

Classrooms and chat rooms: augmenting music education in initial teacher education

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Abstract

This paper reports on a design-based research project that investigated the possibilities of creating a novel learning environment in a music teacher education course that would enhance student engagement and learning outcomes. It substantiates the pedagogical possibilities and practicalities of implementing instructional delivery technologies to augment music education as a valuable and productive way forward in addressing ongoing issues of quality and sustainability in initial teacher education. A range of pedagogical possibilities used to augment face-to-face interaction is presented. These illustrate how creating opportunities for students to engage in a range of social interaction and collaborative activities encourages a diversity of perspectives and dynamic exchange – a technological revolution through instructional evolution.

Key words: music teacher education, design-based research, instructional delivery technologies.

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Background and rationale

For a number of years, people have been declaring the advent of the “digital native” born of the “Net generation” (Jones, Ramanau, Cross & Healing, 2010). These terms describe members of a generation whom have been exposed since birth to the internet and hypertext. There is an expectation that this group think and process information differently from previous generations. In some universities this has led to calls for curricula and instructional delivery technologies to be revamped in order to cater for these “new learners.” The growing importance of educational design recognizes that students’ needs are becoming more diverse, that teaching staff are under increasing pressure to provide better education with fewer resources, and that employers’ expectations of new graduates are not

diminishing. Reproducing traditional practices can be efficient if the environment is static, but in times of transformation, pedagogical methods need to be rethought, “We have to build the means for e-learning to evolve and mature as part of the educational change process, so that it achieves its promise of an improved system of higher education” (Laurillard, 2006, p. 71).

Running parallel to the Net generation discourse is a broader discussion amongst tertiary education providers about the potential of instructional delivery technologies for enhancing student learning outcomes. A number of Web 2.0 technologies, specifically blogs, wikis, and podcasts, are currently implemented in higher education courses for a range of learning purposes. Blogs for instance have typically been used for students to record their reflections about their learning experiences or to share their insights

about the learning content with other students (Farmer, Yue & Brooks, 2008; Instone, 2005; Osman & Koh, 2013; Tsingos, Bosnic-Anticevich & Smith, 2014; West, Wright, Gabbitas & Graham, 2006). Whereas wikis are commonly used for students to collaborate over the production and publication of course-related content (Bruns & Humphreys, 2005; Forte & Bruckman, 2006; Venkatesh, 2014). Podcasts, on the other hand, are often implemented for delivering lecture material or other learning content and there are reported examples of more innovative uses of student-generated podcasts (e.g., Chan, Lee & McLoughlin, 2006; Frydenberg, 2006). With respect to other new and emerging technologies, Waycott, Bennet, Kennedy, Dalgarno and Gray (2010) present a comprehensive literature review about how tools as mobile phones, MP3 players, social networking and online gaming can enhance learning outcomes in higher education contexts.

This paper reports on how instructional digital technologies can be used to augment existing face-to-face learning modes in a Music Education course in response to increasingly diverse student cohorts. A number of authors have highlighted a need for an approach to designing university courses that are more inclusive of students' diverse learning needs and the need to deliver courses in learning environments that are more supportive of students' preference for different learning modes (Lu et al., 2007; Richmond & Liu, 2005). Blended learning offers a platform through which to facilitate this (Heinze & Procter, 2004). The term "blended learning" is often used interchangeably with "online delivery" (Oliver & Trigwell, 2005), however for the purpose of this study, blended learning refers to a course that is delivered in a mixture of modes incorporating a range of different media.

The existing literature on implementing courses via blended learning is extensive demonstrating an increasing range of practices and possibilities. More recently the research has focused on the efficacy of blended learning approaches

for enhancing student learning outcomes. For example, Al-Qahani and Higgins (2014) report clear increases in students' achievement as a direct result of implementation of blended learning systems. Furthermore, students' views were found to be "highly positive" towards blended learning in terms of accommodating their learning styles (Uğur, Akkoyunlu & Kurbanoğlu, 2011).

Universities need to administer access to this vast array of instructional delivery technology to ensure they are utilised for the intended learning purpose. Universities across Australia, and internationally, do this through virtual learning platforms or Learning Management Systems (hereafter, LMS) that provide the web-based framework to handle all online aspects of the learning process. These systems cater for a more diverse student population, however, the underlying assumption that digital learning technologies better cater for the learning needs of the "Net generation" does often not take into account the motivation and expertise of academics and the context in which they currently operate. For instance, Australian universities and their academic staff are foremost measured on their research status that puts pressure on lecturers to invest more time on research outputs. Under these conditions the uptake of new and emerging technologies is, in the authors' experience, patchy and varied. This claim is supported by results from a recent study by Kaznowska, Rogers and Usher (2011) which demonstrates that not all university faculties are equally responsive to implementing the range of available learning technologies in their courses. Their data showed students in visual and performing arts, education and the humanities had the lowest availability of instructional delivery technologies (40%) whereas the sciences, mathematics and computer sciences had the greatest availability (nearly 60%).

Research by Ocak (2011) identified eight key issues that constrain instructor's willingness and ability to adopt a blended learning approach in their courses including complexity of the

instruction; lack of planning and organisation; lack of effective communication; need for more time; lack of institutional support; changing roles; difficulty of adoption to new technologies; and lack of electronic means. Ocak (2011) calls for systematic and sustained discussion around the complex pedagogical and technical implications of blended learning, and complement this with increased technological support for instructors in order to minimise these issues.

We acknowledge that extensive research has been undertaken that explores the benefits and pitfalls of blended learning. However, it takes the view that in some instances the utilisation of instructional digital technologies in higher education has not always achieved the goal of transforming the delivery of course curricula to fully online, off-campus modes and the subsequent effects on learning outcomes are not evident. It does not question whether this mode is preferable, instead it examines how to better utilise instructional digital technologies in such a way as to complement, augment and amplify traditional modes of course delivery and on-campus learning in music education. This paper also acknowledges the ever evolving nature of instructional digital technologies and the rapid pace of change limits the generalizability of this study, however the learning outcomes achieved by the students in this Music Education course indicates that the combination of instructional digital technologies used to augment traditional modes of delivery is worth sharing with the broader audience in higher education who are training music teachers in Australia and internationally.

The research context

The project that is the focus of this paper is one part of a larger research project that was internally funded with a university learning and teaching grant. The research for that project examined ways to build staff capacity to

implement instructional digital technologies over a selection of primary teacher education courses. The project was approved by the University ethics committee and was implemented in 2011-2012 at a large multi-campus university in South East Queensland. Three academic staff members who convened different teacher education courses purposefully selected a range of instructional digital technologies to deliver their respective course curriculum. Survey and interview data was obtained from students and staff about their experiences using different instructional digital technologies and their efficacy in enhancing for enhancing students' learning outcomes (see Sammel, Weir & Klopper, 2014).

This paper reports on the findings from this larger research project that specifically relate to the outcomes in an Music Education course where instructional digital technologies were used to augment existing face-to-face learning modes. Initial teacher education in Australia has been condemned for its inability to produce teachers with the necessary confidence to teach even the simplest levels of artistic skills (Russell-Bowie, 2013). This re-emerged as a concerning finding in the *National Review of School Music Education* (DEST, 2005) and later in the *National Review of Visual Arts Education* (DEEWR, 2008). From author experience, a large number of students entering primary teacher education programs have limited formal education in all five learning domains covered by the Arts curriculum: music, dance, drama, visual arts and media arts. This situation demands scaffolded learning and time to develop these students' professional capacity, and yet face-to-face time for university courses is under constant pressure to diminish (Russell-Bowie, 2002; Klopper, 2007; Lummis, Morris & Paolino, 2014). A consequence of these circumstances is that many of these graduating primary teachers report a lack of sufficient discipline content knowledge and limited pedagogical content knowledge to properly implement the Arts curriculum in primary classrooms (Russell-Bowie, 2013).

The Music Education course in question is a semester-long (13-week) core course for all first year students enrolled in the Bachelor of Education (Primary) program. It is the only course in the program that is dedicated to a single domain of the school curriculum for The Arts (all of the other curriculum domains are combined in another course). The course provides an introduction to music teaching for general primary teachers and equips students with musical knowledge and skills as well as pedagogical strategies to bring music to their classrooms. A review of student feedback data over the past three years reveals that students generally found the course outcomes difficult to achieve by the end of the semester. Further questioning revealed that the main issue for students was trying to balance work and study which often favoured work when it came to on-campus commitments. This situation was the inspirational platform research focus in the context of this Music Education course which is to examine the learning potential of instructional digital technologies selected to augment existing face-to-face learning modes in an undergraduate Music Education course.

Research methodology

In this study design-based research was an overarching methodology to systematically observe and reflect on the implications and effects of employing instructional digital technologies to augment existing face-to-face learning modes in an undergraduate Music Education course. The Design-Based Research Collective (2003) argues this approach assist in the creation and extension of knowledge “about developing, enacting, and sustaining innovative learning environments” (p. 5). They discuss the value of attending to the educational context claiming it “is not simple but it produces a better understanding of an intervention, and it can lead to improved theoretical accounts of teaching and learning” (The Design-Based Research Collective,

2003, p. 7). The goal in this research context is to understand the how a blended learning approach can alleviate the problems constraining students’ engagement and learning outcomes in music education. The type and purpose of each pedagogical intervention in the course is described in detail in the following section.

Sitting within design-based research is a mixed-methods approach to studying pedagogical practices that combines quantitative and qualitative data. Quantitative data was used to gather evidence of the effect of the pedagogical intervention and was collected from three sources: tracking data from the LMS; students’ final grades; student course evaluation survey scores. This evidence was complemented with qualitative data obtained from students’ responses in a focus group interview that aimed for deeper insights into students’ experiences with utilising the new technologies to improve (or diminish) their learning outcomes in this course. The findings obtained from analysing each data set were then synthesised to ascertain any positive effects of the intervention. Combining the findings in this way enables a broader perspective on different aspects of the pedagogical intervention that are effective pedagogies for engaging and enhancing student learning.

The intervention

A previously stated goal of this research project was to explore how instructional digital technologies could augment existing face-to-face learning modes in an undergraduate Music Education course. How this goal was achieved through blended learning is described here in terms of the types of instructional digital technologies that were implemented, how they operated and their respective learning intent.

The course was implemented according to the university’s mandatory model for course curriculum delivery that allows a maximum of three hours on-campus, face-to-face teaching per week (one hour lecture and two hour tutorial) with a further seven hours of independent

study. The lectures were designed to present the mostly theoretical content via direct transmission mode, while the tutorials were meant to be more interactive with the focus on practical application of the lecture material. The university LMS course website was used for accessing and administering a selection of instructional delivery technologies based on their ability to augment best features of face-to-face interaction and offer synchronous and asynchronous learning opportunities. To this end, the LMS enabled provision in the following ways:

Course content was available in a folder allocated for each week of the semester that contained lecture notes and associated power point slides, any other recommended readings and other learning materials.

An automated *Lecture Capture* system recorded the lecture each week. The recording is uploaded to the course site within ten minutes of the lecture concluding. This allowed students to repeatedly access the lecture asynchronously for further engagement, reflection, and clarification and catered for those students absent from the lecture.

The *assessment vodcast* was recorded to provide more detailed, verbal explanations of the instructions on each assessment task. These vodcasts are simple voice-over recordings of on-screen texts. In this class a vodcast was created by the lecturer to provide a verbal/visual explanation of the assessment expectations that could be accessed anytime throughout the semester by

students and sessional teaching staff. Utilising this tool in this way creates less confusion amongst students and staff around how the course learning outcomes will be assessed and the intellectual quality or standard of achievement expected.

The *Wimba classroom* (or virtual learning environment) was opened for synchronous interaction with the lecturer five times during the semester with each 'class' lasting 50 minutes duration. This technology required explicit teaching about how to use Wimba which was implemented via a short, interactive presentation during the first tutorial. Further text-based support materials were provided on the LMS to guide the student through installing and running the *Wimba Wizard* on their personal computers. The reason for using was to support students as they undertook their written assessment task. These sessions focused on more generic university skills such as understanding the academic genre, interpreting assessment and using the prescribed readings as references for their essay. While this virtual learning environment offered synchronous interaction it was decided to archive all the sessions to allow asynchronous membership and access. This proved valuable for those students unable to participate during synchronous availability.

A course menu link to *Other resources* gave students access to a folder containing non-essential learning materials such as suggested

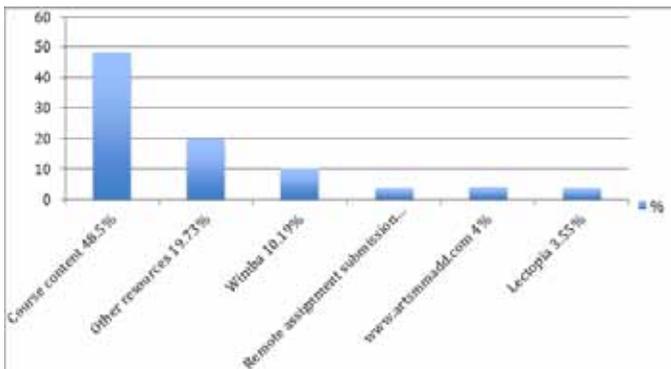


Figure 1: Access of source.

further readings, relevant websites and tips and hints for assessment tasks. It was also utilised as a link for students to upload and share curriculum materials for teaching music in primary school.

Student assessments were also handled by the LMS via an online assignment submission which included text-matching software as a plagiarism detection tool. This process reduces handling and so reduces the turnaround time for assignment marking and it also reduced paper usage.

The research findings

Access to each of the instructional digital technologies implemented in the course was tracked by the LMS and reported in terms of frequency. A representation of access by source is presented in the table below. It does not argue for any one source to be better or superior to another, but rather provides the backdrop to discuss the potential of each source to support the achievement of the learning outcomes through scaffold learning.

Not surprisingly the Course Content received the highest access which could be based on either the fundamental nature of this aspect of the course and on the ease of access via the LMS. In contrast a relatively low access rate was recorded for the new instructional delivery technologies implemented in this course such as *Lectopia* and *Wimba*. The high rate of student attendance in lectures partially explains students not utilising the *Lectopia* recordings but the low access rate for the *Wimba* classrooms required further investigation.

Any interpretation of the access data is limited however it is supplemented with data from the focus group interviews which provides deeper insights into students' experiences with the instructional digital technologies implemented in this course. The focus group consisted of a small group of students (n=11) and the aim of the discussion was to ascertain how students were using the digital learning resources and which technologies they perceived as enhancing their learning. The data generated by this discussion

was particularly revealing about the low access rate recorded for the *Wimba* classroom. A few students reported difficulties in locating *Wimba* because they unaware that this 'classroom' was a virtual learning space as evidenced by the question, "Where is the *Wimba* classroom? You have not advertised the location." This comment brings to light the assumptions and expectations that academics often hold of a generation whom have been exposed to the internet and hypertext since birth and the associated belief that today's students think and process information differently from previous generations. Reflecting on this unsustainable pedagogical expectation led to acknowledging the importance of explicitly teaching the skills required to access and use instructional digital technologies to enhance the course learning outcomes.

The focus group data did provide deeper insights into how students use different technologies and how they perceive them to enhance learning. For example, students were quite clear about their preference for the course content being organised into weekly folders as they could appreciate the links between the lecture and associated course learning resources. They indicated that this arrangement was appreciated as it saved them a lot of library and database search time with one student commenting that this layout enabled him to "pinpoint the learning outcomes for each week and tie all of the resources together". Students claimed they were more motivated to engage with these resources because the lecturer selected them and therefore they assumed these resources were directly aligned with the course learning objectives. However there is still an apparent reliance on face-to-face contact as all students agreed that they still needed the weekly tutorial sessions to further tie the content together and align it with the assessment requirements.

The remote assessment submission process was also identified as a positive change to the course. Students reported that the feedback they receive from the online plagiarism tool incorporated

into the submission process provides valuable feedback as this highlights where they could improve their referencing and it meant they felt “more accountable” for their citation skills. It also meant they could submit a draft attempt and have the time (24 hours) to reflect and revise before they could re-upload their final document. Students also found that feedback provided by tutors who marked online (using the *Track Changes* function word processing function) was more timely and easier to read and furthermore, it was retrievable to reflect on when they were completing other assignment in the future.

When the discussion centred on students’ preferences for digital instructional technologies over traditional teaching methods the majority of the group were positive about some of digital technologies implemented but a significant number claimed preference for campus-based learning that involves personal communication and some print-based resources. Some students were quick to recognise that these technologies do cater for different learning styles. They also indicated a clear preference for technologies with ease of access and identified those which assisted their learning such as the *assessment vodcast* because of its role in clarifying the course assessment expectations and because “it both could be accessed around the clock”.

The data that provided evidence of the efficacy of the intervention in terms of improving the course outcomes was obtained by a comparison of students’ final grades and student feedback survey scores between the cohort in the year prior to the intervention (Cohort 1), and the cohort that experienced the intervention (Cohort 2). Student engagement is broadly understood as “the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcome” (Krause & Coates, 2008, p. 493). It is advocated that enhancing student engagement hinges on institutions and staff actively creating opportunities for students to “interact with staff and peers to benchmark their

learning so as to reaffirm their sense of self-belief and avoid feeling left behind” (Baldwin & Koh, 2012, p. 114). A goal of this research project is to facilitate more opportunities for more students to interact with teaching staff and their peers through utilising a combination of instructional delivery technologies better cater for diverse learning needs. These interactive opportunities are designed to enhance student engagement which should have a positive effect on the overall course learning outcomes. This presumption is based on the findings from the National Survey of Student Engagement (Carini, Kuh & Klein, 2006) which highlight a link between higher levels of student engagement and improved learning outcomes.

Analysing the frequency distribution graphs of mark allocations of comparative semesters has the facility to benchmark relative performance of each student group (see Figure 2). Improved student engagement with learning should be reflected in an elevated median mark which demonstrates that more students achieved better learning outcomes. Improved student engagement is also evident in a reduction in the number of students whose marks sit in the tail of the distribution that is less failing the course and so better learning outcomes for all students. The data shows that after the intervention the median mark rose from 64% (a Pass grade) to 69% (a Credit grade) and the standard deviation (spread of marks) fell from 15.85 to 13.70 indicating a shorter tail to the distribution. At the same time the number of students who failed the course fell from 11.1% to 2%. These results suggest that the intervention had some positive effect on student learning in terms of their final grades. However, on its own this data has limitations when conducting a comparative analysis of sequential offerings of the same course mainly because of the composition of each student cohort.

Further quantitative evidence of the effects of the intervention was obtained by comparing the scores from the university administered online survey of student feedback between each course

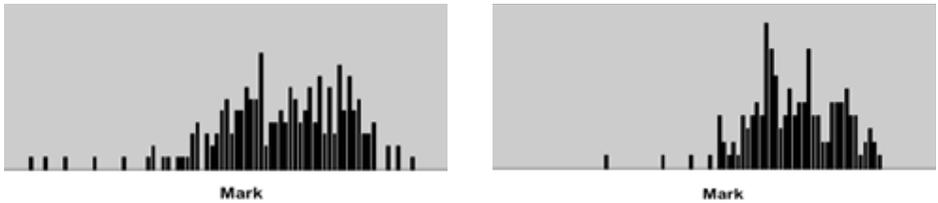


Figure 2: Frequency distribution graphs of mark allocations for comparative semesters.

offering. This survey is a measure of student satisfaction with a course that is indexed on a scale from 1 (lowest) to 5 (highest). The survey has explicit statements about student engagement and the efficacy and the pedagogy as aspects of the course that contribute to overall student satisfaction. Comparing the survey scores before and after the intervention confirmed that there was a slight improvement (0.1) of overall student satisfaction with the course, from 4.1 to 4.2. The biggest improvement in satisfaction rating (0.3) is in the utility of the assessment feedback whereas the ratings for student engagement and the teaching in the course improved slightly (0.2). Once again this data set is limited in explaining the effects of the intervention until further insight is gained from the qualitative data.

Combined together, the quantitative and qualitative data suggests that the intervention had some significant effects in terms of enhancing the course learning outcomes and in relation to understanding how students use a selection of instructional digital technologies. The data

also highlighted that students' experience with different technologies is not homogenous nor is it predictable and this has important implications adopting a blended-learning approach to designing and implementing university courses more generally.

Implications for music education

This paper presents research that examined how to better utilise instructional delivery technologies in such a way as to complement, augment and amplify traditional modes of course delivery and on-campus learning in a music teacher education course. The research findings indicate that the student cohort who experienced the intervention were more engaged with the learning materials and achieved better course results. While these intervention effects cannot be solely attributed to the suite of new learning tools implemented, comments made by students do suggest that the technologies which allow asynchronous access such as *Lecture Capture*, the

Table 1: Survey scores for student evaluation of music education course Cohort 1 and Cohort 2.

Student evaluation of course	Cohort 1 n = 127	Cohort 2 n = 119
This course was well-organised.	4.2	4.4
The assessment was clear and fair.	3.9	4.0
I received helpful feedback on my assessment work.	3.8	4.1
This course engaged me in learning.	4.1	4.3
The teaching (lecturers, tutors, online etc.) on this course was effective in helping me to learn.	4.2	4.4
Overall I am satisfied with the quality of this course.	4.1	4.2

assessment vodcast and (well-organised) online course content/resources enabled engagement by larger proportion of students. These findings suggest that delivering course curriculum using traditional and novel learning modes has the potential to cater for the diverse needs and interests of the Net generation which enhances student engagement in the course and this in turn can result in improved learning outcomes and overall student satisfaction with the course offering.

Pedagogical possibilities and practicalities of exploiting instructional delivery technologies to augment music education courses were confirmed to be a valuable and productive way forward in addressing ongoing issues of quality and sustainability in initial teacher education. To achieve successful learning outcomes, however, extensive evolutionary scaffolded learning is required. There are more pedagogical possibilities that augment face-to-face interaction and which can be (re)-produced by creating opportunities for students to engage in a range of social interaction and collaborative activities, and encourage a diversity of perspectives and dynamic exchange. As the educational community continues to explore and expand the use of different instructional digital technologies the collective knowledge of best practices will grow. Classrooms and chat rooms offer numerous pedagogical opportunities for music education through a variety of instructional delivery technologies - a technological revolution through instructional evolution.

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