



# Australian music teachers' reflections and concerns during the pandemic: Resetting the use of technologies in 21<sup>st</sup> century classroom practice

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## ABSTRACT

*Classroom practice around the globe has changed considerably due to the global pandemic. Although ICT (information and communication technology) is at the heart of 21<sup>st</sup> century teaching and learning, many teachers and students had to make significant adjustments shifting from face-to-face to remote (online) delivery in response to lockdowns and government restrictions since March 2020. This paper focuses on one focal question: 'What were some of the concerns using ICT during Covid-19 pandemic?' which was part of a wider Australian study 'Re-imagining the future: music teaching and learning, and ICT in blended environments in Australia'. The authors seek to understand how music teachers look to employ technology in ways that connect teaching frameworks to 21<sup>st</sup> century classroom practice. As part of the ongoing study, they present preliminary survey data gathered between March–June 2021 from a range of music teachers around the country. Using thematic analysis, they discuss advantages, disadvantages, opportunities, and challenges in relation to responses that thematically relate three key elements: pedagogy, social interaction, and technology. They identify concerns and call on music educators to reset what, how, and why they teach when using technology to develop 21<sup>st</sup> century competencies, as the future of schooling continues to change its landscape due to the pandemic.*

**Keywords:** COVID-19, 21<sup>st</sup> century learning, music education, music technology, online teaching, Pedagogy

## INTRODUCTION

The use of ICT (information and communication technology) is at the heart of 21<sup>st</sup> century teaching, where teachers need to embrace change in their practice to enable wellbeing and connect with students (Johnson & Merrick, 2020) while enhancing creativity in classrooms (Ng, Ng & Chu, 2021). Ananiadou and Claro (2009) affirm that 21<sup>st</sup> century students require “knowledge and skills in key

subject areas [and] to analyse, reason, and communicate effectively as they raise, solve, and interpret problems in a variety of situations” (p. 7). Teaching in 21<sup>st</sup> century classrooms includes the ability to foster critical thinking, problem solving, communication, and collaboration in their lessons as they employ new technologies (Ertmer, 2015; Voogt & Pareja Roblin, 2012). Therefore, teachers must change their methods of teaching to help students to reach their full potential (OECD, 2018). While students in the 21<sup>st</sup> century have grown up in a fast-paced digital world, teachers require continued support and often encounter challenges in finding quality professional learning to keep up with continuous changes across ICT (Albion et al., 2015; Ertmer 2015). The issue of creating purposeful professional learning has been an ongoing need in teacher education for many years (Bauer et al., 2003; Merrick, 1997) combined with the continued demand for the creation of suitable resources. While it is beyond the scope of this paper to provide an in-depth understanding of 21<sup>st</sup> century classrooms and teaching, we agree with Seward and Ngyyen (2019) that ICT is not a substitute for the embodied experience of face-to-face instruction; rather, it provides the opportunity to reset our classroom practice.

Studies have looked to understand the factors that provide advantages and barriers in using technology (Lawrence & Tar, 2018). Wang’s (2008) work clearly identifies a framework for organising ICT-based learning using the three elements of Pedagogy (P), Social interaction (SI) and Technology (T). Pedagogy relates to strategies and approaches used by the teacher in developing and facilitating learning, combined with organisation of resources. Social interaction refers to the skills and connections that are part of daily existence, as learners collaborate in safe environments, sharing and communicating with one another. Technology involves the access to devices combined with the application of necessary ICT tools and software as part of the teaching and learning process (Wang, 2008).

This study took place in Australia where all states and territories experienced ongoing lockdowns since March 2020 in response to the global pandemic (Ewing & Cooper, 2021). Teachers used digital technologies to engage with students through emergency remote teaching using virtual platforms (Anthony & Noel, 2021). The term emergency remote teaching refers to a “temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances ... would otherwise be delivered face-to-face or as blended or hybrid course [and] that will return to that format once the crisis or emergency has abated” (Hodges et al., 2020). Many teachers moved to synchronous and asynchronous teaching, which relied on displaying knowledge about the intersection between technology, pedagogy, and content (Johnson, 2017; Joseph, Nethsinghe & Cabedo-Mas, 2021). Hollweck and Doucet (2020) claim that engaging with professional learning to transition to virtual teaching is causing tension for many teachers to decide which option to use in practice. During the time of the pandemic, Govindarajan and Srivastava (2020) found teachers required support on the ground when using technology. Yet, “few studies have been published on how music can be taught online” (Horspool & Yang, 2010, p. 16).

As tertiary music educators based at two metropolitan universities in Melbourne, we (authors) seek to understand how music teachers look to employ technology as they modify and adapt their learning environments (Merrick, in

press). The notion of how to teach music online is not entirely well-known (Bowman, 2014; Johnson, 2017). Joseph and Lennox (2021) found that the online environments do not lend themselves to repetitive, embodied, spontaneous, and interactive experiences for music teaching. In addition, the digital divide that exists amongst learners does not help the situation when teaching online (Seward & Ngyyen, 2019). Therefore, not overloading students, and their families means scaling back on what can be taught and what is expected of students when teaching online (Drane et al., 2020; Finkel, 2020). While technology offers students the chance to “manage their own learning, creating opportunities for the making, creating, receiving and producing of music” (Burnard 2007, p. 38), engaging them in deep learning (collaboration, communication, creativity, and critical thinking) is challenging. Music teachers had to modify their content and delivery (Camlin & Lisboa, 2021; Joseph & Trinick, 2021), pushing the boundaries of peer learning and social engagement (Kalogeropoulos et al., 2021). In this paper we discuss one focal question from our wider study *‘Reimagining the future: music teaching and learning, and ICT in blended environments in Australia’*: what were some of the concerns using ICT during Covid-19 pandemic?

### **Methodological stance**

Once ethical approval to undertake the study was granted by Deakin University in March 2021, peak national music organisations in Australia provided consent for their members to participate in the study. They advertised the invitation on their website and through social media with a link for members to read the Plain Language Statement outlining the study which included the link to undertake the anonymous online survey. Participation was voluntary. This paper draws on the data collected between March-June 2021.

Purposive sampling was used as an effective way to collect information from music teachers who represent states and territories across Australia (Gay et al., 2012; Wisker, 2008). We used Qualtrics as online platforms (Heen, et al., 2014) and employed mixed methodologies (Cohen, Morrison, & Manion, 2017; Creswell & Clark, 2017) that allowed participants to respond to a range of quantitative and qualitative items. The demographic of participants were music teachers who complete the survey containing closed and open questions (Krosnick, 2018). The survey was trialled and tested by sending it to a small sample of music educators (primary, secondary, and tertiary) testing for ambiguity.

Using Thematic Analysis, we were able to examine the responses to one specific question: What were some of the concerns using ICT during Covid-19 pandemic? This allowed us to investigate this issue in-depth, exploring the meaning and interpretation of the teachers within this context (Braun & Clarke, 2012). Using Braun and Clarke’s (2006) six stages of thematic analysis: familiarisation with the data, coding, searching for themes, reviewing themes, defining and naming themes, and writing-up, we read and re-read the responses to establish consistency (Boyatzis, 1998; Javadi & Zarea, 2016). The process was time consuming as we independently coded the data using margin notes (Braun & Clarke, 2006). From the process of analysis, the credibility of the feedback was found to be aligned with the initial responses from music educators in the pre-test (Fereday & Muir-Cochrane, 2006). The inductive analysis allowed recurring and prevailing themes to emerge. The survey provided a “rich

description of the data overall” (Braun & Clarke, 2006, p. 84). In the findings section, we identify and discuss advantages, disadvantages, opportunities, and challenges in relation to three elements of Pedagogy, Social Inclusion and Technology (Wang, 2008), with specific reference to one survey question.

## FINDINGS: MUSIC TEACHERS’ PERCEPTIONS AND ATTITUDES

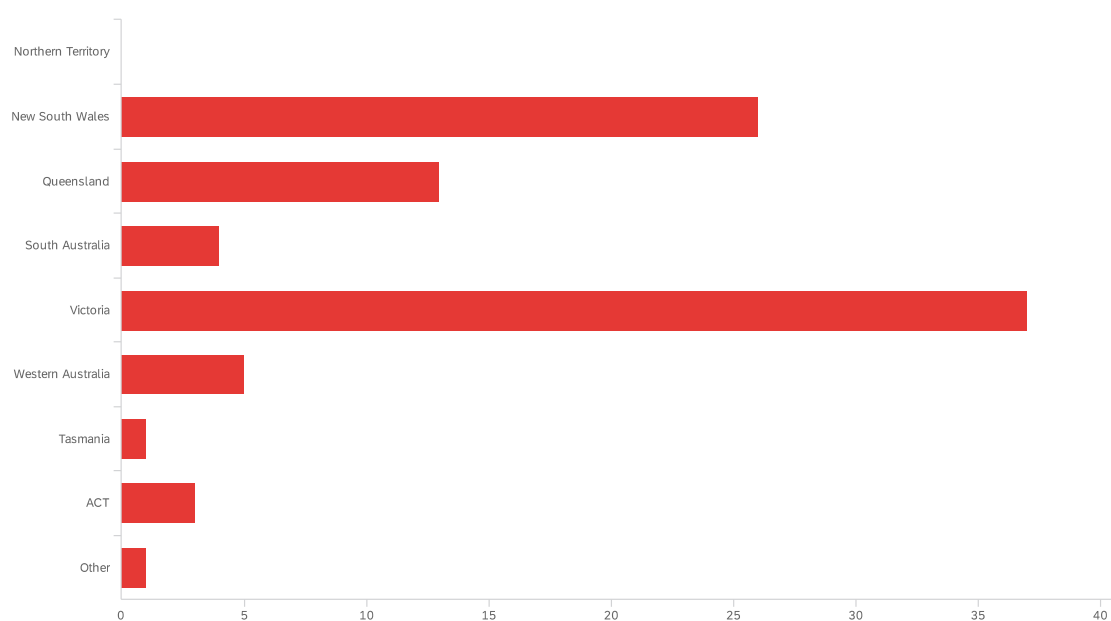
In this section we share some key findings to illuminate the varied and all-encompassing nature of teachers’ experiences in using ICT as a tenet of 21<sup>st</sup> century classroom practice to enable creative adaption and thinking, in combination with the application of new ideas and solutions to problems (Kaschub & Smith, 2014). An overview of the demographics of the data between March-May 2021 provides a context of respondents’ age, location, type of school settings and gender. These descriptive statistics are not presented for analysis but rather to assist the reader in understanding the range of participants.

### Music teacher’s demographics

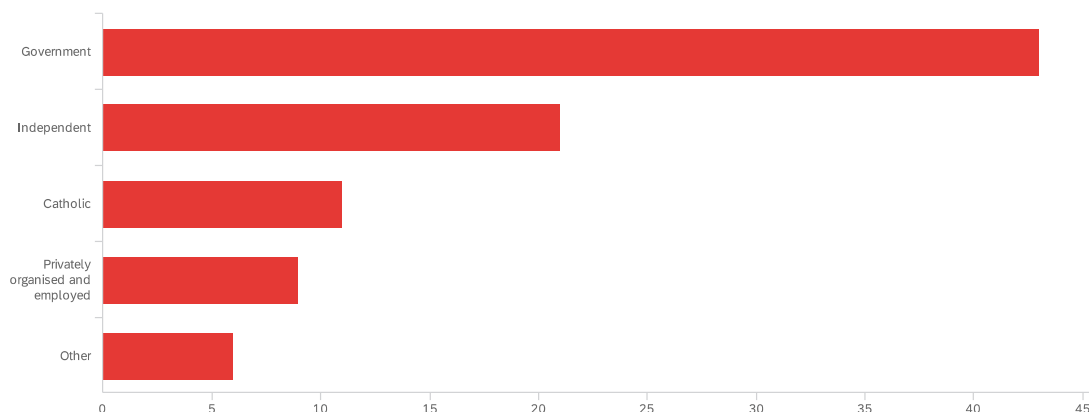
**Table 1:** Distribution of responses by age categories of teachers

Age Group (years)	Percentage of Responses	Cumulative Percentage
20-25	1.1%	1.1%
26-30	4.4%	5.5%
31-40	16.5%	22%
41-50	29.7%	51.7%
51-60	35.1%	86.8%
61-70	12.1%	98.9%
70+	1.1%	100%

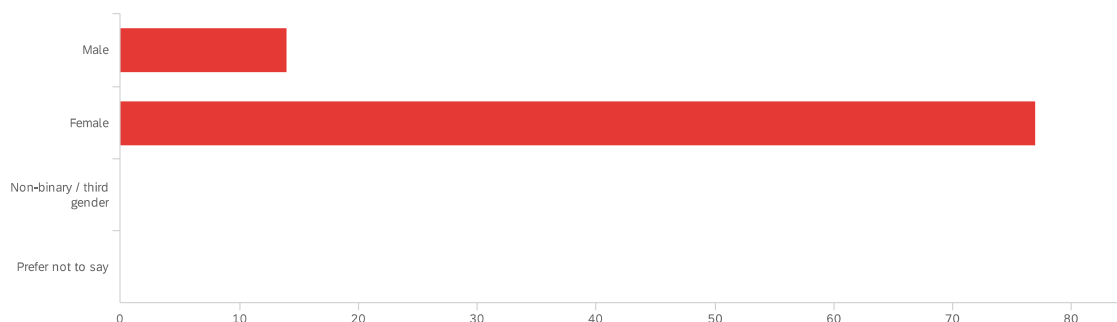
**Figure 1:** Location of respondents across Australia



**Figure 2:** Distribution of school settings



**Figure 3:** Gender distribution of participants



The numerical tally (Table 2) provides a count of teacher responses relative to three elements and key themes which are discussed below.

**Table 2:** Numerical count of element-based responses and key themes

<b>ELEMENTS</b>	<b>Advantages</b>	<b>Opportunities</b>	<b>Disadvantages</b>	<b>Challenges</b>
Pedagogy	10	9	3	2
Social Interaction	9	4	4	5
Technology	7	4	9	10
<b>Total Count</b>	<b>26</b>	<b>17</b>	<b>16</b>	<b>17</b>

**Reflections on the advantages of using ICT**

It was encouraging to note there were many positive comments about using ICT during the pandemic. Many teachers felt that they “were able to continue teaching music and without ‘tech’ this would not have happened”. It was apparent that “a lot of people quickly up-skilled in the use of ‘tech’”, which “allowed learning to continue in different ways”. Teachers identified the following advantages that arose:

- ICT helped us stay connected with our students during the remote learning period of 2020 (SI)<sup>1</sup>

<sup>1</sup> Brackets indicate categorisation of responses in relation to Pedagogy (P), Social Interaction (SI), and Technology (T) as used in the discussion.

- (Although) some kids were very advanced (and) others not so - the ICT allowed them to work individually (relative) to their skills (P)
- I couldn't (have) got through COVID without it (ICT) (SI)
- Using ICT is very accessible for today's students (SI)

When referencing the additional benefits of teaching remotely, they also observed the following advantages:

- I surprised myself at how quickly I was able to embed these into teaching during Covid (P)
- (The) students becoming more adventurous in their usage of ICT. (T)
- (ICT) allowed instrumental lessons to continue during the COVID lockdown, when they otherwise would have ceased. (SI & T)
- (I was) able to mirror an iPad to laptop and share via M.S. Teams. (T)
- (I was) able to teach a student in another part of the world without the cost and time to travel. (SI & T)

Many teachers found that using a range of programs and equipment proved beneficial including:

- Using Soundtrap have been great for composition tasks both individual and group (P & T)
- Online teaching offered students to revisit and regularly review material this fostered the use of synchronous and asynchronous delivery (SI, T, P)

Teachers also found that the experience offered flexibility in relation to the teaching process and how they engaged with students saying:

- I find that the students watch and copy what I am doing on the screen, and I can work more intensely with individual students during the activity - it is like having two of me in the room! (P)
- I have more time to connect with individuals while everyone else carries on independently (SI)
- I am no longer "essential" to the running of the program - anyone can manage the lesson (P)
- (I felt) significantly lowered teacher fatigue (P)
- Students (could) watch and copy what I (was) doing on the screen (SI & T), and I can work more intensely with individual students during the activity (SI & P) - it is like having two of me in the room! (P).
- I have talked to other music teachers in special education settings in my network group, who have continued to use materials like these now (T) we are back teaching "in real life", and they report similar experiences (P).

### **Reflections on the Opportunities created with ICT**

Amidst the adaption and use of ICT for teaching online and remotely, many teachers found a range of opportunities that arose out of the experience that included:

- (Being able) to create many instructional videos for online apps such as Bandlab, Auralia and Musition (P & T)
- Digital technology being leveraged in such a way for some students to gain entry into music they otherwise may have found it difficult (SI, T, P)

- Using Chrome music lab's song maker (made learning) much more accessible (P & T).
- Turning PowerPoint songbooks into movie song books (T and P)
- Using Screencast, so I [the teacher] was in the video as well (T and P).
- Increased exploration of chat rooms (Zoom) to collaborate and create group tasks (P & SI).
- More PD was available online, or at a time of my choosing, so I haven't had to worry about the health risks of face-to-face PD, or travel time/arrangements (P).
- Students were generally very engaged, they shared their ideas and helped each other out (SI & P)
- Those who were amazing and had extra time, showed "how did you do that?" (P), the kids were excited to show each other how (SI).
- Synergies with other KLA's (P).

### **Reflections on the Disadvantages of using ICT**

The participants noted a range of areas that impacted their work, including schools having different equipment, little technical support and varied access to music equipment when working from home, teaching remotely. Their comments reflect the following areas:

- My school was not allowed to do any online learning provision as it was considered inequitable - not all of our students have technology available for use at home. (SI & T)
- The main issue for music teaching is the audio lag in online meetings and thus the inability to clap or sing in time with others. (T)
- Quality in sound and video, lag in audio, variable position of camera affecting perspective of the conductor's movement in space. (T)

Teachers identified the challenges involved in online delivery, identifying the following:

- It took intensive time and effort to set up strategies and processes for ITC learning (P & T)
- The recording, editing, and uploading of media was a lot of work (T).
- Their devices were charged, they had forgotten to do so, or it was broken (T)
- At home they didn't always have devices to work with (T)
- Some larger families with only one computer found it difficult to complete online work for all students (T & SI)
- The school encouraged the use of hard copy work those parents would pick up and drop off (P & SI)
- Reading an e-score [PDF] or seeing and hearing an e-score was not accessible for all students (SI, T & P)

### **Reflections on the Challenges created with ICT**

It was apparent from the reflections of teachers that the challenges of using ICT were prevalent in many ways, including:

- The inevitable time delay and audio distortion was impossible to achieve the visceral-authentic learning experience that happens in a face-to-face real-time musicking event. (T)

- Internet reliability; knowing the possibilities of the programs
- Internet connectivity issues proved disruptive (T)
- Internet access was limited (T).
- Not having enough devices in the classroom is always a challenge (T & SI).
- Technical difficulties on zoom, delay/lag making it impossible to do group music making in real time (T).
- (Having to) explore some different tools that I have never used in my teaching before (P).
- The 2.5 second delay makes it impossible to undertake 'normal' music making activities, and this was frustrating for many students (T & P).
- Not all servers are equal. (T) Many students had difficulty doing work in peak (usage) periods. API in some browsers is also not standard (T).
- Trying to establish a rapport with students in a digital setting challenging (SI)
- Trying to do group music making over zoom challenging and not enjoyable. (P & SI)
- Using more ICT takes away from relationships with students (SI)
- Families didn't have suitable technology or skills to enable good online lessons (SI & T). It didn't matter how good my technology was, if the technology at the other end wasn't good (T).

## DISCUSSION

The 21<sup>st</sup> century has been impacted by technological innovation, digital communication and expansion of collaboration and learning, providing new opportunities for connection, preparing learners for the future (Johnson, McAlpine & Merrick, 2019). Although the construct of learning may have been previously viewed as a separate entity, 21<sup>st</sup> century learning is conceptualised as contributing to a larger eco-system, whereby there is increased engagement amongst stakeholders with constant adaptations and changes in the transactions that occur across contexts, whether it be the classroom, the rehearsal room, the studio, the home or beyond. Looking towards 2030, “today’s innovations become tomorrow’s commonplace” (OECD, 2019, p. 13). The OECD (2019) identifies many requisite capacities required for effective learning, placing an increased emphasis on new skills and attributes within the learning process, such as flexibility, teamwork, entrepreneurialism, shared-values, interdependence, personalised learning, and dynamic, flexible curricula.

### Pedagogy

The analysis of teacher responses highlighted a positive acknowledgement of the way that ICT enabled connection, access, and sustainability in being able to work during and through the COVID-19 pandemic, creating purposeful learning using 21<sup>st</sup> century technologies (Johnson, 2018). The data identified how teachers enjoyed and engaged in the opportunities to explore and create new approaches to teaching, looking at new pedagogy and connections with their students. This aligns with the work of Davidova (2019) for teachers to rethink their practice and gain new competencies. Many teachers were positive about using ICT tools; it



allowed them to support the development of their students' individual learning and their autonomy in the learning process (Carey et al., 2017). Teachers indicated an increase in confidence and efficacy as they became more accustomed to linking their use of technology to new pedagogical knowledge and content, which Bauer & Dammers (2016) identify as being essential components to ensure teaching success. They embraced the opportunity to use a combination of individual and group instruction in the online environment, while some noted the authentic mode of instruction for the 'real-life' scenarios they were facing (Lombardi, 2007). This often-mirrored aspects of teaching that utilised online and blended approaches to learning (Pulham & Graham, 2018). Another positive finding was that although restricted by travel limitations, teachers felt that they were still able to access a wide range of online music professional learning opportunities (Merrick & Johnson, 2020; Joseph, 2021).

Amidst the positive experiences, teachers also acknowledged and identified some of the disadvantages and challenges that arose when forced to teach remotely using ICT. They specifically referenced the enormous amount of time spent in preparing their lesson using ICT as they taught for extended periods during lockdowns. Other issues included the perceived limits of teacher expertise, restricted access, and teaching in varied locations with minimal parent involvement or support. Teachers felt that they did not have a suitable repertoire of strategies, resources, and teaching processes to work remotely. This finding highlights the need for more ICT based pedagogy to be embedded in teacher preparation courses that specifically informs teaching in a pandemic age (Kaschub & Smith, 2014).

### **Social Inclusion**

Music research has shown how technology could enhance wellbeing, connection, and collaboration during the pandemic (Johnson & Merrick, 2020; Joseph & Trinick, 2021). Many teachers commented on similar aspects of social inclusion that the ICT and online experience fostered. Whether it was the opportunity to combine synchronous and asynchronous experiences that kept students connected (Merrick, 2020; Johnson, 2017; Yamagata-Lynch, 2014) or the interaction and cooperation using Zoom and Teams. The increased level of engagement and willingness for students to share in the learning process, or the opportunity to innovate and complete tasks as co-learners (parents, siblings, the community) provided myriad positive experiences and advantages (Joseph & Lennox, 2021). The focused and intentional social connection of teaching in this environment, reflects 21<sup>st</sup> century learning capacities (OECD, 2019).

Teachers identified several concerns in relation to ICT affecting students' social inclusion that were both negative and challenging. Often these socially based issues arose around access to ICT itself, coupled with having the necessary equipment and internet connection. This created a lack of equity, and subsequently led to inaccessibility of learning opportunities for many students. For 21<sup>st</sup> century learning capacities and experiences to be successful, there needs to be ways to ensure that there is equitable access and inclusion for all learners (Ananiadou & Claro, 2009). Teacher comments on this aspect were consistent. Environmental factors such as many students with one machine, ongoing delay in sound (latency) or connection, location of the learning also contributed to negative social learning experiences with limited levels of enjoyment.

## Technology

There were a notable number of advantages and opportunities that emerged amongst the teachers as they reflected on their technology usage during COVID. A key factor was the ability to maintain lessons, even if travel or isolation impacted attendance. As an extension of the teaching process, the technology (whether software, hardware, or the internet) allowed the continuity of learning to be maintained amidst the disruption to school settings and restrictions on face-to-face teaching. Another positive component of the teaching that arose in the reflections was the advantage of being able to combine technologies to teach, such as mirroring the teaching via camera with a tablet, and then sharing this via the software Teams, to enable explicit instruction from afar. Here, innovation and adaptive practice were enabled through the application of technology (Merrick, in press). This enabled an increased level of self-reflection and regulation amongst the students and teachers as they could now archive, access and review materials whenever needed (Merrick, 2020). Teachers referenced the development of many new video-based resources, and teaching stimulus, which then became archives and material that could be re-used and revisited in different learning situations, highlighting the flexible and creative ways that teachers engaged with the technology at this time.

One teacher commented, however, that “It didn't matter how good my technology was, if the technology at the other end wasn't good” this was problematic. The main issues related to the variable quality of sound and video, the limitations of equipment (i.e., camera placement), the difficulties in developing, editing, and uploading material, combined with the ongoing management and maintenance of devices (including battery charging, software updates, repairing broken equipment), all of which impacted the ability for teachers and students to engage in the learning process. Underlying these factors was the continuous dependence on sustained internet connectivity (broadband and wireless), including speed and consistency. These issues are not new and have been apparent in the use of technology over many years (Ramorola, 2013), with numerous challenges having been noted historically (Howard & Mozejko, 2015).

In sum, the data in Table 2 above aligns with Wang's (2008) three elements (P, SI, & T) as teachers realised several advantages and opportunities through the diverse ways that ICT enabled innovative approaches to teaching, combined with increased focus on social inclusion. Conversely, the greatest challenges and disadvantages were attributed to the technology itself, whether referencing the tools or the connectivity. When read in conjunction with the commentary already provided, these important aspects will be further considered as this study continues.

## Implications

Whilst we have come a long way since the ‘postal system’ of ‘correspondence teaching’, 21<sup>st</sup> century practice needs to be developed to effectively improve student learning in the online environment. Despite teachers having to reimagine pedagogies, they need ways to support student learning in the online setting. The swift change to using ICT has meant many teachers have not had sufficient training in how to “monitor discussions, provide ample and rapid feedback, and reward argument, critical thinking, and creativity to the learner online” (Schultz &

DeMers, 2020, p. 4). If this can happen then deep learning may occur online resonating with 21<sup>st</sup> century teaching where students are introduced to “active, collaborative, and supportive learning community[’s] composed of both fellow learners and instructor(s)” (Schultz & DeMers, 2020, p. 4).

As the pandemic continues to impact face-to-face classes, educational settings like schools are called to ensure that students have some training to maintain flexibility regarding using virtual learning platforms (Anderson et al., 2020). We agree with Daniel (2020) that approaches to remote learning need special attention. The uncertainties of returning to face-to-face teaching is met with anxiety for teachers, parents, and students. Schools need to reassure them with “targeted communication” to alleviate anxieties that they may face (Daniel, 2020, p. 93). In a similar way, teaching staff need online training where external experts work alongside teachers training them how to effectively use learning management platforms, minimising administrative duties and maximising teaching time (Zhu & Liu, 2020).

As this paper focuses on music teaching, we fully support the recommendations offered by Joseph and Lennox (2021, pp.11-12). We argue that the cost incurred to ‘call in experts’ or pay for staff to undertake further professional learning will enable staff to include critical thinking, problem solving, communication, and collaboration in their lesson. If teachers continue to receive minimal support in their use of ICT as identified in the findings, they may be reluctant to explore new ways of engaging with technology. While music teachers have learnt much from 2020, more work is needed on how to bridge the digital divide that impacts student learning. If snap lockdowns continue to prevail in Australia, we recommend that teacher education programs have an increased responsibility to train initial teacher education students to work effectively with ICT in the ongoing COVID environment. We concur that “the use of educational technology and the development of digital competence” is imperative in teacher education programs (Calderón-Garrido & Gustems-Carnicer, 2021, p. 148). In this way, teachers may be better prepared to include digital technologies, innovative activities, creative thinking, and problem solving in their practice (OECD, 2018; Victorian Government, 2020).

## **FINAL REMARKS**

Undertaking this study, analysing teacher reflections from one question has revealed a range of concerns that music teachers encountered using ICT during the pandemic. As part of the ongoing wider study, more of our findings will be shared in future publications. The views shared in this paper only refers to music educators, thus a limitation in itself. Therefore, generalisations to other learning areas in other countries are not valid. Our snapshot has shown that music educators in Australia have “varying beliefs, attitudes and opinions on using the online environment for learning music” as a response to the COVID-19 crisis (Johnson, 2017, p. 452). Nevertheless, the pandemic has offered teachers the opportunity to rethink the future of music teaching.

A longitudinal study with students and stakeholders (principals, leading teachers, music professional organisations, parents) is needed to measure the impact of the pandemic and teaching music. We agree with Anthony & Noel (2021, p. 15) that this “will create a roadmap to further improve the adoption beyond the pandemic using technology”. Since March 2020, the pandemic in

Australia has given educators across all education settings and learning areas the opportunity to “hit the reset button, change the rules and fix once and for all the inequities that make inclusive education impossible” (Doucet et al., 2020, p. 7). While the breath of the preliminary findings is applicable to all learning areas, further consideration is needed to develop a range of 21st century skills and capacities that prepare students for life in an unpredictable and changing post-digital world.

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