leadership decision and was not restricted to primary verses secondary education sectors since all secondary schools had BYOD policies as well as 50% of primary schools interviewed. However, the application of this policy does not automatically guarantee the implementation of ICT in music programs, as seen in the case of CE:P-6, but relies on the organisational practices and
supportive attitudes of school leadership to enforce the accessibility of devices in non-STEM subjects, so that music education may benefit from the accessibility of ICT devices.

Attitudes of school leadership within individual schools, irrespective of whether the schools were primary or secondary institutions and irrespective of educational provider, were found to be the catalyst of prohibitive or enabling influences of school attitudes throughout individual schools. This research found that five out of seven participants depended on students to bring their own devices to music. 29% of Independent Education students bring their own ICT to the music classroom, 19% of Catholic Education students and 10% of Education Queensland students bring their own ICT device to the music classroom. Despite the mandatory implementation of ICT in music, the data indicated that 4% of music teachers have to provide their own ICT. However, the influential power of school leadership was evident when comparing the Independent Primary school to the Catholic Primary school. Both of these primary schools had a BYOD scheme giving accessibility at a ratio of 1:1 yet the influence of school attitudes in the Independent Primary school supported the use of 1:1 devices in music lessons which enabled immersive engagement with ICT, unfortunately CE:P-6 was unable to access 1:1 devices due to prohibitive school attitudes found in the Catholic Primary school which prohibited students from taking their ICT devices to music inhibiting the implementation of ICT in music programs. This example clearly demonstrates how school attitudes and organisational practices may positively or negatively influence the implementation of ICT in music programs. Differences in school attitudes and organisational practices significantly influence the ability of classroom music teachers to implement ICT in their individual schools and therefore through a denial of 1:1 ICT resources in music classrooms, have the power to directly and negatively influence the fulfilment of curriculum intentions within music education.

The research summarizes that if the intention of the Australian Curriculum is to achieve equitable use of ICT in music programs, then the attitudes and organisational practices evident within every school needs to encourage the implementation of ICT with uniformity and equity.
regardless of local context, otherwise it is impossible to obtain equity when individual schools create individual policies within individual schools.

6.2.10 Australian Curriculum
As teachers it is a professional requirement that teachers deliver the Australian Curriculum. During the semi-structured interviews, classroom music teachers were asked if they perceived the Australian Curriculum to be reasonable in expecting teachers to implement ICT in music education. This question aimed to identify issues concerning classroom music teachers regarding the implementation of ICT in music education and uncovered a number of teacher perceptions and concerns.

Interview responses identified a number of issues with which participants were concerned. Due to a lecturing position, IE:P-6 was confident that the integration of ICT in The Arts was designed to develop digital literacy through exposure to ICT devices. CE:P-6 felt frustrated at the lack of resources and support from the school community. EQ:P-6a focused on using the C2C to ensure the use of three elements: compose, respond and perform in the music program, whilst being concerned that her role of music teacher was about to change, she felt inadequately prepared or skilled for such specialized areas knowing the specialization required of a music teacher and having to suddenly teach three other specialist areas without specialized skills. This participant felt pressured into taking long service leave to plan for the Arts Curriculum she had to teach. EQ:P-6b had not looked at the Australian Curriculum for ICT but had focused on composition and performance. All participant responses from the secondary education sector revealed a more relaxed response that considered the Australian Curriculum should fit into their own program and the resources they had available. This meant that ICT was an extension of the learning already taking place and contributed to the feeling of embedded ICT. Participant responses were intrinsically connected to the accessibility of ICT resources. Those participants who perceived they had access to relevant and sufficient quantities of resources that supported their music program, were more comfortable that they were able to fulfil the Australian Curriculum requirements with hands-on activities for students, whilst those teachers who
lacked accessibility to ICT felt victimised and overwhelmed with the inability to fulfil the curriculum, due to a lack of support and lack of accessibility, despite a personal willingness.

6.2.11 Ideas verses reality
Classroom music teachers were asked to share if they felt their ideas aligned with the reality of teaching ICT in their music program. Being a creative industry it was assumed that music teachers were creative in their ideas of how and what they would like to teach using ICT in music but the investigation aimed to understand if these ideas were stifled or embraced by school environments to help classroom music teachers realise their dreams or hinder their ideas.

Participant responses from the primary sector were divided, with IE:P-6 professionally satisfied that her ideal was her reality, however all other participants requested basic ICT resources, in particular iPads. Participants in secondary education had idealistic aspirations but IE:7-10 felt unsupported in changing the reality, CE:7-10 was restrained by the direction of curriculum and EQ:7-10 found consolation that after years of asking for resources she had acquired the resources she needed to teach the music program she wanted to teach.

These responses suggested that classroom music teachers are creative in their ideas of how to incorporate ICT in music education but are professionally challenged with the task of being supplied with ICT resources to carry out those ideas. Despite the professional expectation of the Australian Curriculum and the creative ideas of classroom music teachers, school environments were found to be the catalyst with the power to support teacher ideas with resources or sabotage creative professionalism through a lack of resources. These responses from interview participants emphasized the importance of support from the school environment, so that classroom music teachers may implement ideas effectively, efficiently and professionally.
6.2.12 Teacher confidence regarding ICT

According to the Australian Curriculum the implementation of ICT in music is mandatory and the professional responsibility of classroom music teachers. This professional expectation requires classroom music teachers to feel relatively confident with using ICT, to encourage teachers to implement ICT in their music program so that students develop ICT proficiencies prescribed by the Australian Curriculum. The survey data found that respondents identified their level of confidence according to the task they performed on the ICT device: 61% felt confident using ICT for personal use, 53% felt confident using ICT for administration, 48% felt confident using ICT when teaching classroom music and 41% felt confident using ICT whilst doing Professional Development. These ICT tasks support the research of Bauer et al., (2003) who found that the “majority of music teachers use technology for school related purposes...primarily administrative [purposes] with less than thirty percent of teachers using computers during class time” (p. 290). The percentage frequency indicated 48% of respondents felt confident using ICT in the classroom, adversely indicated 51% of classroom music teachers are not confident using ICT. A consistent pattern of hardware and software usage emerged from the data, which indicated that classroom music teachers use a limited number of ICT resources based on availability such as laptop, projector, white board, Internet access and Internet resources such as YouTube. Reasons indicated for the extensive reliance of these resources was due to the availability of resources, teacher familiarity and the problem-free application of the resources. The use of a restricted number of hardware and software ICT resources, that is laptop, projector, white board and internet access, it is reasonable to suggest that since teachers consistently use a limited number of resources which are considered to be familiar and problem-free ICT, the confidence levels recorded may be elevated and therefore questionable as a true indication of teacher confidence in relation to using ICT. It is also reasonable to suggest that whilst teachers continue to use a restricted choice of ICT, it does not demonstrate that teachers are confident utilising a large range of ICT in the classroom as intended by the Australian Curriculum. Classroom music teachers were asked about strategies they perceived would increase their ICT confidence and willingness to implement ICT in the music classroom. This aimed to collate the professional needs of classroom music teachers and
support professional needs of teachers. The survey data showed that 62% of respondents indicated a need for time, 60% need access to music software, 57% need ICT for professional development, 56% need access to appropriate ICT resources to practise ICT skills, 53% need support to maintain ICT, 52% need support to set up ICT and 46% need support when using ICT in the classroom.

In order to understand the strategies teachers use to increase their ICT confidence, qualitative interview participants were asked how they had gained their level of confidence to be confident role models of ICT in the music classroom. Consistent responses from both the primary and secondary educational sectors identified that all participants had relied on self-initiated self-education, which had occurred during participants’ personal time. According to Bauer et al. (2003) professional development effectively increases music teachers’ confidence with ICT, when three intrinsic elements are provided: “teacher knowledge, teacher comfort [confidence], and frequency of teacher use (p. 289). The most significant of these elements which effectively increased teacher confidence was determined to be frequency of use (Bauer et al., 2003, p. 298). By undertaking professional development that is self-paced and relevant to ICT devices which are accessible, teachers may successfully fulfil these three intrinsic elements identified in research, successfully prescribing effective professional development that can be conducted at an individual pace, at a time convenient and applicable to the ICT device available for continued practise. Research has found that teachers require resources, skills and knowledge to develop sufficient confidence to be willing to utilise ICT in the music classroom (Hixon & Buckenmeyer, 2009). This research has shown that classroom music teachers are not satisfied with traditional ICT PD on offer from educational sources but instead have found online sources more effective and relevant to their individual needs.

6.2.13 Professional Development

The professional knowledge of classroom music teachers is initiated by the requirement that teachers attend four years of tertiary education. Throughout the course of a teacher’s career numerous hours of professional development are designed to increase the skills of classroom
music teachers applicable to changes within education. It was found that the majority of classroom music teachers felt their tertiary qualifications were inadequate in providing ICT training relevant to implementing ICT in the music classroom and according to the Australian Curriculum. This data was supplied by classroom music teachers who had graduated from tertiary education within 0-5 years and represented a large number of teachers recently completing tertiary qualifications who felt their tertiary education had inadequately prepared them for implementing ICT in music education. One reason for the dissatisfaction in tertiary educations’ ICT training was identified by this research, which showed that only nine percent of classroom music teachers received any ICT tertiary training. This was interesting to note, given that tertiary institutions act as the initial agents for teacher education, since education courses are meant to develop undergraduates’ understanding and writing of teaching materials that align with curriculum documents. As a requirement of the Australian Curriculum, the omission of ICT training in tertiary education highlights the disjointed relationship between tertiary education providers, compared to the expectations of the Australian Curriculum set by ACARA and educational providers that will employ the education graduates.

Ongoing education designed to familiarise teachers with new educational initiatives require classroom music teachers to attend a number of professional development hours per five year registration period to maintain teacher registration. Responses indicated that a significant number of classroom music teachers failed to attend any music specific ICT professional development in the 18 months prior to the collection of research data. It was interesting to note that the desire of classroom music teachers to attend professional development relevant to implementing ICT in music education had decreased to 87%, compared to previous research conducted by Bauer et al. (2003) which found that “ninety-four percent of music teachers would prefer further technology training” (p. 290). This drop in the desire to attend professional development correlated with 32% of teachers stating that the professional development offered was unsuitable.
Hixon and Buckenmeyer (2009) and Norris et al. (2003) deem professional development as unsuitable and ineffective when teachers do not have accessibility to appropriate ICT resources to practise skills learnt during professional development or when the school provides different ICT resources than the devices teachers were taught to use in professional development. A lack of sufficient quantities of ICT resources further inhibits classroom music teachers from reproducing ICT skills within the music classroom. This research found that 8% of classroom music teachers have 1-15 iPads and 1% has 16-40 iPads in the music classroom. This deficiency of ICT resources rendered iPad professional development as irrelevant for those classroom music teachers who cannot practise iPad skills learnt in professional development. This was also demonstrated by a significant correlation between professional development and having access to ICT resources to practise skills, which supported the need for teachers to have ICT resources since those who attended professional development were restricted in their opportunity to follow-up with ICT practise. This correlation supported the research findings of (Bauer et al., 2003; Crawford, 2009; Hixon & Buckenmeyer, 2009; Norris et al., 2003; Sandholtz et al., 1997; Schrum, 2001) which found that iPad professional development becomes irrelevant for the majority of music teachers because they cannot practise the iPad skills learnt during professional development. It is reasonable to suggest that without professional development being undertaken and the accessibility to practise ICT skills “little impact on the teaching and learning of music education” (Crawford, 2009, p. 473) will occur.

To understand the professional development needs of classroom music teachers, qualitative interview participants were asked to share their strategies in how they improve and maintain their ICT skills. All participants in both the primary and secondary educational sectors unanimously favoured self-paced professional development sourced from online sources such as Blogs, Facebook, Forums and Websites. Field texts showed how participants selected professional development according to ICT devices they had access to, the online professional development was self-paced, where footage “shows them what it is and let them play with it, that provides hands on activities that teachers can adapt into their classroom” (IE:P-6). As an ICT professional development provider, this participant identified that classroom music
teachers need access to ICT devices relevant for professional development sessions, so they may learn practical techniques they can practise and increase the retention rate of learnt skills. Furthermore, IE:P-6 identified that classroom music teachers need adequate quantities of appropriate ICT devices to replicate professional development within the music classroom to teach students skills learnt in professional development sessions. The issue of accessibility predominated the data regarding professional development, with the lack of resources inhibiting professional development effectiveness through the inability to practise skills and replicate ICT skills with students in hands-on activities.

This research found that classroom music teachers currently engage in self-initiated self-education during their own personal time to develop confidence and proficiency through ‘trial and error’ and relying on online sources such as Forums, YouTube and Google. This trend demonstrated that teachers perceived traditional professional development methods to be inadequate and the self-paced learning via the internet to be more relevant and valid to their individual ICT needs, which targeted skill development and proficiencies needed for specific ICT devices. Professional development was always prompted by possession of a specific ICT device, which allowed teachers to practise ICT skills learned, this meant that individual professional development was considered to be more relevant and self-paced and addressed teacher knowledge, teacher confidence and frequency of use (Bauer et al., 2003). Classroom music teachers found self-initiated professional development to be self-paced with the added advantage of being conducted at a convenient time, able to focus on specific ICT devices that are available to continue practise and reinforce ICT skills and proficiency. This highlights the importance of having accessibility to ICT devices to practise ICT skills, to extend retention of skills through practise and frequency.

This research found that classroom music teachers are not satisfied with traditional ICT professional development on offer from educational sources but instead have found online sources more effective and relevant to their individual needs. The majority of teachers perceived their university degree as inadequate preparation for implementing ICT in music
programs however, in an ever-progressing arena of technology, teachers have found internet sources to be a reliable and effective source of professional development. Attendance at traditional professional development contributes to teacher registration but this research found that teachers perceived traditional professional development as irrelevant given the lack of ICT available for practise, resulting in the majority of teachers attending no professional development events focusing on ICT implementation. This highlights the need for acknowledgement for those teachers undertaking personal develop during personal time, even though time spent on internet professional development does not accrue hours for teacher registration. This research found that classroom music teachers preferred support in the following areas and perceived effective strategies needed to increase their ICT confidence and willingness to implement a variety of ICT in the music classroom included: a need for time, access to music software, ICT for professional development, access to appropriate ICT resources to practise ICT skills, support to maintain ICT, support to set up ICT and support when using ICT in the classroom. This research found that teachers only engaged in internet professional development relative to an ICT device they physically possess and wanted to use in their music program, which addresses issues of accessibility to software and having appropriate ICT resources to practise ICT skills. The request for time may be effectively addressed by supporting teachers in their personal acquisition of self-education through the official provision of time for teachers to engage in self-paced self-initiated professional development, so teachers may target specific ICT skills, based on available ICT devices within their local context. This would eliminate costs involved in travel, employing relief teachers and paid hours attending professional development that is deemed as unsuitable and ineffective that is found to be focused on different ICT resources than the ones teachers were taught to use in professional development (Hixon & Buckenmeyer, 2009; Norris et al., 2003). It is logical to suggest that the provision of time for teachers to engage in professional development would significantly contribute to teachers’ perceptions regarding the use of familiar resources in the music classroom however, it would require school leadership support and significant organisational change in the perception of the term professional development, to move from a traditional pedagogical delivery to teachers, to an online forum. Another organisational practice in need of
restructuring was found to include: support to maintain ICT, support to set up ICT and support when using ICT in the classroom. The latter of these had a direct influence on teachers’ willingness to implement ICT in the music classroom beyond those devices they perceived to be familiar and reliable.

Through this research it became apparent that teachers perceived traditional professional development methodologies to be inadequate, compared to self-initiated self-paced internet instruction undertaken with consideration of accessibility, the ability to practise skills and replicate ICT skills with students in hands-on activities. Organisational change involving the official provision of time for teachers to undertake internet professional development would represent recognition of a new effective way to deliver professional development to teachers, to effectively address the constant changes in technology within the twenty-first century.

6.3 Overview of findings
This research journey has led me to the understanding that I am like many other classroom music teachers in Queensland. We understand the validity of ICT and are willing to incorporate ICT in music education, however there are professional standards and accountability strategies placed upon us to ensure the Australian Curriculum is delivered and students in Queensland have equal opportunity to develop ICT skills and proficiencies. Classroom music teachers in Queensland find themselves positioned between policies and the reality of implementing those policies. This research has found the implementation of ICT to be a challenging task.
Classroom music teachers in Queensland perceived the inhibiting factors associated with implementing ICT in their music program to be: the need for access to adequate ICT resources, funding and support.

The lack of available resources was found to be the most significant barrier inhibiting the implementation of ICT in music, which directly determined the ways in which ICT could be implemented in music programs. For instance, in music classrooms with 1:1 ICT devices students engaged in individual hands-on activities which developed skills and proficiencies outlined in the curriculum, but few have 1:1 devices in music. The majority of music classrooms had limited resources such as a teacher laptop, projector, whiteboard and internet, teachers which restricted pedagogy to whole-class instruction. Teachers restricted by the availability of ICT resources were forced to view the Australian Curriculum in a practical sense and treated it as complementary to their own music program and the resources they had available.
Practicality also led classroom music teachers to consistently choose to utilise resources based on three elements of: availability, reliability and familiarity. The availability of ICT resources was found to be the most important factor which was not satisfied by shared devices in the music room, computer labs and libraries since saved files were wiped or lost. Teachers favoured ICT resources they felt confident would be reliable and they were familiar with, due to a lack of ICT support in case a malfunction occurred during class times, which as every teacher knows allows opportunities for behaviour mismanagement and time wastage. Strategies to increase teacher confidence beyond using reliable and familiar ICT resources included the need for time, access to music software, ICT for professional development, access to appropriate ICT resources to practise ICT skills, support to maintain ICT, support to set up ICT and support when using ICT in the classroom. The research showed that the majority of classroom music teachers were unable to attend professional development and instead had engaged in online pedagogies for self-initiated self-paced professional development to extend their own personal ICT proficiencies during personal time. The following diagram shows how the access to adequate ICT resources, funding and ICT support affects the reasons why teacher chose ICT resources that are available, reliable and familiar and how coupled with online PD, can affect teachers confidence.

Figure 25. Resources determine music pedagogies.
During this research, it became evident that classroom music teachers rely on the support of school leadership and organisational policies that directly affect their ability to implement ICT in music programs. This research has prompted the suggestion to review the professional accountability of teachers when they have little decision making power. The research found that school leadership had a direct influence over the implementation of ICT in music education through school organisational practices, school attitudes, funding and ICT support, as shown in the following diagram. A lack of prioritization from school leadership evident through a lack of resources, funding and support directly led to classroom music teachers limiting their implementation of ICT to those resources that were available and they were confident would work.

Figure 26. School leadership decisions influence school organisational practices.
The research found that the school practice of BYOD schemes, the school attitude allowing students to take their devices to all classes, budgets allowing the purchase, maintenance and update of music software and equipment, and ICT staff expectations directly affected teachers’ willingness to venture from ICT resources perceived as reliable and familiar. The research found that the BYOD school policy provided classroom music teachers with accessibility to adequate quantities of ICT resources with diverted funding strategies and teacher confidence increased in schools where ICT support in cases of emergency malfunctions was offered.

6.4 Overview of issues identified in this research

This mixed methods research has collected quantitative survey data and qualitative semi-structured interview field texts to understand the perceptions of classroom music teachers regarding the practical issues involved in implementing ICT in music education. The following diagram is a pictorial representation of the research findings influencing the implementation of ICT in music education in Queensland and the relationship between leadership policies and the practical application of implementing ICT according to the perceptions of classroom music teachers.
Figure 27. Factors influencing the implementation of ICT in music education in Queensland.
If the intention of the Australian Curriculum is to provide an equitable education for all students throughout Queensland to develop ICT proficiency for the future, then this research could be used to guide organisational change, so that professional needs are supplied and teachers are supported in their implementation of the curriculum.

6.5 Summary
This investigation found that classroom music teachers in Queensland perceived those organisational practices which significantly inhibited the implementation of ICT in music education to include: the need for access to adequate ICT resources, ICT funding and ICT support. Accessibility of ICT resources physically inhibited students from engaging in hands-on activities designed to develop ICT proficiencies. The issue of funding directly influenced the provision of resources, contributing to the accessibility of ICT resources for music. Organisational practices involving the willingness and availability of ICT staff to support classroom music teachers directly influenced teachers’ willingness to implement ICT in music programs.

According to the research findings, classroom music teachers consistently chose to utilize these resources based on three elements of: availability, reliability and familiarity. Availability of ICT resources was found to be the most significant barrier inhibiting the implementation of ICT in music. The availability of resources directly influenced the quality of pedagogical methodologies used in music programs by determining the use of whole-class instructions verses constructive hands-on activities that engaged students whilst developing ICT proficiencies. ICT support was found to significantly influence teachers’ perceptions regarding the reliability of ICT. Classroom music teachers unanimously felt that ICT staff did not provide support in times of ICT malfunction, forcing teachers to restrict their use of ICT to reliable devices they felt confident they could fix themselves. This resulted in the restricted use of reliable and familiar ICT devices that the music teachers knew would be trouble-free and not impose on time constraints or cause disruptions within music lessons.
Strategies to increase teacher confidence beyond using reliable and familiar ICT resources, were also influenced by the availability of ICT resources, as well as: the need for time, access to music software, ICT for professional development, access to appropriate ICT resources to practise ICT skills, support to maintain ICT, support to set up ICT and support when using ICT in the classroom. Teachers were found to embrace online pedagogies for self-initiated self-paced professional development to extend their own personal ICT proficiencies. This was undertaken during personal time, prompting the need for organisational support in providing time and teacher registration acknowledgement of online professional development. During this investigation it was discovered that the majority of classroom music teachers were keen to implement ICT in their music programs but faced organisational challenges which impede their creative intentions of providing educational opportunities that align with the Australian Curriculum whilst engaging students in exceptional learning experiences.
Chapter 7: Overview and summary

7.0 Introduction
A significant motivation for this research was the deficiency in literature regarding teachers’ experiences of implementing ICT in music education. This research informs the literature, due to its focus on teachers’ perceptions and lived experiences to investigate the practical aspects of implementing ICT in schools.

This concluding chapter commences with a brief summary of the research questions that guided the study. This chapter presents a summary of the research design through a brief recount of the literature review and research design. Research findings are discussed with reference to the gaps they informed. Limitations of this research are presented. The contribution of this research investigation to related research literature considers the hierarchy and organisational structures within education and the role of school leadership as it determines the level of ICT immersion in music education. Recommendations for further research are suggested as pathways for future change, since the inclusion of ICT spreads into every specialist subject throughout education and issues identified within this study may be representative of other specialist areas and not just music education. A concluding comment provides closure to the thesis by answering the research question: What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program?

7.1 Overview of this research
7.1.1 Literature Review
As the global business sector embraced ICT, the Australian Government reacted (ACARA, 2012b; MCEETYA, 2008) by including ICT within every subject of the Australian Curriculum to develop students ICT proficiencies for future employment. The supply of resources was found to be the responsibility of school leadership within local contexts, which resulted in the inequitable supply of ICT resources within music, despite equity policies within educational
documents. Competing for funding against educational trends such as NAPLAN, MySchool and STEM, the P-10 national curriculum did not supply a definition of the term ICT within the context of music education to ascertain to necessity for resource funding for ICT devices. The inclusion of traditional instruments within the Senior Syllabus was found to be refuted within research literature and interview field texts. The practical development of ICT proficiencies was found to support constructivist pedagogies which were deemed to move education from traditional methodologies towards pedagogies aligned with technological youth. Availability of professional development was considered to be important to increase confidence and skills needed to implement ICT.

Positioned between the professional expectation of delivering curriculum policy documents and being restricted to using resources provided by school leadership, the perceptions and lived experiences of classroom music teachers have remained removed from the corpus of literature. Their valuable hands-on application of the curriculum has remained unheard, despite short-comings being documented within the NRSME (Pascoe et al., 2005) as insufficient in the provision of resources in the music education of young Australians. A review of the relevant Australian, United Kingdom and United States of America literature revealed that a substantial volume of literature focused on the variety of ICT resources suitable for music education, strategies to implement ICT in music education, pedagogical change applicable to advancing technological youth, tertiary education and professional development extending the ICT education of teachers.

The literature shares a notable and common assumption that expects classroom music teachers to already have access to ICT resources for use within their music classrooms. This lack of substantial investigation on the availability of accessible ICT resources and the practical challenges of implementing ICT in music have led to the overarching research question of this study: What do classroom music teachers perceive to be the factors that influence the implementation of ICT in their music program? To further guide the investigation, the following sub-research questions were derived:
• What are teachers’ perceptions of what ICT in music means?
• What resources do classroom music teachers currently have access to?
• How do classroom music teachers currently incorporate ICT into their music programs?
• Do classroom music teachers feel confident in using ICT in their music programs?
• What professional development do classroom music teachers believe will help them incorporate ICT into their music programs effectively?
• What practices may enhance the implementation of ICT in music education?

This study included teachers’ perceptions of their lived experiences and provided a collection of direct accounts of practical challenges and issues that have arisen when implementing ICT in music education. For this reason, teachers’ perceptions represented a valuable and untapped source of information, unknown by educational providers, school leadership or other teachers within schools. Attempts to include classroom music teachers in this research investigation presented many challenges in obtaining permission from school leadership, to allow classroom music teachers to contribute to data collection. Reasons for not allowing classroom music teachers to participate in data collection included: school leadership’s low prioritization of music, which was demonstrated by the abolition of music lessons at a number of schools in Queensland; some school leaders were unwilling to allow information regarding school resources to be shared for the purpose of data collection; some school leaders were unwilling to allow classroom music teachers non-contact time to complete the survey even though the survey was online and available outside of school hours; some school leaders apologized for their music department offering reasons based on the school culture, economic and financial determinants within their local context. A number of school leaders chose not to forward the survey invitation to their classroom music teachers, thus denying their music teachers the opportunity to share their lived experiences and perceptions. This exercise of hierarchical power suggested a sense of subordination in the role that classroom music teachers hold within schools, which was reflected in correspondence received from some School Principals justifying reasons not to pass surveys onto their classroom music teachers. Despite interference from leadership, classroom music teacher networks supported the opportunity to speak and 280
classroom music teachers answered the research questions, culminating in data being collected from Independent Education, Catholic Education and Education Queensland throughout Queensland. Data encompassed all socio-economic schools.

7.1.2 Research design
Within the framework of Explanatory Sequential Research Design, this mixed method design recorded teachers’ perceptions using a quantitative survey tool followed by qualitative semi-structured interview field texts to create depth to understanding. The combination of survey data and interview field texts facilitated an in-depth exploration of lived experiences involving the use of ICT when teaching in Queensland schools. Of particular interest to this study were: teachers’ experiences involving the accessibility of resources, quantities of ICT resources available in music lessons to facilitate hands-on learning, ICT support provided prior to using ICT in lessons and during lessons, the degree of confidence expressed by classroom music teachers regarding the application of ICT within music lessons, the frequency teachers attend professional development opportunities to develop and extend their ICT skills and the effect that professional development has had on their confidence using ICT in their classroom. Because teachers’ experiences do not happen in an isolated vacuum, teachers were found to be expressive about the effects of school practices within their school environments, which they have found to directly and indirectly influence the effective implementation of ICT in music.

The researcher analyzed the survey data using SPSS and ANOVA provided comparative analyses identifying trends between educational providers and collected data. The researcher analyzed the interview field texts utilizing IPA which allowed the researcher to adopt the role of interpreter of the findings. An analysis of the data collated from this study produced an extensive collection of themes and revealed several key findings in relation to school practices, which teachers perceived to be significant in determining the ability of teachers to implement ICT in music education.
7.1.3 Addressing the gaps

A review of the literature found a number of gaps existed when considering the implementation of ICT in music education. Through the perceptions of classroom music teachers in Queensland, this research investigation sought to address these literary shortcomings whilst gathering evidence of organisational practices within schools that affected the implementation of ICT in music education.

A review of curriculum documents found that the term ICT was not defined within the F-10 Australian Curriculum: The Arts - music syllabus. To ascertain a definition of ICT, teachers had to rely on definitions stated within other documents such as: the senior music syllabus whose reference to traditional instruments being ICT was contended within research, and ICT curriculum documents provided by the Department of Education (2014) which defined ICT as including “computers, hand held devices, computer driven peripherals, software” (p. 1). This definition may represent an indirect acknowledgement for the need for a definition by the Department of Education and may provide an answer to the gap identified within the P-10 music subject educational policy documents. This research found that the omission of an ICT definition in P-10 music education had created uncertainty among classroom music teachers, which resulted in the concurrent use of the terms ICT and technology. Responses from N=280 classroom music teachers throughout Queensland confirmed that the absence of definition had directly affected the ability of classroom music teachers to resource music classrooms and music programs, this was evident by failing to define an obvious ICT resource such as a computer with 100% confidence. Based on the research findings, it is recommended that the P-10 music syllabus be updated with a definition of the term ICT specifically for music education, so that classroom music teachers may have access to a definition of the term and may apply the definition of ICT to the purchasing of resources and the selection of resources used within music programs.

The literature review revealed that school leadership was found to be responsible for the provision of all ICT resources, to support the implementation of ICT in music education within
individual schools. This responsibility was based on an expectation that school leadership possessed an intricate knowledge of local school contexts pertaining to the provision of ICT resources and software, associated network infrastructures, professional learning and digital practise opportunities and ICT support to ensure the reliability of ICT devices (DET, 2014, p. 1). As employees of educational providers, it may be presumed that school leadership would supply adequate resources, to attain a prescribed standard of ICT implementation required by the Australian Curriculum within their local context, to support equity policies such as ‘No Child Left Behind’ and eliminate discrimination through the inadequate supply of resources. This assumption was found to represent a significant gap between policy and the reality that classroom music teachers experience in schools. Through the perceptions of classroom music teachers this research found that the prioritisation of school leadership within individual schools directly determined the distribution of finance and ICT resources to areas outside of music education, favouring Naplan, MySchool and STEM. Through the provision, availability, accessibility, quantity of ICT resources, ICT support, professional development, practise of ICT skills and organisational practices employed throughout the school, school leadership was found to directly control the degree of ICT implementation in music programs. The inadequate supply of ICT resources for music education provided by school leadership was previously identified by the NRSME (Pascoe et al., 2005), even resources supplied within shared facilities were deemed as inaccessible by music education. Despite the identification of under-resourced music classrooms, school leadership has remained in control of resource provision whilst classroom music teachers have remained accountable for music programs they may not have resources to support. Through the perceptions of classroom music teachers this research found that whilst the priorities of school leadership determined the degree of ICT implementation within local contexts, school leadership has remained unaccountable for decision making at local levels that has resulted in the unequal distribution of resources, which has fractured the equality of music education throughout Queensland.

The literature review identified that even though teachers understood the benefits of ICT through hands-on constructivist learning (Baker, 2013, p. 15), teachers were reluctant to
embrace pedagogical change to accommodate the implementation of ICT. To understand the reasons underpinning teachers’ decisions to delay the implementation of ICT, this research found that N=280 classroom music teachers were provisioned with resources suited to established methodologies such as Kodaly and Orff. The prevalence of these methodologies in music education throughout Queensland has extended over decades and during that time music classrooms have been equipped with music resources to support these music concepts and deliver these methodologies. In contrast, the perceptions of participants identified a significantly inadequate supply of ICT resources had been provided to music classrooms in support of the new curriculum initiative, even though this research occurred one year after the expected implementation of the new curriculum. The implementation of ICT represented a new curriculum initiative which required an appropriate pedagogical philosophy and methodology as well as organisational practices and resourcing, so that classroom music teachers may fully embrace change to deliver the curriculum. This research recognised that all N=280 classroom music teachers were willing to implement ICT in the capacities of teacher guided repetitive skill development as well as a creative learning tool focusing on creative exploration and problem solving (Crawford, 2009), to support the educational concepts of respond, create and perform. To develop practical skills and proficiencies in every student as intended by curriculum objectives, constructivist pedagogies support the provision of hands-on experiences (ACARA, 2012b) which requires adequate and appropriate resources. Instant feedback of ICT devices may induce instant gratification of composition and creativity in students, boosting student interest and engagement in music education. It is interesting to note that whilst classroom music teachers have been blamed for their reluctance to implement ICT and embrace pedagogical change, this research has found that classroom music teachers are professionally paralyzed by a lack of ICT resources, music education is denied access to ICT devices held in shared locations, in adequate quantities so that individual students have personal use of a device in music lessons. It is logical to suggest that teachers need access to adequate ICT resources in order to teach ICT skills and proficiencies. This highlights a significant educational discrepancy that is the responsibility of school leadership, along with the allocation of time for teachers to engage in professional development and practise ICT skills, to familiarise
themselves with devices, feel confident that devices are reliable and ICT support is available when needed.

Within the literature, the concept of professional development for teachers is supported so that classroom music teachers may demonstrate exceptional skills and confidence when modelling for ICT usage in the music classroom. Traditionally, professional development has occurred within a traditional classroom setting, with an instructor and many students eager to learn “instructional strategies” (Bauer et al., 2003, p. 290). This is ironic, when traditional pedagogies are being challenged within the classroom and teachers are being told to think beyond tradition to teach ICT in an engaging way that is better suited to new pedagogies. Whilst it is agreed that classroom music teachers need professional development, research found it is essential to provide professional development opportunities that target teacher knowledge, confidence and frequency of use (Bauer et al., 2003). These elements are only achieved when teachers possess an appropriate device and the professional development has been specifically designed to target the development of skills pertaining to that specific device. It was found that classroom music teachers were dissatisfied with professional development opportunities being offered in traditional settings and a significant number of classroom music teachers had self-initiated professional development using online tutorials. This meant that teachers were able to target a specific device, extend their knowledge and practise with the device to increase their confidence. In schools that deny access to ICT resources, targeted professional development and the opportunity to practise skills are denied by school leadership. This investigation found although a significant portion of research literature focused on pedagogical inspiration regarding the implementation of ICT, research had presumed that classroom music teachers had access to ICT devices in the music classroom. This research identified that this assumption represented a significant gap regarding the provision of resources in music classrooms and that the accessibility of ICT was a significant factor which inhibited the implementation of ICT in music education. In some schools, school leaderships’ failure to provide resources had been successfully addressed through an organisational practice involving a BYOD scheme, which created a 1:1 device ratio throughout the school, in which
students were expected to take their laptop or iPad to music classes, providing accessibility for implementing ICT in music education. This organisational practice required the support of school leadership as the research found that the BYOD scheme was ineffective in providing ICT resources to music when students were not allowed to take devices to music classes. The availability of ICT resources in music was found to have a significant influence on the quality of teaching methodologies involving the engagement of students through hands-on activities. A greater variety of software was utilised as frequency of use was influenced by the factor of familiarity, which this research found to be significant to teacher confidence in using ICT in music programs. This research found that teachers were inhibited by the unreliability of ICT and lack confidence in their ability to fix ICT malfunctions during lesson times. This apprehension was exacerbated by the unwillingness and unavailability of ICT staff to support classroom music teachers in emergencies. A review of school organisational practices involving the willingness and availability of ICT support staff to assist teachers in emergencies as well as scheduled tasks may encourage teachers to use ICT they currently will not use, because it is viewed as unreliable.

7.2 Limitations of this research

During the process of the survey data analysis, it became evident that limitations existed within the survey design and in particular some survey questions. Analysis of data suggested that some questions regarding participant background information did not contribute valuable information towards answering research sub-research questions and research questions. Although these questions helped participants feel at ease in answering survey questions, the data was not attributable to a particular research question that they had informed. One particular survey question which asked teachers about their level of confidence using ICT was deemed to be swayed by the purpose for which teachers used ICT. The survey data showed that teachers felt confident in using ICT however further questions showed that the majority of teachers used ICT for administrative tasks and not for the purpose of implementing ICT in music programs, as was the intention of the survey question. This demonstrated the limitations of designing survey questions to be asked simultaneously in one survey and not conducting a
second survey at a later date to allow time to adjust questions as data uncovered unexpected findings.

A significant limitation was found during the distribution of the online survey. Part of the ethical process required the researcher to contact School Principals by email and ask them to forward the survey link to their classroom music teachers. A number of Principals refused to pass the survey link onto their classroom music teachers, denying classroom music teachers the opportunity to participate in the survey and voice their contribution to the research.

7.3 Contribution to related research

7.3.1 Hierarchy within education

The delivery of the Australian Curriculum: The Arts – music subject is an expectation and responsibility of professional educators from all three educational providers including: Independent Education, Catholic Education and Education Queensland. As declared by the Department of Education and Training (2014) the distribution of funding was decreed to be the responsibility of school leadership due to a greater understanding of needs within local contexts. This declaration has positioned classroom music teachers as being professionally susceptible to school leadership decisions and educational trends. Financial judgements determined at local leadership levels constitute the educational outcomes, which determine the discourse from curriculum policies to outcomes of music programs within Queensland. This study found that the influence of local decisions significantly contributed to the creation of inequitable provisioning of resources throughout Queensland schools. This study which was conducted in 2017 was found to support the findings of the NRSME (Pascoe et al., 2005) which reported a lack of resources for music education existed twelve years earlier and determined that some students were denied access to resources in music education. The findings from this study proposed that the resulting inequitable provision of resources undermined the intention of having a national curriculum, since every child is not assured of equivalent educational outcomes, as stated in policy documents (ACARA, 2012b).
7.3.2 *School leadership determines immersion of ICT in music education*

Key findings from this investigation determined that classroom music teachers perceived the major inhibiting factors associated with implementing ICT in their music program to be: the need for access to adequate ICT resources, ICT funding and ICT support. All of these factors rely on favourable local decision making to supply adequate quantities of resources and ensure they are available to music classrooms without sharing restrictions. BYOD policies were found to effectively create 1:1 device to student ratio, which directly dictated the facilitation of individual hands-on activities to develop ICT proficiencies outlined in the curriculum. Those music programs with restricted resources were found to be characteristic of research findings that proposed the need for significant pedagogical change suitable for technological students. Further findings suggest that music classrooms without accessibility and adequate resources are unable to immerse ICT in music education, which is unrelated to classroom music teachers’ willingness to do so, but directly related to school leaderships’ resource provision. Data also found that organisational practices involving the job expectations of ICT staff within schools are significant in developing a sense of reliability, to reassure classroom music teachers they are supported when using ICT in their classrooms. In particular, teachers felt more confident knowing that ICT staff would come to help if devices suffered any malfunction during lesson times. This was found in Independent and Catholic 7-10 schools whilst all P-6 schools failed to reassure their teachers they were supported by ICT staff. Time was determined as a strategy to increase confidence and familiarity, by granting teachers time to explore online professional development and practise ICT skills and allocate professional learning time to teacher registration however, the allocation of non-contact time is again the responsibility of school leadership.

7.4 *Recommendations for future research*

It is evident from the findings that a review of teacher accountability is needed as it is unreasonable to hold classroom music teachers professionally accountable for the implementation of ICT, when teachers are marionettes of school leadership decision making.
Policy directions from Education Providers that guide the decisions of School Leadership within local contexts, would benefit classroom music teachers in the implementation of ICT in music education. Contrary to the intention of the Australian Curriculum’s equity policies, the research found that the implementation of ICT in music was executed inequitably throughout the State of Queensland due to the delegation of responsibility to individual school leadership within local contexts. It is proposed, to encourage a more unified leadership throughout the State of Queensland, Educational Providers may need to outline organisational practices to enforce BYOD schemes to provide accessibility to adequate quantities of ICT resources in a 1:1 ratio. This will require self-reflection of school attitudes so that school leadership encourages students to take their individual devices to music. A review of ICT staff job descriptions may also be updated to increase teachers’ confidence in the ICT support offered during emergencies for ICT malfunctions during classes and in doing so increase teachers willingness to incorporate a greater variety of ICT resources that may be available. To support classroom music teachers to engage in online self-directed learning for the benefit of implementing ICT in music education may include the official provision of time and accrualment of teacher registration hours for online professional development. Clarification of F-10 definition of ICT in music education is needed in curriculum documents so that classroom music teachers may purchase and incorporate ICT resources accurately. It is necessary that these changes to organisational practices be stated by Educational Providers in policy documents, as a directive to School Leadership, so that the delivery of the Australian Curriculum may be delivered with greater equity as intended by the national curriculum, as shown in Figure 26.
During this research it became evident that the role of school leadership was significant in determining the level of implementation of ICT within the school and music education. Future research needs to focus on the role of school leadership in the integration of ICT in music education, in the areas of accessibility of ICT resources in adequate quantities for class groups, funding for music education, a review of school attitudes to support teachers in various levels of need, the adjustment of job descriptions of ICT staff to support teachers experiencing ICT malfunctions during class times, time allocation for teacher professional development for online self-initiated professional development, time accruement for teacher registration of online professional development and engaging in school practices that consider music programs when updating software and choosing operating systems for school BYOD schemes, demonstrating school attitudes that are inclusive of music education in the provision of internet and resources to encourage and facilitate the implementation of ICT in music education.
By investigating the implementation factors that provide positive and negative support, issues identified within this research may also be insightful and transferable to the implementation of ICT within other specialist subject areas in education.

7.5 Conclusion

This study represents a contribution to Australian research literature in the field of music education and ICT. This research sought to gather the perceptions of classroom music teachers in Queensland, to identify organisational practices within schools which directly affect the implementation of ICT in music programs. Data collection engaged classroom music teachers, in the form of recollections of lived experiences and perceptions, were gathered in a way which respected participants as music specialists with unique knowledge exclusive to classroom music. A snapshot of ICT implementation in music education was constructed by gathering survey data from N=280 voluntary classroom music teachers, which created an extensive inventory of ICT resources in music classrooms and interviews with 7 classroom music teachers representing all educational providers including: Independent Education, Catholic Education and Education Queensland. This provided an ideal snapshot of teachers’ perceptions of working conditions they endure to deliver the curriculum and provide the best learning opportunities for students, whilst exploring the correlated differences between educational providers and primary or secondary sectors.

Expectations within education that assume classroom music teachers are simply able to implement ICT and require professional accountability policies to motivate and ensure teachers deliver the curriculum, presumes that teachers are defiant against change. Data collected for this research does not support this assumption, instead, it was found that teachers engage in self-initiated self-paced online professional development to extend their own personal ICT proficiencies so they may engage students in exceptional learning experiences to develop ICT proficiencies. This occurred when school leadership failed to provide satisfactory professional development opportunities, just as teachers purchased their own iPads when necessary resources were not supplied. The findings further suggest that classroom music teachers are
marionettes in education, constricted by curriculum, professional standard policies and school leadership decision making. Teachers are conflicted between their need to deliver the curriculum, whilst they are deprived of a definition of the term ICT and denied organisational practices and resources which support them in their implementation of the curriculum, in particular, the supply of ICT resources, ICT support and professional development. As a result, a lack of ICT implementation has led to pedagogical methodologies being questioned, with research calling for more contemporary methodologies aligned with current ICT proficiencies.

When exploring teachers’ perceptions regarding the implementation of ICT in music, through the lens of their own lived experiences, it became evident that classroom music teachers were keen to implement ICT in their music programs. This research found that Queensland classroom music teachers perceived they are constricted by inhibiting factors including: the need for access to adequate ICT resources, ICT funding and ICT support. Classroom music teachers favoured resources based on: availability, reliability and familiarity. The availability of ICT devices was found to directly determine the ways in which ICT could be implemented with shared devices being an unsatisfactory answer to the supply of resources. Reliability and familiarity were found to be intrinsic to teacher confidence, which also relied on the provision of: time, ICT for professional development, access to appropriate ICT resources, ICT support to conduct maintenance, installations and emergencies during class times.

This research has used classroom music teachers’ perceptions and experiences to provide the literary body of knowledge with an insight into the practical issues that have influenced the implementation of ICT in music education. More importantly, this research has identified those responsible for organisational practices and decisions which directly influence and determine ICT implementation in music education.

School leadership is currently responsible for the provision of resources given to classroom music teachers in local contexts. For this reason, school leadership represents the source of inequity within the State of Queensland. By allowing individual schools to be subjected to local
decision-making, school leadership determines the degree of ICT implementation influenced by each Principal’s priorities creating inequity in curriculum delivery. Within the hierarchy of education, educational providers possess the power to unify school leadership decisions by setting expected guidelines and standards, similar to professional standards placed on teachers. Standards placed upon school leadership need to outline expectations which address the inhibiting factors identified by this research. These include: access to adequate ICT resources with a 1:1 student to ICT device ratio, ICT funding, ICT support, the development of organisational practices which encourage availability, reliability and familiarity of ICT resources.

This research has provided educational providers and school leadership with an opportunity to make a positive and effective contribution to future improvements in music education. By addressing the findings of this research, educational providers and school leadership may provide effective support through organisational practices, so that classroom music teachers may do their job efficaciously and turn professional frustration into professional fulfilment.

In section 2.2, reference was made to the work of the OECD and the recommendation to implement ICT to avoid exclusion from global advancement. Exclusion referred to both a lack of skills as well as a lack of access to ICT resources. McNair (2000) found that flooding education with ICT funding does not guarantee the development of ICT proficiencies or inclusion. This research has found that despite financial investment from the Australian Government through grants for ICT, the provision of ICT funding has not saturated schools with ICT as intended, with some subjects being more equal than others and sadly some students more privileged than others. This inequality has been created through system delegation and leadership responsibility that has resulted in a lack of ICT resources in music education. This research has found that the implementation of ICT is constrained through a lack of resources, funding and support. These attributes have the capacity to directly influence the effectiveness of ICT implementation within Queensland music education, which has the ability to directly influence the degree of exclusion Australia will experience within the global market as it advances toward the future.
References


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Appendices

Appendix A: Ethics clearance approval from Griffith University

11/30/16

GRiffith University Human Research Ethics Committee

Dear Dr Georgina Barton

I write in relation to your application for ethical clearance for your project "Teachers' perspectives about implementing ICT in music education" (GU Ref No: 2016/783). The research ethics reviewers resolved to grant your application a clearance status of "Fully Approved".

This is to confirm receipt of the remaining required information, assurances or amendments to this protocol.

Consequently, I reconfirm my earlier advice that you are authorised to immediately commence this research on this basis.

The standard conditions of approval attached to our previous correspondence about this protocol continue to apply.

Regards

Kim Madison | Human Research Ethics

Office for Research
Griffith University | Nathan | QLD 4111 | Level 0, Bray Centre (N54)
T +61 7 373 58043 | email k.madison@griffith.edu.au

Researchers are reminded that the Griffith University Code for the Responsible Conduct of Research provides guidance to researchers in areas such as conflict of interest, authorship, storage of data, & the training of research students.

You can find further information, resources and a link to the University's Code by visiting Griffith's webpage: Griffith University Code for the Responsible Conduct of Research

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Appendix B: Approval to conduct research: STRATPOL

1 March 2017

Miss Anne-Maree Eyles
Griffith University
76 Stallone Cct
MCDOVALL QLD 4053

Dear Anne-Maree,

Thank you for your application seeking approval to conduct research in Queensland state schools titled *Teachers’ perspectives about implementing ICT in music education*. I wish to advise that your application to invite research participants to be involved in your study has been approved. This letter gives you approval to approach potential research participants only.

You may approach principals of the schools nominated in your application and invite them to participate in your research project. In the first instance, please provide principals of these schools with the attached letter which provides important information to help inform their decision about whether they wish to participate in this study. Your approval is conditional upon provision of this letter to each of the school principals you have nominated (you may need to photocopy the attached letter to provide sufficient copies for all principals).

As detailed in the Department’s research guidelines the following applies to the study:

- You need to obtain consent from the relevant principals before your research project can commence.
- Principals have the right to decline participation if they consider that the research will cause undue disruption to educational programs in their schools.
- Principals have the right to monitor any research activities conducted in their facilities and can withdraw their support at any time.

This approval has been granted on the basis of the information you have provided in your research proposal and is subject to the conditions detailed below.

- Any changes required by your institution’s ethics committee must be submitted to the Department of Education and Training for consideration before you proceed. Conversely, any changes required by the Department must be submitted to your institution’s ethics committee to ensure you are not in breach of your ethics approval.
- Any variations to the research proposal as originally submitted, including changes to the research team, changes to data collection, additional research undertaken with the data, or publication based on the data beyond what is normally associated...
with academic studies, should be submitted to the research officer via email. Significant variations will require the submission of a new application.

- Papers and articles intended for publication that are based on data collected from Queensland state schools and/or Departmental sites should be provided to the Department for comment before release.

- Under no circumstances should any publications disclose the names of individuals or schools.

- You are required to contact the Department if you are contacted by the media about research activities conducted on Departmental sites or if you intend to issue a media release about the study.

- At the conclusion of your study you are required to provide this Office and principals of participating schools with a summary of your research results and any associated published papers or materials in hard copy. You are also requested to submit the documents in electronic format, or provide a link to an online location if possible, to research.stratpol@det.qld.gov.au. Failure to provide a report on your research will preclude you from undertaking any future research in Queensland state schools.

Please note that this letter constitutes approval to invite principals and teachers to participate in the research project as outlined in your research application. This approval does not constitute ethics approval or support for the general and commercial use of an intervention or curriculum program, software program or other enterprise that you may be evaluating as part of your research.

Research Services values your input into the research application process and is seeking your responses through the enclosed short feedback form. It is hoped that this feedback will enable Research Services to effectively assess whether its processes are efficiently streamlined, transparent and mutually beneficial to all stakeholders.

Should you require further information on the research application process, please feel free to contact Tanya Murray, Senior Research Officer, Strategic Policy and Intergovernmental Relations on (07) 3034 5945. Please quote the file number 550/27/1830 in future correspondence.

I wish your study every success.

Yours sincerely,

[Blank]

Dr Angela Ferguson
Director
Research Services
Strategic Policy and Intergovernmental Relations
Appendix C: Approval to conduct research: CATHOLIC EDUCATION Diocese of Brisbane

Catholic Education
Archdiocese of Brisbane
teaching • challenging • transforming

Ref. 239
20 February 2017

Miss Anne-Marie Eyles
School of Education and Professional Studies
Griffith University
Mt. Gravatt QLD 4122

Dear Miss Eyles,

The Brisbane Catholic Education Research Committee has met and considered your application to conduct the research titled, Teachers’ perspectives about implementing ICT in music education.

The Committee has approved your application on the basis that you will highlight the ‘G-week disruption’ in the information sheet for principal, teachers, parents and students.

Please provide the school principals a copy of this approval letter.

The participation in your project is at the discretion of the principals. Should any of the schools not wish to participate, please advise this office the name of the school for record purposes.

It is a requirement for all researchers to provide a full report to Brisbane Catholic Education when the study is finalised. Reference number 239 has been allocated to your project - please quote this when making contact with this office.

If you have any further queries, please contact Research Brisbane Catholic Education on 07 3033 7586.

Best wishes for the successful completion of your research project.

Yours sincerely

Donalee Moriatry
Chief Enterprise Governance and Performance Officer
Office of the Executive Director
Brisbane Catholic Education
Archdiocese of Brisbane
Appendix D: Approval to conduct research: CATHOLIC EDUCATION Diocese of Cairns

20 July 2017

Anne-Marie Elyes
76 Stallone Circuit
MCDOWALL QLD 4053

Via email: daisin@gmail.com

Dear Ms Elyes

Thank you for your application requesting permission to conduct research in Catholic schools throughout the Diocese of Cairns.

Permission is granted to conduct the research involving facilitation of online surveys to be completed by classroom music teachers. This approval is subject to acceptance by the Principal at each individual school.

We wish you well in this research.

If I can be of further assistance, please do not hesitate to contact me.

Yours sincerely

[Signature]

URSULA ELMS
ASSISTANT EXECUTIVE DIRECTOR – LEARNING AND TEACHING

cc. Kay Hartwig (via email – k.hartwig@griffith.edu.au)
Georgina Barton (via email – g.barton@griffith.edu.au)
Appendix E: Approval to conduct research: CATHOLIC EDUCATION Diocese of Rockhampton

Ms Anne Maree Eyles
Doctorate Student
Griffith University
McDowall Qld
Via email: daisiji@gmail.com

23 January 2017

Dear Anne Maree

Thank you for your recent application to conduct research in relation to, “Teachers’ perspectives about implementing ICT in music education”, and your request to conduct this research within Catholic Schools and Colleges in the Catholic Diocese of Rockhampton. Please be aware that St Brendan’s College and St Ursula’s College Yeppoon, do not come under the governance of this office and separate application would need to be made to these colleges.

I am pleased to advise that following discussions with Panel your Application to conduct this Research Project has been successful. Please note that it will be at the discretion of the respective school Principal to provide the final approval.

Should you require any further information please contact Neil McDonald Executive Assistant to the Director who would be more than happy to assist.

Kind regards

Leesa M Jeffcoat AM
DIRECTOR CATHOLIC EDUCATION – Diocese of Rockhampton
Appendix F: Approval to conduct research: CATHOLIC EDUCATION Diocese of Toowoomba

24 January 2017

Ms Anne-Maree Eyles
76 Stallone Crt
MACDOWELL QLD 4053

Dear Anne-Maree

Re: Research Project – Teachers’ perspectives about implementing ICT in music education

Thank you for your application received at this Office on 17 January 2017 requesting permission to conduct research in Catholic schools in the Diocese of Toowoomba.

I give in principle approval for you to conduct this research in Catholic schools under the jurisdiction of this Office following:

- agreement with the requested changes and information outlined below; and
- approval from individual school principals and classroom music teachers.

Identifying schools with classroom music teachers

The Catholic schools listed below have dedicated classroom music teachers. In all other primary schools, the general classroom teacher teaches music to their class. From your research application, I believe that you are focusing on teachers employed specifically to teach classroom music and hence the provision of this list.

- St Francis de Sales School, Clifton
- Our Lady of the Southern Cross College, Dalby
- St Mary’s School, Goondiwindi
- Mary Mackillop Catholic College, Highfields
- St Monica’s School, Oakey
- St John’s School, Roma
- St Joseph’s School, Stanthorpe
- Our Lady of Lourdes Primary School, Toowoomba
- Mater Dei Primary School, Toowoomba
- Sacred Heart Primary School, Toowoomba
- St Anthony’s School, Toowoomba
- St Joseph’s College, Toowoomba
- St Mary’s College, Toowoomba
- St Saviour’s College, Toowoomba
- St Saviour’s Primary School, Toowoomba
- Assumption College, Warwick
- St Mary’s School, Warwick

Principal/Teacher information sheet – requested changes

In the section titled ‘Why is this research being conducted?’, I request the following changes so that schools understand that this research’s origin is your Doctoral studies and that the potential use of data and findings is a suggestion and not an expectation of Toowoomba Catholic Schools, its principals or participating teacher/s.
Why is this research being conducted?
The aim of this project is to ask Foundation to Year 10 (F-10) classroom music teachers what practical issues positively and/or negatively influence the implementation of Information and Communication Technology (ICT) in music education.

As such the project will aim to answer the following questions:
1. What are the ICT resources and practices that exist in current music programs?
2. What are teachers’ perceptions of the meaning of ICT and how should ICT be implemented in music education?
3. What practices may enhance the implementation of ICT in the music education?

Benefits to the student researcher
This research forms a component of the student researchers’ Doctor of Education academic program requirements.

Potential benefits to participating schools and teachers
This project may assist your school in identifying organisational practices that require re-evaluation to ensure teachers are supported appropriately when implementing ICT in music programs. This information may also be valid for other educational subjects within schools.

Benefits to teachers through participation in this research may include: having the opportunity to voice opinions about school processes; making a contribution to improving organisational practices involving ICT in the school.

In the Feedback to you section, you indicate that schools can request a summary of the results. As is explained in the Research Guidelines, a general condition of conducting research in our schools is that the upon completion of the research, the researcher provides the schools in which the research was conducted with a summary of the findings. Therefore, I ask that this is reflected in this section of the information sheet.

I wish you well for your research and will inform the principals of the listed schools of this in principle approval and provide them with copies of your research proposal.

I look forward to receiving a copy of your final report and your findings.

Yours sincerely

Dr Patrick Coughlan
Executive Director: Catholic Schools
Diocese of Toowoomba
Appendix G: Approval to conduct research: CATHOLIC EDUCATION Diocese of Townsville

15/03/2017

Kay Hartwig
Griffith University

Email: dajsjn@gmail.com

Dear Kay

Research Application Reference Number: 2017-03
Research Application: Teachers' perspectives about implementing ICT in music education

Our Research Approval Team has recently reviewed the above application to conduct research. Upon their recommendation, I am happy to give permission for you to approach Principals of schools within the Diocese of Townsville.

Yours sincerely

[Signature]
Dr Cathy Day
Executive Director
Teachers’ perspectives about implementing ICT in music education

PRINCIPAL INFORMATION SHEET

<table>
<thead>
<tr>
<th>Who is conducting the research</th>
<th>Griffith University: School of Education</th>
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<tbody>
<tr>
<td>Chief Investigator:</td>
<td>Kay Hartwig</td>
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<td></td>
<td><a href="mailto:k.hartwig@griffith.edu.au">k.hartwig@griffith.edu.au</a></td>
</tr>
<tr>
<td>Student researcher:</td>
<td>Anne-Maree Eyles</td>
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<td></td>
<td>Mobile: 0403 709 033</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:anne-maree.eyles@griffithuni.edu.au">anne-maree.eyles@griffithuni.edu.au</a></td>
</tr>
</tbody>
</table>

Griffith University Human Research Ethics reference number: 2016/783

Why is the research being conducted?

The aim of this project is to ask Foundation to Year 10 (F-10) classroom music teachers what practical issues positively and/or negatively influence the implementation of Information and Communication Technology (ICT) in music education. This project will assist your school in identifying organisational practices that require re-evaluation, to ensure teachers are supported appropriately when implementing ICT in music programs. This information may also be valid for other educational subjects within schools.

As such the project will aim to answer the following questions:

1. What are the ICT resources and practices that exist in current music programs?
2. What are teachers’ perceptions of the meaning of ICT and how should ICT be implemented in music education?
3. What practices may enhance the implementation of ICT in the music education?

What you will be asked to do

In Semester 1 2017, the classroom music teacher will be asked to complete a survey which will take approximately 20-30 minutes. In Semester 2 2017, there is a slight possibility that the classroom teacher may be asked to attend an interview to help provide deeper investigation into themes that have been identified from quantitative data collected during the survey. The aim is to understand the perceptions of those involved in the one-to-one interview, in order to report on factors that influence the implementation of ICT in music education. Each interview will take approximately 30-45 minutes and will occur at your school at a time convenient for you.

The researchers ask that the School Principal distributes the survey to their classroom music teacher(s) on behalf of the researchers and be assured that the researchers have not been given the names or contact details of any staff members.
The expected benefits of the research

Your participation in this research will offer some leadership benefits to you and your school. Benefits include: developing a greater understanding of the needs of classroom music teachers regarding the implementation of ICT in your school; the findings of the research may also indirectly contribute to the implementation of ICT in other subject areas; you will also have the opportunity to voice your opinions about school processes; you will be making a contribution to improving organisational practices involving ICT in the school.

Risks to you

There is very little risk to you participating in this project.

Your confidentiality

It is the intention of the research to maintain the anonymity of all classroom music teachers and schools. As the only classroom music teacher at your school it is possible that your comments may be identifiable. However, any identifiable information collected by the research will be coded for the protection of anonymity, with details being known only to the researcher. If the need for using identifiable comments arises, your permission will be sought before using comments in the reporting where you are clearly identifiable.

It is very likely that information and reports from this research will be presented at conferences and published in journal articles. You will not be able to be identified in any forms of publication or reporting. Your name would never be used.

All of the data collected in this research project will be stored in a locked filing cabinet or on a computer that is password protected. The researcher will control access to all data. Supervisors at the university who may help with data analysis will have access to the de-identified data only, that means your research name/number will be used, not your real name. The researcher will check with you during the interview to clarify the main points being made. Transcripts will be available at any time for you to check the intended meaning with the transcription.

“All audio recordings will be erased after transcription. However, other research data (interview transcripts and analysis) will be retained in a locked cabinet and/or a password protected electronic file at Griffith University for a period of five years before being destroyed” (rims@griffith.edu.au). Deletion of research data will occur according to Griffith University guidelines to ensure that data is safely deleted for the protection of participants.

Your participation is voluntary

Your participation in this project is highly valued, but is totally voluntary. You are free to leave the project, or change your level of involvement at any time without reason.

Questions / further information

You may wish to make an appointment to ask any questions. You can also contact the researcher by email at anne-maree.eyles@griffithuni.edu.au if you require any further information.
The ethical conduct of this research

The project is being conducted by a research student at Griffith University in accordance with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the ethical conduct of the research project you can contact the Manager, Research Ethics on 07 3735 4375 or research-ethics@griffith.edu.au. The Griffith University Human Research Ethics reference number of this research is 2016/783.

Feedback to you

The educational provider will receive a report containing the overall findings and results of the research. A summary of the results will be available to schools upon request by emailing the student researcher at anne-maree.eyes@griffithuni.edu.au.

Privacy Statement – non disclosure

“The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University’s Privacy Plan at http://www.griffith.edu.au/privacy-plan or telephone (07) 3735 4375”.

Benefits to the Student Researcher

This research forms a component of the student researchers’ Doctor of Education academic program requirements.

Consent of participant

Completion of the on-line survey will be regarded as consent being granted by the participant. Consent for the interview will require the completion of the Teacher Consent Form
Teachers’ perspectives about implementing ICT in music education

TEACHER INFORMATION SHEET

| Who is conducting the research | Griffith University: School of Education | Chief Investigator: Kay Hartwig
|                               |                                           | k.hartwig@griffith.edu.au |
|                               | Student researcher: Anne-Maree Eyles     | Mobile: 0403 709 033      |
|                               |                                             | anne-maree.eyles@griffithuni.edu.au |

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Feedback to you

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Appen\textit{dix J: Teacher consent form}

\begin{center}
\includegraphics[width=\textwidth]{Griffith_University_logo.png}
\end{center}

\textbf{Teachers’ perspectives about implementing ICT in music education}

\section*{TEACHER CONSENT FORM}

<table>
<thead>
<tr>
<th>Research Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griffith University: School of Education</td>
</tr>
<tr>
<td>Chief Investigator: Kay Hartwig</td>
</tr>
<tr>
<td><a href="mailto:k.hartwig@griffith.edu.au">k.hartwig@griffith.edu.au</a></td>
</tr>
<tr>
<td>Student researcher: Anne-Maree Eyles</td>
</tr>
<tr>
<td>Mobile: 0403 709 033</td>
</tr>
<tr>
<td><a href="mailto:anne-maree.eyles@griffithuni.edu.au">anne-maree.eyles@griffithuni.edu.au</a></td>
</tr>
</tbody>
</table>

Griffith University Human Research Ethics reference number: 2016/783

By signing below, I confirm that I have read and understood the information package and in particular have noted that:

- I understand that my involvement in this research will include the possibility of being interviewed once during Semester 2, 2017.
- I have had any questions answered to my satisfaction;
- I understand the risks involved;
- I understand that there will be minimal benefit to me from my participation in this research but it will benefit the school;
- I understand that my participation in this research is voluntary;
- I understand that if I have any additional questions I can contact the research team;
- I understand that I am free to withdraw at any time, without explanation or penalty;
- I understand that I can contact the Manager, Research Ethics 07 3735 4375 or research-ethics@griffith.edu.au if I have any concerns about the ethical conduct of the project; and
- I agree to participate in the project.

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
</tr>
<tr>
<td>Date</td>
</tr>
</tbody>
</table>

220
Appendix K: Quantitative survey questions

SURVEY

Classroom music teachers’ perspectives about implementing ICT in music education

What do classroom music teachers perceive to be the factors that positively and negatively influence the implementation of ICT in their music program?
### Section A  Teacher Background Information

These questions are about you, your education and the time you have spent in teaching. In responding to the questions, please mark the appropriate box.

1. **What is your gender?**
   - Female
   - Male

2. **How long have you been working as a classroom music teacher?**
   - First year
   - 1-2 years
   - 3-5 years
   - 6-10 years
   - 11-15 years
   - 16-20 years
   - 20 years+

3. **Question**
   - Yes
   - No
   **Question**
   - Number of schools

   **Do you currently work as a classroom music teacher at more than one school?**

   **At how many schools do you currently work as a classroom music teacher?**

4. **What is the highest formal music qualification you have completed?**
   - No music qualification
   - AMEB of Trinity Grades
   - Diploma
   - Bachelor
   - Masters
   - Doctorate
   - Other:

5. **What is your music background? (tick more than one if applicable)**
   - Play an instrument
   - Instrumental teacher
   - Professional musician
   - Play in music group/ensemble/orchestra
   - Tour with music artist
   - Choral conductor
   - Instrumental conductor
   - Composer
   - Accompanist

---

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Section B  School Information

Please choose ONE of the schools you teach classroom music to complete the survey. These questions are about the school where you teach classroom music. In responding to the questions, please mark the appropriate box.

6. Where is your school located?
   Suburb  Town/City  State

7. Who is the Educational Provider?
   Department of Education  Catholic Education  Independent Education  Other

8. What year levels are taught at your school?
   Prep to Year 6  Prep to Year 12  Year 5 to Year 12  Year 7 to Year 12  Other

9. How many students attend your school?

10. Where are your classroom music lessons held?
    Designated music classroom  Hall  OSHC room  Classrooms  Other

11. What resources does your school provide the music classroom?

<table>
<thead>
<tr>
<th>Resource</th>
<th>Yes</th>
<th>Not</th>
<th>Resource</th>
<th>Yes</th>
<th>Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untuned percussion</td>
<td></td>
<td></td>
<td>Microphones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuned percussion</td>
<td></td>
<td></td>
<td>Electric drum kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukuleles / Guitars</td>
<td></td>
<td></td>
<td>Projector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric guitars</td>
<td></td>
<td></td>
<td>White board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyboards</td>
<td></td>
<td></td>
<td>Smart board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers</td>
<td></td>
<td></td>
<td>Recording Studio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iPads (for classroom music use only)</td>
<td></td>
<td></td>
<td>CD Player</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptops (for classroom music use only)</td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synthesizers</td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section C  ICT in music education

12. Which of these do you consider to be ICT?

<table>
<thead>
<tr>
<th>Resource</th>
<th>Yes ICT</th>
<th>Not ICT</th>
<th>Resource</th>
<th>Yes ICT</th>
<th>Not ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Guitar</td>
<td></td>
<td></td>
<td>Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyboard</td>
<td></td>
<td></td>
<td>Laptop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Drum kit</td>
<td></td>
<td></td>
<td>DVD player</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD Player</td>
<td></td>
<td></td>
<td>Camea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cassette player</td>
<td></td>
<td></td>
<td>MP3 player</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television</td>
<td></td>
<td></td>
<td>Electronic reader</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td></td>
<td></td>
<td>Tablet e.g. iPad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White board</td>
<td></td>
<td></td>
<td>Smartphone &amp; mobile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smart board</td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projector</td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. Who buys the ICT for students at your school?

Students:
- Buy their own laptop or iPad
- Buy their own laptop or iPad through the school
- Use laptops or iPads owned by the school
- Have no access to laptops or iPads

14. ICT resources used in your music program, are:

- Only available in the school computer lab
- Only available in the school library
- Always available in your music classroom
- Brought to the music classroom by each class
- Does the music room own 0-15 iPads?
- Does the music room own 16-30 iPads?
- Does the music room own 0-15 laptops?
- Does the music room own 16-30 laptops?
- There is no access to ICT for the music program

15. Who provides technical support for ICT resources in your music program:

- ICT support staff
- Classroom music teacher (i.e. you)
- Librarian
- Other

16. How often do you use the following hardware in your music classroom?
For each question below, please mark one choice in part (A). If you answer ‘Never’ in part (A) then please mark one choice in part (B) to indicate the reason why.

<table>
<thead>
<tr>
<th>A</th>
<th>Frequency of use</th>
<th>B</th>
<th>If not used, Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in most lessons</td>
<td></td>
<td>Not available at all</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td></td>
<td>Not available when needed</td>
</tr>
<tr>
<td></td>
<td>never</td>
<td></td>
<td>Not familiar with</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lack of skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost of buying</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lack of ICT support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lack of time</td>
</tr>
<tr>
<td>PC (personal computer)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Laptop</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>CD player</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Cassette player</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Television</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Radio</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>DVD player</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Digital Camera</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Projector &amp; White Board</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>MP3 player</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>Tablet e.g. iPad</td>
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<td>2</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Smartphone &amp; mobile</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Other:</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

17. How often do you use the following software/services in your music classroom?

For each question below, please mark one choice in part (A). If you answer ‘Never’ in part (A) then please mark one choice in part (B) to indicate the reason why.
<table>
<thead>
<tr>
<th>A</th>
<th>Frequency of use</th>
<th>B</th>
<th>If not used, Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in most lessons</td>
<td></td>
<td>Not available at all</td>
</tr>
<tr>
<td>Educational websites</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Video streaming websites</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Subject-specific websites</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The internet for assessment &amp; quizzes</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Virtual Learning Environment (VLE)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Learning Management System (LMS)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Apps for tablets &amp; mobiles</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Generic software</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Assessment software</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Subject specific software</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Email</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Video conferencing</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Social networks</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Garage Band</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sibelius</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Finale</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>YouTube</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Facebook</td>
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<td>3</td>
</tr>
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<td>Websites</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Other internet/online resources</td>
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<td>3</td>
</tr>
<tr>
<td>Other software used:</td>
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<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

18. How do you use ICT in your music classroom?

Lesson planning
Creating and organizing your own digital resources
Whole class teaching activities
Individual learning activities
Collaborative learning activities
Assessment
Recording information about students
Monitoring and analysing student progress
Monitoring attendance and behaviour
Supporting students with special educational needs
Communicating with parents
Communicating with other teachers and students, music and video recording
Skills development
Composing
Other ways you use technology:

19. List some teaching pedagogies you have found to be most effective in using ICT in your music classroom:
   1.

   2.

   3.

20. What are the challenges or barriers to using ICT in you music program?

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>disagree</th>
<th>Neither agree or disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

227
Access to adequate ICT resources
Access to appropriate ICT resources
Funding for hardware
Access to music software
Funding for software
Music software not installed
ICT not working
Technical issues
You’re not sure how to fix it
Not enough time to fix it
Flat batteries
Chargers missing
Cords not available
Software issues
Internet connection problems
Computer errors
Power blackout
Managing students behaviour
Low confidence using ICT with class
Students easily distracted
Concern that your technology skills are do not match student’s skills.
Keeping up with new technologies
Managing access to irrelevant websites
Managing access to inappropriate material
Lack of ICT support
Lack of time to prepare
Access to school administration support
Not enough Professional Development
Other:

21. **How would you describe your level of ICT confidence in the following contexts?**

<table>
<thead>
<tr>
<th>Not confident at all</th>
<th>Low confidence</th>
<th>Neither confident or not confident</th>
<th>Confident</th>
<th>Very confident</th>
</tr>
</thead>
</table>

228
22. Do you feel your music education qualification included ICT training relevant to implementing ICT in the music classroom according to the Australian Curriculum?

<table>
<thead>
<tr>
<th></th>
<th>strongly disagree</th>
<th>disagree</th>
<th>Neither agree or disagree</th>
<th>agree</th>
<th>strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

23. What would give you more confidence using ICT in the music classroom?

Access to appropriate ICT resources to practise skills
Access to music software
Time
More professional development
Support to set up ICT
Support to maintain ICT
Support to help you use the ICT
Other
Section D  Professional Development

In this survey, professional development is defined as activities that develop an individual’s skills, knowledge, expertise and other characteristics as a teacher. Please only consider professional development you have taken after your initial teacher training/education.

24. In total, how many days of Professional Development relevant to implementing ICT in the music subject, did you attend during the last 18 months? Please round to whole days. Write 0 (zero) if none.

_______ Days  (If you answered ‘0’ (zero) please go to question 26).

25. Following the professional development, did you have appropriate ICT resources to practise ICT skills?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

26. In the last 18 months, did you want to participate in more professional development than you did?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

27. If “yes” in the previous question, which of the following reasons best explains what prevented you from participating in more professional development than you did? Please mark as many choices as appropriate:

Mark if appropriate

- I did not have the pre-requisites (qualifications, experience)
- Professional development was too expensive/I could not afford it
- There was a lack of employer support
- Professional development conflicted with my work schedule
- I didn’t have time because of family responsibilities
- There was no suitable professional development offered
- Other:

28. What professional development do you feel would be beneficial to classroom music teachers for implementing effective ICT in their music classroom?

THANK YOU FOR COMPLETING THIS SURVEY
Appendix L: Quantitative survey codebook

CODEBOOK (Creswell, p. 196)

Section A  Teacher Background Information

Question 1  (TALIS, 2013, p. 3)
comparison of gender confidence with ICT
What is your gender?
Gender – sex of the teacher; 1 = Male, 2 = Female

Question 2  (TALIS, 2013, p. 4)
comparison of confidence with ICT
How long have you been working as a teacher?

Question 3  (TALIS, 2013, p. 3)
Number of schools – funding for PD, ICT resources, time
Do you currently work as a classroom music teacher at more than one school?

Question 3  (TALIS, 2013, p. 3)
Number of schools – funding for PD, ICT resources, time
At how many schools do you currently work as a classroom music teacher?

Question 4  (TALIS, 2013, p. 4)
comparison of music qualifications
What is the highest formal music qualification you have completed?

Question 5  (TALIS, 2013, p. 4)
comparison of music experience and ICT relevant to curriculum
What is your music background? (tick more than one if applicable)

Section B  School Information

Question 6  (Elston, 2013, p. 51)
Compare distribution of resources-city/rural
ID – identification number assigned to each school, from 1 – 500
Where is your school located?

Question 7  (Elston, 2013, p. 51)
Compare distribution of resources-education providers
Who is the Educational Provider?

Question 8  (Elston, 2013, p. 53)
Compare resources-senior years have more ICT
What year levels are taught at your school?

Question 9  (Elston, 2013, p. 53)
Funding priority
Student enrollments – number of students attending the school;
1 = 1-500, 2 = 501-1000, 3 = 1001-1500, 4 = 1501-2000, 5 = more than 2001
How many students attend your school?
Question 10 (Elston, 2013, p. 41)
Managing ICT resources
Where are your classroom music lessons held?

Question 11
Funding/resource availability
What resources does your school provide the music classroom?

Section C

ICT in music education

Question 12
defining ICT
Which of these do you consider to be ICT?

Question 13
Funding/resource availability
Who buys the ICT for students at your school?

Question 14
funding/resources
ICT resources used in your music program, are:

Question 15
ICT support barrier
Who provides technical support for ICT resources in your music program:

Question 16
Elston, 2013, p. 16),
(Mwalongo, 2011, pp. 1-3)
Resources/pedagogy
How often do you use the following hardware in your music classroom?

Question 17
(Mwalongo, 2011, pp. 1-3)
Resources/pedagogy
How often do you use the following software/services in your music classroom?

Question 18
Elston, 2013, p. 31
Resources/pedagogy
How do you use ICT in your music classroom?

Question 19
Resources/pedagogy
List some teaching pedagogies you have found to be most effective in using ICT in your music classroom:

Question 20
Elston, 2013, pp. 40-41
Challenges/barriers
What are the challenges or barriers to using ICT in your music program?

Question 21
Elston, 2013, p. 13)
(Mwalongo, 2011, p. 4)
Teacher confidence
How would you describe your level of ICT confidence in the following contexts?

Question 22
Teacher confidence
Professional Development – relevant to ICT;
1 = 0-4, 2 = 5-9, 3 = 10-14, 4 = 15-19, 5 = more than 20
Do you feel your music education qualification included ICT training relevant to implementing ICT in the music classroom according to the Australian Curriculum?

**Question 23**  
(Elston, 2013, p. 14)

**Teacher confidence**  
What would give you more confidence using ICT in the music classroom?

**Section D**  
**Professional Development**

**Question 24**  
(TALIS, 2013, p. 6)

**PD**  
In total, how many days of professional development relevant to implementing ICT in the music subject, did you attend during the last 18 months?

**Question 25**  
(me)

**PD**  
Following the professional development, did you have appropriate ICT resources to practise ICT skills?

**Question 26**  
(TALIS, 2013, p. 8)

**PD**  
In the last 18 months, did you want to participate in more professional development than you did?

**Question 27**  
(TALIS, 2013, p. 8)

**PD**  
If “yes” in the previous question, which of the following reasons best explains what prevented you from participating in more professional development than you did?

**Question 28**  
(me)

**PD**  
What professional development do you feel would be beneficial to classroom music teachers for implementing effective ICT in their music classroom?
Appendix L: Qualitative semi-structured interview questions

Title: Teachers’ perspectives about implementing ICT in music education
GU ref no: 2016/783

Please note that the intention of the interview is to gain deeper understanding of issues raised by classroom music teachers. For this reason the interview questions are meant to be based on data collected from the survey.

Semi-structured Interview Questions
- What ICT resources do you currently have access to at your school?
- Are those resources owned by the music room?
- Who provides ICT support at your school?
- What practices may influence the implementation of ICT in the music education?
- Are there barriers in implementing ICT in your school?
- What helps you use ICT in your school?
- What does the term ICT in music education mean to you? Give examples of ICT in music.
- How do you currently incorporate ICT into your music program?
- How do you envisage ICT be implemented in music education to fulfill the curriculum?
- Is there a difference between your ideas and reality? Why?
- Do you feel confident using ICT in your music program?
- What Professional Development do you think would help you to incorporate ICT into your music program effectively?
## Appendix M: Qualitative transcript analysis

### Resources available in classroom music

<table>
<thead>
<tr>
<th>Resources available</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Samford SS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internet access</strong></td>
<td>WiFi, NBN</td>
<td>Use YouTube. Has more resources than I can buy with no budget</td>
<td>Music room upgraded for new arts curriculum got internet access Term 4 2017. Download from iTunes “Made a big difference”</td>
<td>Use internet based things</td>
</tr>
<tr>
<td><strong>Access to Computers</strong></td>
<td>One-to-one iPad program from Prep to grade 6. Years 1-6 children have their own devices and bring them here to class</td>
<td>Head of Arts Cath Ed visited and said to borrow iPads from the classrooms, get the kids to bring them but in reality the teachers refuse. I don’t have charging cords. It’s too much bother and not worth the hassle</td>
<td>Teach in Computer lab with computer and full 1 per student. -books the computer lab for the second lesson because there’s 2 teachers and 1 music room 2 days a week so “I don’t have a music room”</td>
<td></td>
</tr>
<tr>
<td><strong>Resources in room</strong></td>
<td>Interactive Whiteboard -One-to-one iPad program from Prep to Grade 6. “I’ve got everything, Orff traditional stuff in the cupboard and I alternate between traditional and technology”</td>
<td>Projector, screen with speakers</td>
<td>TV not interactive uses HTML plug. “Visual stimulus...exemplar...progress understanding and outcome is better”</td>
<td>Have an interactive whiteboard projector</td>
</tr>
<tr>
<td><strong>Laptop Tr</strong></td>
<td>School provides Tr laptop. Tr can choose either Mac or Windows. Tr chose Mac.</td>
<td>Tr had to buy own laptop</td>
<td>Department laptop for Tr only Kids would crowd around the laptop</td>
<td>Department laptop supplied to teachers who work 4 or more days</td>
</tr>
<tr>
<td><strong>iPads</strong></td>
<td>Tr bought her own iPad Pro.</td>
<td>Tr had to buy own iPad</td>
<td>-15 for class (pairs)</td>
<td>-Had to purchase own iPad</td>
</tr>
<tr>
<td><strong>Apple Mac</strong></td>
<td>iPads</td>
<td>iPads</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Apple TV</strong></td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AB Tutor</strong></td>
<td></td>
<td></td>
<td>Log students on and off, press freeze and you can show and stuff</td>
<td></td>
</tr>
<tr>
<td><strong>Coding Jam</strong></td>
<td>Kits where kids do coding to make music</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Makey Makey</strong></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Plickers</strong></td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Apps</strong></td>
<td>Showbie – Prep to Grade 3 hand in their assessment or we hand-out sheets, all</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

235
<table>
<thead>
<tr>
<th>Application</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showbie</td>
<td>Kids can physically draw on the page, aural skills exams through Showbie. For teachers we take home our iPad not a stack of papers.</td>
</tr>
<tr>
<td>Percussive Free</td>
<td>A xylophone app, plays glockenspiels on iPads. But it's funny because some kids just want to go back to real glockenspiels, a tangible instrument.</td>
</tr>
<tr>
<td>Book Creator</td>
<td>When I was on leave for 4 weeks all 4 weeks worth of lessons were on Book Creator. The kids worked their way through the booklets and they employed a non-music teacher.</td>
</tr>
<tr>
<td>Tune Train</td>
<td>Yes, until IOS update</td>
</tr>
<tr>
<td>MadPad</td>
<td>MadPad in grade 5, died in the new IOS update as well</td>
</tr>
<tr>
<td>AirDrop</td>
<td>Borrow someone's iPad then AirDrop it to yourself</td>
</tr>
<tr>
<td>Recording Studio + Big Mac computer</td>
<td></td>
</tr>
<tr>
<td>Keyboard</td>
<td>Yes</td>
</tr>
<tr>
<td>Guitar</td>
<td>14 keyboards</td>
</tr>
<tr>
<td>Audio boxes</td>
<td></td>
</tr>
<tr>
<td>PA system Guitar amps, base amp, clavinova, drum kit, piano, electronic drums</td>
<td></td>
</tr>
<tr>
<td>Microphones</td>
<td></td>
</tr>
<tr>
<td>USB kits</td>
<td></td>
</tr>
<tr>
<td>Screen</td>
<td></td>
</tr>
<tr>
<td>MuseScore</td>
<td>Just downloaded for grade 3 and up. It's like Sibelius but free. It saves for them</td>
</tr>
<tr>
<td>NoteFlight</td>
<td></td>
</tr>
<tr>
<td>Finale</td>
<td>Sibelius</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>Auralia</td>
<td>Musician</td>
</tr>
<tr>
<td>Quaver Music</td>
<td>Aural program</td>
</tr>
<tr>
<td>Nano</td>
<td></td>
</tr>
<tr>
<td>CD player</td>
<td></td>
</tr>
</tbody>
</table>

### Resources 7-10

<table>
<thead>
<tr>
<th>Resources 7-10</th>
<th>IE:7-10 (BGGS)</th>
<th>CE:7-10 (Mango Hill)</th>
<th>EQ:7-10 (Belinda)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYOD</td>
<td>- Students carry USB with them - students bring their own laptop to music class - Students realize, “there is only a very few percent...that don’t have Apple” - they all have Macs by the time we get to elective</td>
<td>- students bring their own laptop to music class - Everyone’s on Mac - Tr has Apple Mac</td>
<td>Students bring their laptops to music class - “Juniors just use the laptops” - handful have mac, most have PC</td>
</tr>
<tr>
<td>Internet</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Internet</td>
<td>Issue with Wi-Fi ...it’s great having all that equipment, the second that Wi-Fi is dropping in and out, kids can’t login to the computer. -It’s to do with the servers at the school and location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptop supplied to Tr</td>
<td>- Tr laptop supplied by school - they gave music staff a better computer with bigger memory size - Doesn’t have Garage Band - Does have Sibelius - Does have Noteflight</td>
<td>- Tr laptop supplied by school - Have Mac, but changing to Windows next year - “I’m fairly worried about that. I haven’t used Windows based recording software in the last 10 years...the integration we have now is seamless”</td>
<td>- Tr laptop supplied by school</td>
</tr>
<tr>
<td>Apple Mac</td>
<td>- 3-7 computers in each music room. Up to 16 between music</td>
<td>- Transitioning going back to Windows to a MacBook</td>
<td>- 14 in each classroom</td>
</tr>
</tbody>
</table>

237
<table>
<thead>
<tr>
<th>Rooms for students without Apple, have to complete work in own time on school Mac. All students use laptops, there are No iPads</th>
<th>Laptop/tablet/touch screen. Decision based on cost, durability, “Apple no longer offers an 11 inch laptop...13 inch is beyond... a reasonable parent contribution”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording Studio + Big Mac computer</td>
<td>Recording studio used by seniors -used by seniors -“we just plug in and go”</td>
</tr>
<tr>
<td>Keyboard</td>
<td>16 in music classroom -14 in music classroom (1:2) -Link to Audio Boxes -Keyboard lab “in each classroom with USB cables -“plug into the Macs and kids record”</td>
</tr>
<tr>
<td>Audio boxes</td>
<td>-Presonance Audio Boxes (ie 2 channel USB unit) -Avid 2 tonal USB units -plug in and record guitars and vocals</td>
</tr>
<tr>
<td>PA system Guitar amps, base amp, clavinova, drum kit, piano, electronic drums</td>
<td>2 PA system’s in the classroom (1 for small band: vocalist&amp; 1 for band area)</td>
</tr>
<tr>
<td>Microphones</td>
<td>Link to Audio Boxes</td>
</tr>
<tr>
<td>USB kits</td>
<td>-Have 8 (aiming for 14 for 1:2 ratio) -“A half class set of interfaces...in a little kit with leads, a mic and a stand”</td>
</tr>
<tr>
<td>Screen</td>
<td>Connects to tr’s computer and audio Digital whiteboard has a digital pen but is not interactive -Apple TV - Connects to Mac laptop -connected to “fairly decent speaker set” Interactive whiteboard but “I’ve never used it”</td>
</tr>
<tr>
<td>NoteFlight</td>
<td>-Year 7 -free downloadable music software program -notation -safest -Years 7,8,9 -online -Access with Macs -Years 7, 8, 9 -Free downloadable -on BYOD laptops -used for composition</td>
</tr>
<tr>
<td>Finale</td>
<td>-Years 7, 8, 9 -on BYOD laptops -used for composition</td>
</tr>
<tr>
<td>Sibelius</td>
<td>-Year 8-10 -students purchase Sibelius First $100 (student version) -notation -composing -safest -On Macs -Used for notation -Sibelius</td>
</tr>
</tbody>
</table>
| **Garage Band** | **Year 8-10**  
use “a lot now for recording”  
-compose  
-record  
-focus on practical  
-safest | **-Apple Macs to access Garage Band** | **-On Macs**  
-used for recording  
-Garage Band |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auralia</strong></td>
<td><strong>-Aural test and aural exercises</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Musician</strong></td>
<td><strong>-Theory exercises</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Online games</strong></td>
<td><strong>-Lesson fillers</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **MuseScore** | | **-Access with Macs**  
-Years 10,11,12  
-more flexibility than NoteFlight | |

**ICT support**

| **ICT SUPPORT** | **IE (Belinda Dolan-Lutheran)**  
-Have 2 IT guys, one specializes in iPads and one specializes in HP. Both work at the school full time.  
-Teachers are on PC but all the kids are all on Mac (iPads). | **CE (Anne)**  
-One ICT staff member comes 1 day a week | **EQ (Leah-Stafford Heights)**  
-There’s an external man. Used once to setup laptop. Person changes a lot. Not here every day. Only here one day that I’m here. | **EQ (Samford SS)**  
-“iPads are charged overnight before I get them”  
-Librarian in charge of software on iPads (Garage Band)  
-ICT support man 3 days a fortnight but he look at the computers, he’s not an iPad fan. Does staff computers & computer lab |
| **ICT Staff** | | | | |
| **Laptop supplied to Tr** | **School provides Tr laptop. Tr can choose either Mac or Windows. Tr chose Mac** | **Tr had to supply own laptop and iPad** | **Department laptop for Tr only** | **Department laptop for teachers working 4 or more days a week** |
| **Procedures** | **Lodge a request form (ERM form) on TASS.**  
-“If you want an App then we have an ICT coordinator and you have to go through him and it has to be rated and if it’s over (MadPad was 13+) you have to write a letter to parents” justifying using the App, parents have to sign a permission form. | **Put job requests/problems on the school portal** | **Log book** | |
the iPad for a week though.

Other help

| Deputy Principal | is pretty good, some other staff members | Husband |

Budget Purchasing ICT resources

| Parents pay a levy/school fees to cover the book list at the start of the year. Anything else comes out of the music budget. We get an educational discount for buying bulk. | No budget | No Music Budget. 14 keyboards donated through the gaming fund. A parent applied for that. Applied to P&C for guitars. No ongoing fund. Won’t ask for resources because principal priority is to raise Naplan. |

Licences come out of music budget.
-Had to pay to use Garage Band licences
-trying to get money from P&C towards getting a half class set of iPads for the music room but they’re against that because of upkeep and equity to other classes.
-try to fund raise the money so don’t have to rely on the computer lab.

I asked the ICT support man to put Garage Band and on the iPads and he can’t, because those children own their own iPads and so all the children have to put Garage Band on themselves. He couldn’t suggest any software for laptops for grades 4-6.

Free Garage Band had to be wiped then reinstalled after paying the licence fees.

Licencing software issues

| New IOS update stopped certain Tune Train from working “and we just bought them, that’s’ $600 for the whole school” | I asked the ICT support man to put Garage Band and on the iPads and he can’t, because those children own their own iPads and so all the children have to put Garage Band on themselves. He couldn’t suggest any software for laptops for grades 4-6 |

Wi-Fi

| Concrete room underground WiFi didn’t work so Music got its own WiFi. Works well. |

ICT SUPPORT 7-10

| IE:7-10 (BGGS) | CE:7-10 (Mango Hill) | EQ:7-10 (Belinda) |

ICT Staff

- full-time staff
- arrange an in-service.

-School has a partnership with a company called Next Bite
- IT person does the maintenance on site
- another contractor who does maintenance from a company called Format
- 2 school staff for a school of 500 plus subcontractors who come in and maintain laptops and infrastructure
- Funded by the school, supported by parents paying for

“Some men who are ICT techs”
<table>
<thead>
<tr>
<th>ICT issues during class</th>
<th>laptop and school infrastructure, insurance and maintenance on machines</th>
<th><em>Tr manages ‘user errors’ during class</em>&lt;br&gt;<em>-gets kids to work together</em>&lt;br&gt;<em>-I teach them what the problem is and how to fix it…then some of them are really savvy…I’ve got a whole little team of ICT techs in the room who can fix computer issues</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>-in the immediate moment, I can send an email and say I’m struggling…and they might come straight away, they might not.</td>
<td>“if things go wrong or don’t work, you more or less fix it yourself”</td>
<td></td>
</tr>
<tr>
<td>Procedures</td>
<td>Maintenance portal&lt;br&gt;-“log it and wait for it to be fixed”</td>
<td><em>-issues around maintaining the equipment and programs on the computers</em>&lt;br&gt;<em>-only 3 or 4 would work in the caddy</em></td>
</tr>
<tr>
<td>-“afterwards I could say I’ve had trouble with this and they’ll say, either send the girl to us and we’ll sort it out. Or they do try to fix it”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT support for students</td>
<td>Maintenance for students provided by ICT staff&lt;br&gt;-had to ask for years to get macs”&lt;br&gt;-got permission to buy the macs&lt;br&gt;-purchased Sibelius&lt;br&gt;-use Musician&lt;br&gt;-took years to get laptops. Had to fill in an EAI to request a lot of money, how it will benefit students&lt;br&gt;-Students charged a music levy – used for maintaining laptops and replenish laptops&lt;br&gt;--Took 12 months to get licensing for Musician</td>
<td>Maintenance for students provided by ICT staff</td>
</tr>
<tr>
<td>Budget Purchasing ICT resources</td>
<td>“in this school if you mention the word technology you are supported, particularly the arts, they want it to be practical, engaging”&lt;br&gt;--submit a budget submission linked to curriculum 2017 $15000&lt;br&gt;-“The biggest issue I have, is that I have none, I have no iPads here in the classroom. -The kids have devices in the classroom, they could bring them here but music swaps with PE the teachers are pretty reluctant to let the kids bring ICT to music.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Not really for [music]”.&lt;br&gt;“I don’t like to ask…iPad to be used for reading and learning program”&lt;br&gt;-“If I was in Clayfield College and I had the resources, money and everything then I would definitely use it”</td>
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<tr>
<td>School practises that hinder you from implementing ICT in your music room</td>
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<tr>
<td>Problems that hinder v’s Help P-6</td>
<td>IE:P-6 (Belinda Dolan-Lutheran)</td>
<td>CE:P-6 (Anne)</td>
</tr>
<tr>
<td>Resources</td>
<td>-“Everyday have -Kids having their own devices makes it easy</td>
<td>“The biggest issue I have, is that I have none, I have no iPads here in the classroom. -The kids have devices in the classroom, they could bring them here but music swaps with PE the teachers are pretty reluctant to let the kids bring ICT to music.</td>
</tr>
<tr>
<td>iPads v' computer lab</td>
<td>No access</td>
<td>- Borrow out from office, but in high demand, <strong>so don't get access</strong>. New principal - priority access to classrooms</td>
</tr>
<tr>
<td>Time</td>
<td>I don’t get morning tea’s and lunch times, I have duty, choir, instrumental lessons.</td>
<td>40-50 minute lessons cut to <strong>30 minutes</strong>. Have to teach all arts subjects No release time</td>
</tr>
<tr>
<td>Software</td>
<td>New iOS update stopped certain Tune Train from working “and we just bought them, that’s’ $600 for the whole school” - MadPad cost $1000 and stopped in the iOS update too. Asked not to update until the end of the year, some did but some didn’t.</td>
<td>ICT support wouldn’t put Garage Band on iPads. No software for laptops</td>
</tr>
<tr>
<td>Saving iPad work: Good Reader, Google Classroom</td>
<td>Everything is done on their iPads and uploaded to Google Classroom - it’s saved onto their own device it’s all there when they go to class, they upload to Google Classroom or Google Drive to backup all of their work.</td>
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</tr>
</tbody>
</table>
| Student engagement | - Create routines to minimize the risk of inappropriate behaviour. - Students have full access | Chn switched off about computers. “we don’t really want to work anymore with computers, we just want to | - Relying on kids to log in. I log in from my computer and log everyone in, I can lock computers if they’re
<table>
<thead>
<tr>
<th>Internet</th>
<th>Got struck by lightning and had no ICT at all, no internet, no telephones, no printing. -“Internet used to cut out often but we changed to NBN, then we had a massive amount of issues with NBN but that was all ironed out”. -The music classroom is in solid concrete the WiFi doesn’t work in here but since I’ve had my own WiFi no problem.</th>
<th>Drops out. Especially when relying on websites. -Looking into my login and everything’s freezing, we’re not getting half an hours work done. I’ve had to dumb down the tasks to get it finished -it can take grade 2 a whole class just to log in, so it’s good to have the system where I log everyone on and off.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>One-to-one iPad program from Prep to grade 6. -1-6 bring iPads to class</td>
<td>Computer lab, book room, can’t log on, computers not working. -just want to do a 10 minute activity on ICT but can’t do that in lab</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problems that hinder v’s Help 7-10</th>
<th>IE:7-10 (BGGS)</th>
<th>CE:7-10 (Mango Hill)</th>
<th>EQ:7-10 (Belinda)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>“When I can’t get the sound to work and I need to play a song…so they can hear straight away. Sometimes I can get away with problems eg with melody writing, can quickly play it on piano</td>
<td>-Apple TV’s drop out when someone accidentally clicks on yours and kicks you off -the number of resources has definitely contributed…”we have gone from strength to strength</td>
<td>“Frustrating when I didn’t have computer. When I did have computers they didn’t work…all the issues…just took up so much lesson time…how to use what did work with the kids”. “Where as, these days it’s fantastic…I’ve got the equipment that I want…it seems pretty seamless most of the time” apart from the user errors or the Wi-Fi not kicking in.</td>
</tr>
<tr>
<td>Time</td>
<td>Pushed timewise to deliver the program to get through</td>
<td>-teacher manages gear, puts it together and resourcing – no</td>
<td></td>
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</tbody>
</table>

to YouTube, not a lot blocked. -Kids keep their iPads over to the side against the wall, then sit in the square on floor, get iPads for the activity, then go back to the wall to stop wandering fingers. learn guitars and practical” mucking around, I can log everyone out, that saves time
<table>
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<tr>
<th>developing the musicianship to develop the composing skills...composing, musicology and performing/ it’s just so hard -Lessons are “always interrupted with withdrawals, we never get that full time which is frustrating.</th>
<th>help setting up kits and work stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doesn’t make sense (communication)</td>
<td>-Tr supplied laptop is Windows but music department uses Mac so tr laptops don’t have Garage Band -Tr’s given Windows laptops but want Macs. Macs are necessary in music rooms -Currently have Macs but changing to Windows next year. -“I’m fairly worried about that. I haven’t used Windows based recording software in the last 10 years...the integration we have now is seamless”</td>
</tr>
<tr>
<td>Software</td>
<td>NoteFlight with the composite composing. Sibelius is great. Garage Band. The three safest. -Currently an issue my account was not set up properly...all I can do is pull up the file and show the students. I can tell them what to do but I can’t show them. -you have to shelve your lesson or do something different or cannot give them the same level of understanding. -“Frustrating”</td>
</tr>
<tr>
<td>Online Theory</td>
<td>AMEB Theory Website makes mistakes</td>
</tr>
<tr>
<td>Student skills</td>
<td>-student skill level on their instrument to be able to record -Student proficiency on a keyboard or bass guitar good enough to polish and record, -using a click track</td>
</tr>
<tr>
<td>Student engagement</td>
<td>-integrating music technology and now there’s more direction and a greater level of engagement and success -Students are quite engaged -little routines for classes, seating plan, tech savvy kids helping</td>
</tr>
</tbody>
</table>

**School practises that help with the implementation of ICT in the music room**

<p>| ICT schemes | IE (Belinda Dolan) | CE (Anne) | EQ (Leah-Stafford) | EQ (Bridget Samford SS) |</p>
<table>
<thead>
<tr>
<th>P-6 Lutheran (Heights)</th>
<th>Helps ICT implementation</th>
<th>One-to-one iPad program from Prep to grade 6</th>
<th>BYOD years 1-6, Prep school owns devices doesn’t help music though</th>
<th>Not an own device school.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT schemes 7-10</td>
<td>IE:7-10 (BGGS)</td>
<td>CE:7-10 (Mango Hill)</td>
<td>EQ:7-10 (Belinda)</td>
<td>Helps ICT implementation</td>
</tr>
<tr>
<td>BYOD. Students buy their own device</td>
<td>“Devices are purchased by the school and the parents pay them off over 3 years and that includes maintenance and insurance. At the end of 3 years they enter the cycle again”</td>
<td>Students have own device</td>
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</tbody>
</table>

**Defining the term ICT in the context of music**

<table>
<thead>
<tr>
<th>Define ICT</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Bridget Samford SS)</th>
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<tbody>
<tr>
<td>Definition</td>
<td>“Anything that helps learning that’s maybe current, keyboard rather than piano, CD’s, computers, I think. Technology is ICT. Anything to do with technology”. “We teach technology but the tool is ICT. I don’t know if it’s right”</td>
<td>“I think of it as computers, anything that can be plugged into a computer or laptop. Thinks on its own almost. ICT is different to technology because” technology can be something that’s new for its time like a pencil”. ICT can be technology as well but ICT you can program and it can control other devices</td>
<td>Anything that connects to the internet</td>
<td>“Not pencil and paper its using those technologies like notation software and games and websites to enhance what we’re doing in the classroom to extend their learning” -yes traditional instruments, in a broad definition a lot of things can be ICT I guess -“when I think ICT I don’t straight away think of like playing the instruments, maybe playing them into a software to help record it yes, but not actually just playing” -electronic keyboards, I’m not sure if that’s’ considered ICT</td>
</tr>
<tr>
<td>Examples</td>
<td>Blue cord, what has downloaded from the internet, iPad, screen, software, hardware, Not keyboards.</td>
<td>Software, App, internet websites, computer based programs.</td>
<td>“A computer is kind of a vessel for ICT really”</td>
<td>245</td>
</tr>
</tbody>
</table>
"I was going to ask you to clarify for me...Interactive, computer training, no”

-"I assumed it was anything technology from programs that I use to streamed sound"

-"In my own mind I had separated it from music instruments"

-a lack of knowing

-"It’s a bank of resources that can be used in an education context"

-"I don’t really consider all of that music equipment as ICT”

-"I just seem to have a bit of a divide for myself between performance gear and computer gear for some reason”

-Laptop, overhead projector, music technology like a digital platform for storing, interface that records

-Laptop, software programs, data projectors, digital mixing desk. You can hook up music equipment to the computer

Wish list and requests for ICT music resources

<table>
<thead>
<tr>
<th>Wish List</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Bridget Samford SS)</th>
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<tr>
<td>Budget</td>
<td>Recently requested resources and “Principal flat told me there was no money for that“ -I had to pay for the choir entry in the competition -A lot of money being spent on literacy, the curriculum leader has been given 3 days off a week to do literacy and pay a replacement to teach her class.</td>
<td>&quot;No...because I see the stress that everybody’s under”. Principal removing “everything out of the classroom except mainstream curriculum” Next year has to teach all arts curriculum areas.</td>
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</tbody>
</table>
| "I’m pretty lucky, this | I’d love the iPads | "Half class of iPads, 15 or
school is ahead of its time, so I really can’t argue”
-“I just hope that we haven’t put a lot of this money in and technology moves so fast...we get left behind because of the next big thing that gets invented”
-“My wish would be that we continue to stay current with current trends”

“When anything breaks I replace it, so it would be good to have a budget just for things like that”

Time with Master Teacher

<table>
<thead>
<tr>
<th>Wish List 7-10</th>
<th>IE:7-10 (BGGS)</th>
<th>CE:7-10 (Mango Hill)</th>
<th>EQ:7-10 (Belinda)</th>
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</thead>
</table>
| Budget         | - I don’t feel like there is anything lacking in the classroom”
                 | - we buy the most durable and most user friendly
                 | - so the gear is always functioning, that’s a big help
                 | - new school so it loans the money
                 | - submit a budget submission linked to curriculum 2017
                 | - “I’ve never been knocked back on anything that I’ve wanted”
                 | - took years to get laptops. Had to fill in an EAI to request a lot of money, how it will benefit students
                 | - Students charged a music levy – used for maintaining laptops and replenish laptops
|                |                | 2018 - asked for 7 recording interfaces, 14 microphones, leads to go with each, plus hard cases
|                |                | Upgrade the recording studio |

**Examples of incorporating ICT in the music program**

<table>
<thead>
<tr>
<th>Activities</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Bridget Samford SS)</th>
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<tbody>
<tr>
<td>OneNote</td>
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<td>Class</td>
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<tr>
<td>Note Book</td>
<td>Methodologies</td>
<td>AMEB Theory</td>
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<tr>
<td><strong>Activities</strong>&lt;br&gt; All assessment is paperless. <em>Everything is done on their iPads and uploaded to Google Classroom.</em>&lt;br&gt;- Digital Feed Forward: kids record themselves, upload it, Tr speaks over the top of it, kid improve and re-record to get a higher mark&lt;br&gt;- lower primary composition using Makey Makey, Plickers.com as formative assessment&lt;br&gt;- App Smash. I’ll write an Aural Skill book or a handout sheet. Kodaly based school so we’ll sing a song, tap beat, rhythm, using SAMR find out Rhythm.&lt;br&gt;- Book Creator then upload it onto Showbie (repository similar to Google Classroom where kid can write on sheet, press done and immediately saves it back in their work).&lt;br&gt;- “Kodaly pentatonic scale and tri-chords, get the kids to record themselves and upload it, then using digital feedforward kids can improve marks“.&lt;br&gt;- Sing and record a</td>
<td>I only have a projector and a screen and laptop. I use those an awful lot for whole class. I know they’ll work and I don’t have any major issue with those not working, no one to help me get it to work.&lt;br&gt;- doesn’t help with hands-on&lt;br&gt;- model things for whole class</td>
<td>View CTC resources of other kids doing composition&lt;br&gt;- project the 30 second animation they are scoring onto TV.&lt;br&gt;- students set up in front of movie with sound, record with iPad&lt;br&gt;- record sounds on keyboard or percussion, create feedback loop&lt;br&gt;- create feedback loops on iPad</td>
<td>2 lessons a week: 1st lesson- “Kodaly based singing and clapping, theory. whole 2nd lesson- working mainly on compositions on the computer&lt;br&gt;- “Name rap: they rap about their name, what they like to do, they play a drum beat, they learnt about fast and slow, simple &amp; complex rhythms, then put it all together”</td>
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</table>
canon
ebook: “We create the books in BookCreator”.
The kids did an aural skills exam so I put the criteria, Rhythm dictation questions, melodic dictation, chords. Then share it. Export as a PDF. Single pages can drop into Showbie into a folder. Each child can see only their folder, tr marks it, locks it so kids can view it
-I do a lot of PBL’s and STEAM
-chn work through ebooks
-technology time – 5-10mins. It might be playing Creddy Box and doing composing, or using Garage Band making a sound scape, using MadPad for sound compositions and sound scapes.

<table>
<thead>
<tr>
<th>e-learning website</th>
<th>Look at choir singing on the TV</th>
</tr>
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<tbody>
<tr>
<td>Recording</td>
<td>Record own acoustic accompaniments, use USB into computer</td>
</tr>
<tr>
<td>iTunes</td>
<td>Download iTunes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activities 7-10</th>
<th>IE:7-10 (BGGS)</th>
<th>CE:7-10 (Mango Hill)</th>
<th>EQ:7-10 (Belinda)</th>
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<tbody>
<tr>
<td>OneNote</td>
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<td>OneNote – Tr and students have OneNote.</td>
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<td>-Tr puts a lesson’s content, directions and activities onto a page</td>
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<tr>
<td>Class Note Book</td>
<td>Tr distributes the OneNote lesson to students via Class NoteBook. Students send their work to Tr and Tr sends feedback Collaboration page for brainstorming</td>
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<tr>
<td>Methodologies</td>
<td>Kodaly – No Orff - No</td>
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<tr>
<td>AMEB Theory</td>
<td>Online AMEB Theory: Yr 7 - grade 1 theory Yr 8 - grade 2 theory Yr 9 - grade 3 theory Do test at end of year.</td>
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<tr>
<td>Activities</td>
<td>Give instruction to whole class, point out anything musically, then they’ll go to their own computer and work on skills with headphones. They get immediate feedback, good for those with low musicianship skills (low sight singing capabilities). Do concept of composing immediately put into NoteFlight or Sibelius. “That’s the great thing about that immediacy...it’s equalizing”. Students learn 3 skills then give them a piece they have to input, use skills in melody and chord writing. Polish performance for recording on keyboard or bass guitar. Work to click track -students need a substantial amount of teaching, listening skills and playing skills -need to be able to play piece proficiently, so when they’re using the recording gear it’s the only challenge, for greater success -students not classically trained, lean towards production roles, cutting up and creating own music -as the school get bigger and we have a bigger instrumental program it may shift to more traditional music education...”but not if I have anything to do with it” -Year 7 learn Dinah sing, clap, solfa, play on keyboard or guitar, integrate music technology, score it on NoteFlight, add tonic dominant baseline, play drum kit, write drum part, export into Garage Band, and drum part on midi keyboard</td>
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<tr>
<td></td>
<td>Composition</td>
<td></td>
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<tr>
<td>Hands-on activities 7-10</td>
<td>IE:7-10 (BGGS)</td>
<td>CE:7-10 (Mango Hill)</td>
<td>EQ:7-10 (Belinda)</td>
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<td>Laptop, Band</td>
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<td></td>
<td>-Year 7 learn Dinah sing, clap, solfa, play on keyboard or guitar, integrate music technology, score it on NoteFlight, add tonic dominant baseline, play drum kit, write drum part, export into Garage Band, and drum part on midi keyboard and create loops.</td>
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</table>
## Teacher confidence regarding ICT

<table>
<thead>
<tr>
<th>Confident</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Bridget Samford SS)</th>
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<tbody>
<tr>
<td><strong>Concerns</strong></td>
<td>Not very confident. I can show the kids what to do but happy to let them discover and teach each other</td>
<td>-Have to keep up -Seen Tr contracts not renewed because unable to learn how to use the reporting system. “It’s probably my attitude that the biggest problem”</td>
<td>-Feel confident -relies on getting help, making sure everything’s on, “I’ve educated myself, self-driven, I’ve not really grown up with it, I understand the Apps, what the computer programs do, I can try and problem solve a bit. Not when it doesn’t work, I know how to use the software but not installing Apps</td>
<td></td>
</tr>
<tr>
<td><strong>Self-evaluation of confidence</strong></td>
<td>“I’m pretty switched on myself. I’m actually a technology mentor for MusicEdNet.”</td>
<td>Not over-confident, know what to do with word and powerpoint.</td>
<td>Have to produce backing tracks, download things, Nano and connect to other devices. Recording. Keeping on top of it, changes so fast</td>
<td></td>
</tr>
<tr>
<td><strong>PD Sources</strong></td>
<td>-“I want to be part of that ground breaking stuff” (iPads) -‘You make me so electric’ Neil Johnston, sent videos how to use the iPad, via Distance Ed. I would learn it on Sunday and teach it on Monday. I bought myself an iPad with salary sacrifice and taught myself -As I found problems I would google it. -Travelled around Australia giving lectures on Music</td>
<td>Husband Internet Experience, develop a knowledge and understanding Home computer</td>
<td>Garage Band trial and error -Midnight Music Katie Wardrobe -YouTube stuff or websites -own initiative</td>
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</tbody>
</table>
Technology. Found that people are afraid of technology & iPads - “If I break it, just reset it, and it’ll be ok”

**Experience**  
I ask the kids and they step into that teacher role  
I don’t have a smartphone  
Graduated in 2010, 7th year teaching

**iPads**  
- Practice before I get into class. If I forget then kids will help.  
“Yes, I won’t bring it into class. If I’ve had a really good go at it...not the place to experiment with our students”.  
“Behaviour management is a really big issue so you just don’t come into the classroom unless you know exactly how the task is going to end”

**ICT in Uni**  
none  
“No ICT subject...but did my ICT Certificate” a little course online

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<tr>
<th>Confident 7-10</th>
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<th>EQ:7-10 (Belinda)</th>
</tr>
</thead>
</table>
| Self-evaluation of confidence | “I know...Sibelius...but if anything goes wrong with the basic function of the computer and why its denying access or why its frozen or crashed or I can’t get sound, of ten that because some students have come in and pulled out some plugs and rearranged something”  
-“Yes definitely with most of the programs. NoteFlight is new “would like some more”. I like to make sure the sound always works.  
-confident with things used a lot | “Only through experience because most things have gone wrong and you’ve learnt how to deal with them”  
-uptime (online time) is high, “rare that our internet goes down”  
-“school system fairly fool proof”  
-“essentially because of my background in music technology” | “To an extent. There’s a lot I don’t know”  
Don’t know a lot about recording, Garage Band  
-Learnt by guessing and teaching myself |
| PD Sources | “I’ve asked the sound guy to give me an in-service in each of the rooms so when things | “I’ve been playing with these things for a long time so I know pretty well” | YouTube tutorials, Google stuff |
go wrong I can know a little bit more”
-colleagues share the information, ask more questions, collegial training, using a spare lesson to fiddle around with it, have a list of directions to “help me get through delivering that demonstration “
-online training, videos -self orientated, in own time

-YouTube, Forums, Reether .“I’ve learnt these skills via trial and error”

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<thead>
<tr>
<th>Experience</th>
<th>Started teaching 2010</th>
<th>Started teaching 2013</th>
<th>Started teaching 2006</th>
</tr>
</thead>
</table>
| ICT in Uni | No “I was totally and inadequately prepared”  
“I found it unengaging and boring, I couldn’t see the relevance...it was of no value”  
“putting kids in front of the computer because you don’t actually know how to teach them some musical skills and how to play things themselves” | No, very little in my actual course  
Always interested in live sound, learning was self-directed. I’m still learning a lot |  |

**Professional Development**

<table>
<thead>
<tr>
<th>PD</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Bridget Samford SS)</th>
</tr>
</thead>
</table>
| Haven’t attended PD. I love blogs and belong to 500 Facebook pages of elementary music teachers. I teach technology, STEM education and STEAM education  
-Amy Burns on Facebook  
-TeachersPayTeachers also have blogs  
-I did a MOOC through Sydney Uni with James Humberstone  
-I learnt to make a blog | “I don’t know that PD would help me. I can do all the PD in the world but when I walk back in front of the class all I can do is tell them about it, which isn’t hands on, because we have no iPads, we have no laptops”.  
-“I think we need resources before PD can even have any effect and of course time to practise” | Crescendo | Midnight Music  
-aimed at teachers, simple things you can do right up to more complex things from Prep to grade 12.  
-Mainly online things, self-paced learning  
-having access to stuff that’s already online  
-In my own time (no time through school) |
What PD do people want?

| Hands on stuff they can take an activity away that they can adapt into their classroom. They want you to show them what it is and let them play with it.
- “A lot of primary teachers are 40-60 and feel quite unskilled. A few millennials show up because they’re already on their iPad and iPhone.” |

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<tr>
<th>PD 7-10</th>
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<th>CE:7-10 (Mango Hill)</th>
<th>EQ:7-10 (Belinda)</th>
</tr>
</thead>
</table>
| - online training, videos
- I think the school is happy to send me to PD. I haven’t put in a request for the ICT
- they’ve agreed to me doing Kodaly summer school in the past
- Noteflight
- knowing how to connect Garage Band and electronic instruments
| Online PD - Katie Wardrobe and Kate Hargraves float around music tech and do PD online
- short course at TAFE
- online Forums
- depends on what school is willing to fund
| “There’s not a lot that I can go to that would specifically train the stuff I need” |

**Australian Curriculum**

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<tr>
<th>Australian Curriculum</th>
<th>IE (Belinda Dolan-Lutheran)</th>
<th>CE (Anne)</th>
<th>EQ (Leah-Stafford Heights)</th>
<th>EQ (Bridget Samford SS)</th>
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<tbody>
<tr>
<td>CTC</td>
<td></td>
<td></td>
<td>Look more deeply in CTC. Frustrating have to find where everything is hiding -(HUGE focus on C2C) “Think like it wants me to think”</td>
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<td>Arts amalgamation</td>
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<td>“We’ve been changed, we are no longer music teachers, we’re arts”</td>
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<td>Internet resources</td>
<td>“Asking us to access resources using the internet”</td>
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<td>Other</td>
<td>“Taught at the University of Sunshine Coast early years arts specialty was integration of ICT”. It means having children digitally literate, kids exposed to ICT with an interactive whiteboard, composing, recording sounds, making soundscapes. Anything can enhance what they’re doing within the curriculum”. “I belong to the Kodaly music society KMEIA QLD, Kodaly teachers are very reluctant to use ICT, I think you’re not doing the AC”. “I think the AC expects that we will give children opportunities for hands-on activities with ICT”. It’s not possible because I don’t have resources, haven’t got time to beg, borrow and take iPads and chargers and install software, dealing with teachers. It’s great on paper but the practical side of it is that I’m dealing with people who don’t want to help. Asking 3 elements: compose, respond, perform.</td>
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<td>-Putting ICT in AC- Left to my own devices, if there were issues then they’re more than happy to help -Principal support</td>
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<td>“I haven’t looked very much at the Australian Curriculum in ICT or in music”. “When I look into the AC haven’t focussed on technology, but composition, performance.”</td>
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"I’m going to be asked to teach in four areas that I have no competency in and no training" -long-service leave to plan for arts curriculum
<table>
<thead>
<tr>
<th>Australian Curriculum 7-10</th>
<th>IE:7-10 (BGGS)</th>
<th>CE:7-10 (Mango Hill)</th>
<th>EQ:7-10 (Belinda)</th>
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<td></td>
<td>-Don’t know if I really know what the AC is asking.</td>
<td>-I just look at the skills...being asked to utilize at a year level, “and in terms of the ICT I basically do my own thing”</td>
<td>“Embed it in what I do in music in my school context”</td>
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<td></td>
<td>-just “provide a program that’s widely accessible, variety of experiences including ...electronic music, interact physically...with software programs that enhance our hearing, learning and composition”</td>
<td>-interpret the skills that they want them to learn and then determine how I can do that in a more traditional sense and then how I can use ICT to make it more real. Kids don’t enjoy...singing back folk songs to you for a term...our kids want to be hands on. “I find developmentally it...a step up from essential learnings</td>
<td>-“Work with what you’ve got”</td>
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<td>-self educating, inquisitive</td>
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**Ideas verses reality**

<table>
<thead>
<tr>
<th>Ideas vs reality P-6</th>
<th>IE (Belinda Dolan-Lutheran)</th>
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<th>EQ (Bridget Samford SS)</th>
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<td></td>
<td>“I’d love to do a lot of stuff with ICT in the classroom but the reality is we have no resources, no time, no-one for help, I’m doing it on my own. The money is going to the HOD to write literacy policies and I’m trying to teach a curriculum without resources. The reality is very different to my ideas. His attitude affects the teachers so they keep the iPads in the classroom for Maths and Literacy and music is a fringe subject. The classrooms are the priority and music misses out”</td>
<td>Get a smartphone for recording samples. Learn Sibelius.</td>
<td>-go back to iPads Garage Band. -Make ring tones on iPads -Put music to a movie scene</td>
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This school is low ACS and other school Middle ACS: I teach same curriculum. I want better focus from these students, other school has greater readiness so I can take them further

Get the iPads back
Permission to use phones in class

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<td>Innovative ideas but don’t have the support...“We’ve learnt to just drop it”</td>
<td>“what I want to do and what I will be able to do may not line up because of the nature that senior education is going to change” -I’d like 7-10 to be more project based</td>
<td>“Now I’m at a point where my reality is what I teach...I’ve got what (resources) I’ve got now, but that was hard to get”</td>
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