
Title: Voice Over Distance: A case of podcasting for learning in online teacher education

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Abstract

This paper reports on a case study of an online pre-service teacher education course in a New Zealand university aimed at exploring the potential of student-generated podcasts as a form of interactive formative assessment at a distance. The study was part of a wider two-year funded project with the overall goal of documenting, developing, and

disseminating effective and innovative e-learning practice. Findings from lecturer and tutor interviews, student focus group discussion and course evaluations indicated that the podcasting task provided opportunities for the course lecturer, tutors and students to learn and share ideas with one another. The experience empowered students to develop the skills and confidence to initiate more independent inquiry into technologies to support their pedagogical purposes. The study contributes to a better understanding of the skills, dispositions and knowledge needed to prepare teacher candidates for teaching-learning contexts where ICTs are increasingly pivotal.

Keywords

Podcasting, initial teacher education, distance education, digital pedagogies, ICTs, e-learning, case study

Introduction

Imagine a future where teachers do not exclusively determine the topics and activities, prescribe sources of information, and dictate outcomes for learning. Scholars argue that future-oriented learning is characterised by negotiation, blurring of curriculum boundaries, inquiry connected to real-life contexts, and messy pathways to open-ended products for sharing (Brough, 2008; Fraser, 2013). Information and Communication Technologies (ICTs) offer students and teachers new ways to learn together. Technologies are integral as students routinely make use of tools like Google, Youtube, and social media to access information, record ideas while mobile, and network with peers to communicate and stay up-to-date with matters of personal interest. It is critical to examine how distance educators are preparing students with the necessary skills, dispositions and literacies for powerful learning through ICTs. How are distance students empowered to drive their learning at present and in the future? Student generated podcasts encourage active online student reflection, participation and collaboration. This qualitative case study of an online initial teacher education course explores the use of student-generated podcasts as a form of interactive formative assessment in a distance learning context. The case study was part of a larger-scale investigation of e-learning across multiple disciplines to leverage pedagogical change, close participatory gaps for students and lecturers, and develop and enhance a cross-university educational research culture to inform teaching practices (Johnson, Cowie & Khoo, 2011). This paper focuses on the lecturer and tutor reflections, student focus group discussion and course evaluations in the case study on podcasting.

We begin by describing the theoretical foundations of the study. We then detail our research context and the study methodology followed by the findings. This paper's discussion focuses on the pedagogical implications for educators striving to prepare students for future teaching-learning practices as opposed to measures of student learning outcomes.

Digital pedagogies and learning transformations

Three strands of thinking have shaped our conceptualisation of this study: Firstly, the dramatic proliferation of ICTs and their potential to shape teaching and learning at a distance; secondly, the challenge for teachers to be prepared to teach through ICTs; and thirdly, the influence of constructivist and sociocultural views of learning that inform our interactions with students.

Current developments in ICTs and social software provide new ways for students to construct, represent, develop, and report on what they know and understand. Drawing on a rich range of resources, in multimodal formats, students can manage their learning and express deeply personalised understanding of concepts using flexible and multiple formats and shifting space and time (Conole, 2010). Digital literacies can be developed, creating “a set of cultural competencies and social skills that young people need in a new media landscape” (Jenkins, Clinton, Purushotma, Robison, & Weigel, 2006, p. 4). We contend that future focused skills, dispositions and literacies include active co-/creation of content, collaboration and sharing.

Acknowledging these important educational affordances of ICTs and in tandem with the developments in other countries, the New Zealand Curriculum (NZC) (Ministry of Education [MoE], 2007) validates the important role ICTs play in facilitating connections for shared learning, thus expanding student learning opportunities. Integrating ICTs such as podcasts, blogs, and wikis caters for diversity in student learning approaches and supports active participation (McLoughlin & Lee, 2008). Use of ICTs and social networking software represents a pedagogical shift from the teacher as sole source of knowledge to one in which understanding and authorship are collaboratively co-constructed by teacher-student or student-peer interactions (De Freitas & Conole, 2010).

Realising the transformational potential of ICTs is fraught with challenge as educators tend to use emergent technologies in superficial ways akin to how they would teach without digital tools. Selwyn (2007) cautions against “simply importing informal Web

2.0 applications into classrooms on the presumption of transforming formal education” (p.7), while Earl and Forbes (2011) assert that,

The learning possibilities are transformed when classrooms move beyond teacher-centred transmission and when students become more than just passengers along for the ride (p.225).

Furthermore, transformation entails that the use of ICTs go beyond merely substituting a digital tool for a formerly analogue learning process, or making slight improvements via digital augmentation. Transformation begins when modification of teaching practice entails significant redesign of tasks, or ideally, the creation of entirely new tasks previously inconceivable without the affordances of ICTs (Puentedura, 2006).

There is evidence to suggest that teachers do not integrate ICTs effectively in their practice despite having access to tools (Russell, Bebell, & O'Dwyer, 2005; Vrasidas, 2014). A great deal of practice remains at the level of substitution or augmentation. Most teachers have not had the experience of growing up in a digitally saturated environment nor experienced student-centred learning strategies for themselves. Some key barriers preventing teachers from using technologies range from the realities and culture of the everyday classroom to teachers' own attitudes, skills and knowledge about technology (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Lim & Chai, 2008). Vrasidas and Glass (2005) and Hedberg (2011) highlight a wide range of factors to be considered when preparing teachers to effectively integrate ICTs in their practice. These include a considered process of collaboration between teachers and experts, successful experience in teaching with technologies, and participation in a community that provides continuous support. The onus is therefore on teacher preparation programmes to develop teachers' capacity to integrate pedagogy with meaningful learning through ICT (Koh, & Divaharan, 2011; Tondeur, van Braak, Sang, Voogt, Fisser, & Ottenbreit-Leftwich, 2012; Vrasidas, 2014). This is crucial if teachers are to lead students into an uncertain future, while engaging in deeper inquiry about learning. As Hung, Lee, and Lim (2013) highlight:

Teachers need to develop capacities to design authentic learning experiences that focus on the processes of learning, meaning-making, inquiry, as well as those which use technology to enable first-person learning experiences (p. 220).

Preparation for future learning should take account of emerging principles signaled by current innovations in education. Future directions emphasise personalisation of learning, equity and inclusivity, the use of knowledge to develop learning capacity, revisiting learners' and teachers' roles, continuous learning by educators, and new kinds of learning partnerships (Bolstad, Gilbert, McDowall, Bull, Boyd, & Hipkins, 2012).

As teacher educators, we have attempted to address these drivers of pre-service teacher education in our distance education context by providing student teachers learning online with cumulative opportunities to develop and share audio podcasts as part of their practicum and reflective experiences. Our study is underpinned by sociocultural theorising, attending to interactions between people, the tools used to achieve particular learning goals, and the settings in which interactions occur (Cole & Engestrom, 1993). A sociocultural frame emphasises human agency rather than technological determinism. What is important is that learners are active creators of content knowledge and active participants in their learning (Bell, 2011). Interaction with other learners, through sharing of podcasts for example, enables feedback and construction of new understandings. For feedback to be formative, participants must be willing to learn from each other within a community of inquiry (Garrison, Anderson & Archer, 2000), communicating sensitively via multimodal means, and building on each other's ideas.

A case of student-generated podcasts in teacher education

A podcast is a digital media file that plays sound, is accessed from a website, and can be opened and/or downloaded to play on a computer or portable player (Salmon, Mobbs, Edirisingha & Dennett, 2008). While some commentators (e.g. Burt, 2008; Campbell, 2005) restrict the definition of podcasting to episodic and syndicated use, Edirisingha (2009) distinguishes between a technical definition of podcasting emphasizing the means of delivery and access of digital media files; and educational adoption of podcasting which refers to the learning affordances of digital audio content. While the use of audio recordings in education is not new, podcasting offers advances in convenience and flexibility due to the relative ease of recording, editing and uploading, as well as accessing and subscribing to podcasts. Free and widely accessible web-based audio

recording software (such as the open source software program Audacity) enables students to record and share podcasts easily, rendering podcasting “one of the most accessible of the Web 2.0 technologies and one of the easiest to try out and adapt” (Harvey, 2008, p.xvii).

It is increasingly popular for tertiary learners to access podcasts in order to listen to pre-recorded lectures, or supplementary materials (Lonn & Teasley, 2009). However, Selwyn (2007) reminds us, podcasting to transmit information to students does not take advantage of Web2.0 capability of supporting user creation, collaboration and communication of their ideas. The learning potential is greater when distance students use podcasting to speak and listen to each other (Anzai, 2009; Powell & Robson, 2014).

Podcasting to learn is valuable for supporting learner flexibility and control, motivation and engagement, cognition and learning (Dale & Povey, 2009; Salmon & Nie, 2008; Riddle, 2010). Distance students enjoy podcasts for their complementarity to text-based study. When studying online, reading and writing constantly can have an isolating effect that makes participants long to hear a human voice. While phone calls, skype and synchronous conferencing tools are used (e.g., GoogleHangouts, Adobe Connect), our students require the flexibility of asynchronous access (Forbes, 2012). Importantly, students are motivated by the opportunity to verbalise ideas and recraft as necessary, as well as by receiving feedback from listeners (Dlott, 2007; King & Gura, 2007). Creating and sharing podcasts can enhance reflection as learners reconsider and modify their ideas based on feedback, thus illustrating its formative potential (Campbell, 2005). This is particularly powerful when podcasting is episodic, with reflection occurring at various points in the learning process (Schmit, 2007). Podcasting suits diverse students, catering for differentiated learning preferences, such as aural learners and those who need to move around (Lum, 2006). Students develop problem solving and technical skills associated with the recording, editing and publishing of podcasts throughout this process (McLean & White, 2009; Powell & Robson, 2014). They learn communication and presentation skills (Nicholls, 2008) and also find their voice in terms of efficacy, democracy and empowerment (Beilke et al, 2008). These factors justify the use of student-generated

podcasts in distance education. Podcasts afford verbal articulation, bridging distance and time, thereby complementing asynchronous online discussion.

Our research context

The aim of the case study was to better understand the potential of student-generated podcasts in supporting interactive formative assessment in an online pre-service teacher education course.

The case focused on a second year undergraduate course within the Bachelor of Teaching degree for students studying online within the Faculty of Education's Mixed Media Programme (<https://education.waikato.ac.nz/qualifications/undergraduate-degrees/bachelor-of-teaching/mmp/>). The 12-week compulsory course presents a conceptual overview of learning theories applied to classroom management and assessment for learning. The students were mature adults, geographically dispersed within New Zealand, juggling work and family commitments with flexible full-time study via Moodle (the Learning Management System adopted by our institution), supplemented by annual on-campus blocks and weekly placements in schools. There was no assumption that students already possess computing expertise (Kolikant, 2010) although, as the course was fully online, it was expected that students had access to a computer and the Internet and rudimentary skills to operate both.

The course was coordinated and taught by a lecturer (the first author of this article) with the support of two tutors. The lecturer had piloted the use of podcasting with some success to support her students' learning in a previous online course with the belief that podcasting could enhance student reflection and articulation of their understanding of theory and classroom practice. She had refined and extended its use in this subsequent implementation. She felt podcasting best supported the four pedagogical goals she had intended for the course which were; 1) acknowledge student voice through a podcast of their reflections and promote their sharing of emerging understandings as future teachers, 2) complement written modes of student learning with opportunities for oral expression, 3) complement traditional summative assessment with a more participative approach, and,

4) empower students to undertake an active approach to learning and teaching through ICTs . The lecturer elaborated on this point in her planning for the podcasting task mid-way into the course:

...The bigger picture is this is not about the ICT, it's not about me giving them a neat trick for the classroom, but what I'm trying to do is to show that now is thanks to Web 2.0 there is freely available software that can be downloaded on any machine. You can learn to drive it yourself because there is enough help out there on the Net via YouTube clips and forums, which you learn yourself without going to some PD (professional development) courses or night classes, and then you can run with it. The next step from this is, now I have done some podcasting how about I try to create a blog, a wiki, a website, install try new tools. This is empowering to know there is a never-ending sea of resources and tools teachers can use, and that the innovative potential is up to them, and to share with their students. (Lecturer)

Students used the open source programme Audacity (audacity.sourceforge.net/) to produce their podcasts which they then uploaded to share with their discussion groups via Moodle. However, there were also students who chose to use other software such as Wimba Voice (wimba.com) and GarageBand (apple.com) to accomplish their podcasting tasks. Each of the three teacher educators (lecturer and two tutors) initially generated a podcast each in order to model the process for the students, and guided them to produce two podcast episodes (three minutes each) for the purpose of “podcast-mediated reflective learning” (Ng’ambi, 2008, p.133). The opportunity to create two episodes enabled students to develop and improve with successive attempts. The first episode required students to share and reflect on their observations of assessment approaches during a six-week teaching practicum while the second episode, due three weeks later, entailed a synthesis of the students’ emergent teaching philosophy and the kinds of teachers they would like to be in the future. Students were provided with detailed instructions and an online help forum within Moodle with ongoing technical support from the university’s e-learning staff to support their podcasting experience. The podcasting task was not graded but was a compulsory part of the course requirements.

Methodology and data collection

An interpretivist methodology framed the research data collection and analysis process (Maykut & Morehouse, 1994). Interpretivist research is characterised by descriptions and interpretations of key phenomena related to teaching and learning processes and focuses “on the bigger picture of lessons learned and not just the immediately developed results”

(Reeves, McKenney, & Herrington, 2011, p. 61). Interpretive methodology is therefore consistent with the intention of uncovering the significance of events as experienced by research participants (Bell, 2004) so that worthwhile improvements to learning can occur. This epistemology is further congruent with a sociocultural framework that values the social and cultural contexts for how knowledge is co-constructed through interaction between individuals and tools through joint activity (Wertsch, 1998).

Data was gathered from face-to-face lecturer and tutor interviews regarding the value of the podcasting tasks in supporting formative assessment in the course. A member of the wider e-learning research project team conducted the half hour long interviews based on an interview protocol (see Appendix 1). An end-of-semester online evaluation of the impact of podcasting on students' learning (see Appendix 2) as well as an online student focus group discussion (see Appendix 3) (Mann & Stewart, 2000, 2004; Williams & Robson, 2004) further informed the study. The questions in the course evaluation were open ended and administered through the course Moodle site. The online focus group operated as a separate discussion forum within the course Moodle site and gathered evidence of students' formative learning experiences as they encountered and completed each podcasting task (see Appendix 3). Forty-three students out of the class of 80 (54%) in the course responded to the course evaluation while 17 students participated in the focus group discussions.

Consistent with qualitative research, a constant comparison approach to data analysis was adopted in which the text-based data was read and re-read (Lincoln & Guba, 1985). Through a process of inductive reasoning (Braun & Clarke, 2006) emergent themes were identified and then reported, discussed, and debated by the research team during regular team meetings.

The participants in this study represent a convenience sample of the experiences of a lecturer, tutors and students in an online teacher education course in one university-level context and are not representative of possible participants across different university settings. While the case study findings cannot be generalised to a wider population, nevertheless they can be related to similar tertiary education teaching contexts and can

provide nuanced insights into issues and practices relevant to similar pre-service teacher education contexts. The study received formal university-level human research ethics approval and participation was on a strictly voluntary basis.

Findings

Two key themes emerged from the findings of our study, highlighting the potential for teachers and students to learn together and the future focused skills, dispositions and literacies valued in the learning process. Throughout each theme, the student teachers readily visualised transference to working with children in their own classrooms. These are elaborated next with representative participant quotes.

The value of co-learners and the co-learning process

The teacher educators and students valued learning from one another to connect, support, share and expand the teaching-learning opportunities in the class. For example, the course tutors mentioned how they positioned themselves as co-learners in the podcasting exercise. In this way, the teacher educators signalled to students that they were willing to learn alongside them and to experiment and take risks with new technologies. A tutor explained:

I shared with my students that I was new to this too. I also shared issues I had about listening to myself and how helpful it was to write my ideas first and then record myself talking in a conversational manner rather than reading it. (Tutor 1)

Modelling to students demonstrated that teachers should be learners too and willing to take risks! The same tutor reflected on this point:

This is about helping the students to use technology to enhance learning. Putting theory into practice for them. If we are going to put our students into that position where they are required to record their voices, we should be doing it too. (Tutor 1)

As a result, students valued being able to listen and learn from the teacher educators' podcast efforts. The style of the staff podcasts essentially reassured students that teachers are learners too. That is, despite students feeling an initial discomfort with the new technology, perfection was not required and it was fine to make and learn from initial mistakes. An example of a student response in the course evaluation (CE) was:

I listened to a few [podcasts] before I recorded mine, and to a couple of the lecturer podcasts before practicum started just so that I could get the feel for how they sound etc. The lecturers' podcasts made me feel more at ease... they were not rehearsed. (Student, CE)

This experience helped students recognise and value the learning process instead of solely focusing on the learning outcomes.

It was particularly noteworthy that students learned from listening to each other, as sharing and feedback within the class community was a valuable source of inspiration. Students explained that listening to each other triggered thoughts and further reflections, and in turn increased their understanding of content and potential application. For example:

I think listening to the teachers' ones and to our peers' is good, and we get to hear many different ideas that people are using in the classroom which adds to our own learning. (Student, CE)

Additionally, the opportunity to produce more than one podcast episode was crucially important in enabling reflection, revision and refinement of ideas as part of a formative approach to learning, as a representative student focus group (FG) quote explained:

First time around I don't know how many recordings I made before I posted, this time round I posted on my first attempt. (Student, FG)

Furthermore, students valued the podcasting experience as an example of using ICTs to consider and create teaching and learning opportunities for diverse teaching and learning contexts. They felt they could readily transfer their discoveries about podcasting to support their own students' learning. For example:

You could also use podcasting for absent children - if they are absent because of a long-standing illness or are admitted to hospital or are recovering from surgery. You could also use podcasting for children that are on long trips overseas. (Student, FG)

[Podcasting is] a valuable communicative tool, which I will certainly use in my own class room one day with any number of curriculum areas- make plays, interviews, poetry, story telling, social studies or technology research.... (Student, FG)

Students recognised the potential of podcasting in terms of how children's podcasts can be easily shared with those interested in their learning; parents, families, and the wider school community. These interested others importantly provide an authentic purpose,

context and audience for student work as well as input into their learning. A sample student quote highlighted this point:

Recording [classroom] students' work on a podcast, such as their poems, stories and plays etc. and then downloading them onto classroom wikis or webpages would allow parents and others interested to hear their children's completed work and stay in tune with their work. It would also give the students more meaning to their work, when podcasting to an audience, rather than to just write for the teacher. If the students are aware they will be recording their work for a larger audience, they would be more likely to take greater responsibility in their efforts. (Student, FG)

The value of teachers and students and students amongst their peers working together as co-learners was evident as they learned to use and create their podcasts. Opportunities for students to reflect on and provide feedback to one another to revise and refine their work was invaluable in this process of learning about and with podcasting to support their own pedagogical contexts and children's learning outcomes.

New skills, dispositions and knowledge supportive of future pedagogical practices

As they reflected on their podcasting tasks, students became aware of new skills, dispositions and knowledge needed for learning and teaching in a digital environment. Part of this included learning to inquire about and to select the appropriate technology (as exemplified through podcasting) for different learning and assessment goals (be it to problem solve, collaborate or reflect). The tutors and students commented on the value of podcasting for supporting diverse learning needs:

[The students] are used to writing assignments or being in discussion groups. Now they have to put their thoughts together, synthesise it in 3 minutes and talk through it. It would be out of the realm of comfort for some while it would be comfortable to others...It opens another door for students in terms of learning. Having different ways of assessment- condensing from 2000 words [essay] into 3 minute [podcasts] changed the way students presented their work. It was a new skill for most students. (Tutor 2)

Hearing rather than just reading gave a different element to learning, it made the paper more engaging as it was different than that of another Word document. (Student, CE)

Students appreciated the multimodal nature of the podcasting task and the fact it supported reflection-in-action and collaborative reflection:

Podcasting is another great way to reflect on your learning... Sometimes writing can be a chore, and being able to talk out loud can sometimes help you see something from a different angle. You could also send this recording to a peer to listen and discuss with you, which might be less of a chore than writing about it. I also think it's good to practice using the different technology, because so much of it is used in the classroom these days. (Student, FG)

A key consideration in maximising the learning with and through podcasting is that students needed to be active in generating instructional materials and brave when communicating their own ideas. As two students explained:

As life is, the more you practise something the more it becomes part of you, and with using ICT in this way and having more than one go at it during the paper, sure gets us into the ICT swing of things and into thinking in that way as a natural part of what we do. (Student, FG)

I have learned that we must not let fear stop us from trying out new ideas. Reflecting on teaching for me still proves to be an immensely worthwhile exercise. During practicum I reflected daily by way of typing up of notes but podcasting I think, would also be a way to reflect. (Student, FG)

This bravery/courage is an important disposition to enable the first steps to be taken. In time, with subsequent attempts, students developed confidence:

Being such a technophobe I was not looking forward to doing this podcast at all... However, I was delightfully surprised at how simple it was to construct and record a podcast. (Student, FG)

I found your confidence grows second time around. (Student, FG)

Students appreciated and valued their overall learning to podcast experience in their own teaching and future classrooms:

Like many I have enjoyed listening to others podcast and how creative they can be. We live a technological age and this is a fantastic hands-on inquiry learning tool. I enjoyed podcasting... I will definitely be using this a lot when I get my own class. (Student, CE)

I can see great value in using podcasting in the classroom, especially for students who do not always show success with pen and paper activities...[this] opens the door to many new and different options. (Student, CE)

The lecturer acknowledged these students' ideas and elaborated on how empowering and relevant the podcasting experience was for students' future teaching careers:

The power is in the student voice and when students are podcasting. That's why I wanted to do this with our students podcasting, its not very much a leap for them to see that children can podcast too and that Audacity is easily usable by a child and it's the child's voice that can be out there. That's the big picture in terms of student voice, podcasting by children, podcasting transfer to the classroom but looking beyond podcasting to the empowerment that comes from knowing that you can download any series of tools and learn to use it practically independently or in collaboration with others and you can run with it and turn it to your own purposes to enhance teaching and learning (Lecturer).

Two representative student quotes summarised the relevance of the podcasting tasks as a basis for future possibilities in their practice:

I would not hesitate using it in the classroom now that I have tried it and would imagine that my students would devise hundreds of different ways to utilise it. Perhaps they could podcast their speeches onto their e-portfolios. (Student, FG)

I can see great value in using podcasting in the classroom, especially for students who do not always show success with pen and paper activities... it opens the door to many new and different options. (Student, CE)

The findings evident in this theme highlight vital skills, dispositions and knowledge for future teachers and learners, including the ability to inquire, discern and select appropriate tools that are fit for diverse learning purpose(s). Apart from learning about the technicalities of podcasting, and developing dispositions such as being brave and confident to experiment with new technologies and to express their ideas students could see the potential of podcasting in their own pedagogical contexts. Through experimentation and selection of appropriate technologies, students and their children can use different modes to communicate and participate actively within a classroom community.

Discussion and conclusion

This study sought to understand how student-generated podcasts could enhance formative assessment in an online pre-service teacher education course. Student teachers were encouraged to create podcasts in order to share reflections and obtain feedback from peers as an example of how ICTs can support formal learning goals and foster communication of ideas, collaboration and reflection. In doing so, students were faced with an open-ended task, with considerable freedom of expression. They were asked to share directly with peers, and to interact to provide feedback on each other's podcasted ideas. The feedback would prove formative as the students acted to improve their podcasts in a subsequent episode. The underpinning technological challenge required students to download, install and learn to operate unfamiliar software in order to complete the reflective episodes. Active learning and adaptive help seeking on the students' part was therefore expected and supported in the context of an authentic challenge. Fundamentally, the use of podcasting is just a case in point and intended as the basis for further exploration of ICTs that are fit for purpose in their practice (including technologies that are yet to be imagined).

Our study makes the case for the pivotal role teacher educators and teachers have in shaping future oriented thinking and practices. For change to occur, it is vital that all educators, including lecturers, school leaders and classroom teachers engage in inquiry and model innovative and creative pedagogies (Hedberg, 2011). Positioning educators as future makers and leaders in a climate of change importantly implies the following: Firstly, enabling students to generate content and resources like podcasts (or blogs or wikis) values student voice, active involvement and co-construction of learning. These democratic ideals are fundamental to the vision of the New Zealand curriculum (MoE, 2007), and of wider relevance internationally where value is accorded to “democratic principles such as young people being actively involved in their education, making contributions to society and taking responsibility for their learning” (Fraser, 2013, p.7).

Secondly, a focus on future-oriented education requires that teachers, teacher educators and students develop awareness of tools for learning. This includes the ability to locate, select, download and use ICTs to serve a variety of learning purposes. It is not always necessary for teachers to know in advance which software, mobile apps and digital tools will be used in a unit of work. Rather, as the inquiry unfolds, the need for new tools will arise. Locating these tools, and finding free versions of a software or app is part of the fun and indeed part of the learning for students and teachers working together. For example, when students want to create a podcast, they might experiment with various voice-recorders (digital and portable), iPad apps (e.g., VoiceMemo, Audiolio) and free software (like Audacity). By engaging in these experiments, comparing and reflecting upon results, students will find tools that are the best fit for purpose and more importantly learn key lessons about the availability of tools, and the need to critically appraise their value in particular learning contexts. Being open-minded and curious, yet discerning and practical are central dispositions for digital literacy and future thinkers. If teachers insist on making all of the decisions about teaching tools, in order to stay ‘one step ahead’ and safeguard students from error, they effectively rob children of the learning opportunities inherent in making these discoveries and choices.

Thirdly, transformative teaching and learning through ICTs occurs when educators design purposeful digital challenges in learning contexts as rich tasks and as a basis for inquiry. The value of doing this is accentuated when the challenges are designed in negotiation with students, and when rich tasks allow significant and genuine leeway for student choice and voice. Not only do teachers need to expose students to a variety of tools, they need to support students to develop reflective capabilities to engage with and integrate ICTs effectively in authentic learning situations. The student teachers in our study saw value and relevance in their podcasting experience and were hopeful that elements such as multimodal, collaborative and formative pedagogies could inform and perpetuate their own future classroom practice.

Fourthly, incorporating ICTs in learning contexts requires a degree of digital literacy and technical capability. Most educators and students have only limited access to formal technical support. A future oriented vision necessitates a resourceful approach to technical capability. It is essential for such a vision to include the pro-active use of resources derived from online support sources that is transferable to the classroom, as well as encouraging teachers and students to make use of wider Professional learning networks (PLNs) to problem solve technical issues. In this way, technical support can be shared and sustained. In practice, this might mean establishing learning-oriented networks within existing social movements like Twitter (twitter.com) and/or using the New Zealand Ministry of Education's purpose-built professional communities like the Virtual Learning Network (vln.school.nz).

Finally, when we take a future oriented approach to pedagogy, our teaching requires us to tread a fine line between challenge and support, direction and freedom, monitoring and trust. While our findings are related specifically to podcasting in this paper, the implications are that learning together for the future entails that teachers and students work together as co-learners. Teachers can cultivate confidence in students by being realistic and open about the risks, discomfort and first steps involved in learning. Teacher willingness to experiment and to be seen to make mistakes or to be imperfect can help students feel at ease with the learning processes. The importance of peer-to-peer sharing

and learning is also generalisable and generative of new learning as are the prospects of wider connections with communities. Experiences in teacher education therefore, if varied, challenging and student-centred, can be transferable to the classroom and can inspire new teachers with further creative pedagogical possibilities.

The way we have worked with tertiary students in our distance programme need not be so very different to professional learning for practicing teachers, or classroom practice with children in schools. Adults and children can make important decisions about their learning, negotiate directions for inquiry, engage in research and reflection, generate podcasts or other digital legacies, and share these with others for mutual learning and feedback. Both adults and children require support throughout the process, benefit from having more than one attempt, and develop confidence with time and experience. Just as we encourage our remotely located student teachers to take their podcasting adventures into the classroom with children, we also consider this to be a realistic and worthwhile study for all classroom teachers. Learners of any age can be publishers and producers of their own ideas, using ICTs.

In conclusion, our exploration of student voice and affordances of podcasting has reaffirmed that student perspectives are a vital guide for future directions in teaching and learning. As we look to the future, we are hopeful that beginning teachers will have the confidence to experiment with technologies and innovative pedagogies, actively involve children in adopting a problem solving approach to learning through ICTs, and build learning networks for sustainable support of their adventures in teaching and learning. We hope that experienced teachers and school leaders will support these initiatives and join in with their own classes to ensure that the exciting possibilities of future education meet the needs of future learners.

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Appendix 1 – Lecturer and Tutor Interview Protocol

1. First, if you could briefly describe the podcasting learning activity(s) in your paper.
2. In order to create this learning activity, how did you prepare for it?
3. In relation to the podcasting activity this semester...
 - a. what's working well?
 - b. what's not working well?
4. What sorts of response (if any) have you observed from tutors or students?
5. What's surprised you (if anything)?
6. Do you think podcasting has enhanced the students' learning experiences?
7. Is there anything else you'd like to add to what we've discussed so far?

Appendix 2 –Course valuation questions pertaining to the podcasting task:

1. Please comment on the overall value of the podcasting exercise
2. How could this exercise be improved next time around? Please explain your answer.
3. Please comment on the support received for this task.
4. Any additional comments about podcasting in this paper?

Appendix 3 – Student Focus Group Questions

[Forum posting on 1 July] Online focus group discussion question about the podcasting task:

Thank you to those who filled in the consent forms and left them for me here on campus. This is much appreciated and I hope you will join this research project by completing the survey linked in this section, and by coming in here to talk about your podcasting experiences. In this way, you can shed more light into how podcasting is for you, and what it might mean for your learning.

So, having just had the session with [NAME OF TECHNICAL SUPPORT STAFF] this morning, and the talks about podcasting on campus, how are you feeling about it all?

What are your honest opinions about podcasting in this paper?

[Forum posting on 27th August] Online focus group discussion question discussing the first podcasting task:

Now that you are half way through your practicum, you will have seen some assessment and carried out some yourself, and be planning more for the next three weeks...

So, a good time to start podcasting.

I'm looking forward to hearing from some of you who are giving this a go now.

Do tell us how you are approaching your podcast and what your thoughts are as you go through this experience

[Forum posting on 6th October] Online focus group discussion question discussing the second podcasting task:

So now that you are thinking about your second podcast episode for this paper, how has your thinking about podcasting changed?

Any differences the second time around?

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