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Epistemological Considerations for Approaching Teaching in an On-Line Environment Aboriginal and Torres Strait Islander Teacher Education Program: Reconsidering TPACK

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Abstract: This research inquiry explores teacher educator knowledge, understandings and beliefs informing their teaching in a web-based Australian teacher education program for Aboriginal and Torres Strait Islander students. Through the use of a phenomenologically aligned interview process, the study investigates instructors' consideration of practice for teaching in an on-line environment. Using the TPACK framework (Mishra & Koehler, 2006) as a lens for analysis, what emerges from the data is how lecturers' knowledge and beliefs about students influences the roles they adopt as educators, and how this influences, in turn, what and how technology is used to support student learning. The study ends by critiquing and re-conceptualizing TPACK and providing insights that program developers and teacher educators need to consider in the conceptualization and enrichment of web-based learning, especially those which engage with minority students, such as Aboriginal and Torres Strait Islander learners.

Introduction

Any cursory attention to the educational technology literature, both nationally (Australia) and internationally, draws immediate attention to the prominence of the Technological, Pedagogical and Content Knowledge (TPACK) framework in informing technology use in teaching. Commensurate with this attention in the scholarly literature is the attention given more recently nationally to TPACK in initial teacher education (ITE) because of the Commonwealth government funded Teaching Teachers for the Future Project (TTF) for fostering Information and Communication Technology inclusion in teaching practice (Chigeza & Jackson, 2012). The TPACK illustration of the three intersecting circles representing the three domains of professional knowledge required of teachers for using Information and Communication Technologies (ICT) commonly frequents the educational technology literature. The visual representation (Figure 1) draws attention to the complex and amalgamated knowledge base required and used by teachers in informing their teaching practice where Information and Communication Technology (ICT) is encouraged or required. Based upon Lee Shulman's (1986) seminal paper on the multi-dimensional nature of teacher knowledge, the TPACK model is informed by three specific and intersecting knowledge domains including Content Knowledge (CK), Pedagogical Knowledge (PK) and Technology Knowledge (TK); two of which (CK and PK) were explicated by Shulman. As presented by Shulman, CK focuses on knowledge of content whereas PK represents a deep knowledge about the processes of teaching and learning, including knowledge of learners and their contexts (Shulman, 1986). In the formulation of the TPACK model, Mishra and Koehler

added a further dimension and acknowledge the significance of knowledge of technology (TK) as a "separate form of knowledge from knowledge of content and pedagogy" for informing teaching practice. Simply, TK is knowledge about technologies and the skills required to operate technologies.

The graphic used to represent the TPACK framework makes explicit that these knowledge structures, although discrete, also overlap on a planar rather than three-dimensional level, suggesting that educators *concurrently* consider these three knowledge domains in their planning and teaching. The overlap draws attention to the intersection of the categories of professional knowledge teachers require and, often unconsciously, navigate in the enactment of teaching that utilises ICT (Information and Communication Technology). As illustrated in Figure 1, the spatial overlap between pairs of knowledge categories accentuates the imperative for thought processes and actions that give evidence of teachers' simultaneous consideration of what are often perceived as mutually exclusive domains (Shulman, 1986). For this reason, the TPACK model explicates the importance of the triadic relationship among technology, content and pedagogy in the identification of pedagogical content knowledge (PCK), Technological Content Knowledge (TCK) and Technological Pedagogical Knowledge (TPK). Further, the model explicates the emergence of a triadic relationship amongst all three knowledge categories in the Technological Pedagogical Content Knowledge (TPACK). This emerging triad advocates or a "nuanced understanding of the complex relationships between and among technology, content and pedagogy responsive to learners, and using this understanding to develop appropriate, context-specific strategies and representations" (Mishra and Koehler, 2006, p. 1029).

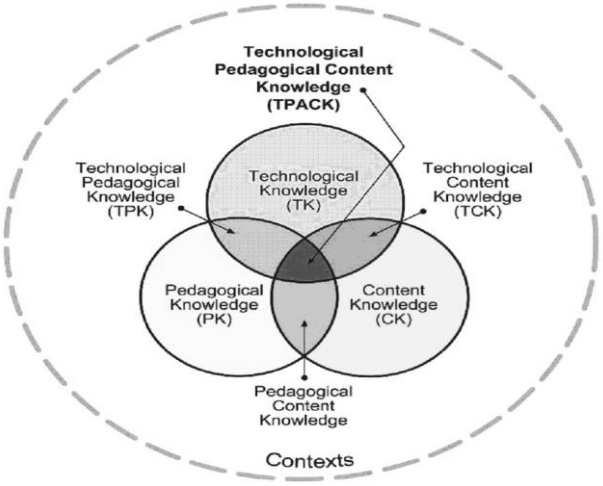

Figure 1: TPACK Model (from Mishra and Koehler, 2006, p. 1029)

The initial illustration of the TPACK model by Mishra and Koehler in 2006, unlike Figure 1 above, did not explicate the significance of 'Contexts', although the reference to context is embedded within their initial TPACK commentary. More commonly the TPACK triad is now illustrated located within the centric of context implying, as Mishra and Koehler first considered, context influences the operationalising of the model for educators. Although the TPACK framework has been used by researchers to ascertain the kinds of knowledge required by teachers to integrate technology in a dynamic transactional way, the context in which the framework is grounded has not been a particular focus in research (Koehler, Shin & Mishra, 2012). Koehler et al. (2012) concluded that further investigation of TPACK and the contexts in which it is developed and impact on it, should be an important dimension of future research.

The reference to TPACK in context has been highlighted in several articles, but few of these are research-based giving any detailed attention to how the context impacts upon teachers use of technology. As suggested by Chigeza and Jackson, "a notable absence from the TPACK framework is precise information about where, when and how to consider teacher knowledge about individual learners" (2012, p. 3). This claim is supported by Porras-Hernandez and Salinas-Amescua who have recently asserted, "the majority of published work [on TPACK] refers to the context element in a rather general manner" (2013, p. 224), especially in giving little attention to learners and the contexts in which they are located. This in itself makes TPACK problematic because of the long-standing imperative to focus pedagogic practice on knowledge of learners, including their context as a foundation for meaningful learning (Ausubel et al, 1968). As endorsed by Biggs (1978, 2003) in his 3-P learning system model, consideration must be given to what he refers to as *presage* factors prior to learning engagement. These factors include student factors such as prior-knowledge, abilities, intelligence, personality and home background. Despite the application of Bigg's model to the ICT education literature (Hamilton & Tee, 2008) with its emphasis on presage factors, Porras-Hernandez and Salinas-Amescua (2013) emphasize that reference to context, including student factors, in the TPACK literature remains generally 'ambiguous'. They claim that 'context' is fraught with multiple meaning' such as (1) classroom and institutional conditions, especially physical resource availability, (2) situated teaching activities, often curriculum influenced, (3) student characteristics and (4) teacher epistemological beliefs. An examination of the literature is dominated by points (1) and (2) above, and, as Porras-Hernandez and Salinsa-Amescua state, reference to point (3) and (4) are mentioned in the TPACK literature in "a general manner and without further elaboration" (2013, p. 228). It is these points, student characteristics and teacher beliefs, and the dynamic between these two attributes this study explores. The explicit reference to context – especially with reference to student characteristics and teacher's beliefs - is the focus of the study. The study seeks to understand how context influences instructors' use of technology in a web-based learning environment – albeit in a web-based environment that challenges any mainstream consideration of an 'orthodox' learning environment.

Context of the Study

This study is located within a unique teacher education program in North Queensland, Australia now referred to as RATEP. RATEP was originally conceived as the Remote Area Teacher Education Program provided for Aboriginal and Torres Strait Islander students who sought to become teachers while still residing in their home communities. The program developed from an on campus program, AITEP (Aboriginal and Islander Teacher Education Program) introduced in 1977 (York and Henderson, 2003). AITEP provided opportunities for Aboriginal and Torres Strait Islander people to study ITE as an on-campus enclave course. Henderson and Coombs (1989) found that, over the years, AITEP retention and success rates were decreasing, especially for those pre-service teachers (PSTs) from remote and isolated communities. They cited the main reasons for this decline as "homesickness, family obligations, living expenses and fear of losing culture." (2003, p. 77). RATEP was designed to address these problems.

In 1990, a partnership with various stakeholders (Indigenous communities, Education Queensland (state government primary and secondary education provider), James Cook University and the Tropical North Queensland Institute of TAFE (tertiary vocational education and training provider) developed an ITE model that would service small and dispersed groups of PSTs in remote communities. Since its inception, ICTs have been central

to the design and delivery success of RATEP. Limited by distance and telecommunication and infrastructural access across the isolated north-eastern Australian continent, RATEP stakeholders implemented various forms of technology to aide in communication and delivery of the teacher education program. Since 1990, RATEP staff and PSTs have used unique forms of teleconferencing tools, Interactive multimedia tools, hard-drive technologies (for example, 44Mb platters, CD-Roms, DVD) and learning management systems (LMS) and online web conferencing tools such as, more recently, Blackboard Collaborate™. Blackboard Collaborate™ is an online classroom that provides a suite of online tools to aide in the communication among teacher and PSTs. The changes in technology for RATEP, over time, have been primarily based upon pedagogical decisions; that is, what practices can be used to best assist PSTs in their learning. For example, the shift from audio-conferencing to on-line conferencing arose because it allowed the learning experience of students to be enhanced, so rather than just supporting aural interactions, students were exposed to visual, tactile and other forms of interaction. At the forefront of the RATEP decision making around technology use, within the parameters of capital costs, has been the imperative to ensure the pedagogical practice is most conducive to Aboriginal and Torres Strait Islander student learning preferences and this practice is, in turn, supported by the technology used.

Over the past decade, with the emergence of the TPACK framework and its advocacy within Australian Initial Teacher Education, especially through the Australian Government Teaching Teachers for the Future Project (TTF), individuals involved in the ongoing development of the RATEP program have considered the potential utility of the TPACK model, but, also, have questioned the prominence of the interconnecting concentric circles of the model over the contextual background in which the TPACK model is imposed. As well, those involved queried the emphasis in the TPACK model on the tripartite professional knowledge required rather than on the professional practice informed by this amalgamated knowledge. At the heart of these discussions has been the awareness that the context likely strongly influences ICT choice and use by PSTs, suggesting that TPACK must be considered within the socio-cultural environment (Chigeza and Jackson, 2012). The research inquiry described herewith seeks, first and foremost, to validate or dispel this consideration amongst program participants. Second, it seeks to add to the scholarship on ICT use and TPACK, especially in promoting consideration of the potential prominence of contextual influences on ICT practice and praxis.

Theoretical Framework

Pajares' (1992) seminal article, *Teacher Beliefs and Educational Research*, has drawn attention to the influence of teacher epistemological beliefs on practice. In this article Pajares proposes several fundamental assumptions about teacher beliefs including how individuals' beliefs strongly affect their behavior (p. 325), especially teaching practice and instructional decision making (Jones & Carter, 2007). Such considerations correspond with Angeli and Valanides' (2009) claim for considerations to include teachers' epistemic beliefs about teaching and learning. This assumption has been extended more recently to the ICT literature by Olafson and Shraw (2010) who report that over the last decade, researchers (for example, Brownlee and Berthelsen, 2006; Chan and Elliott, 2004; Ozgun-Koca and Sen, 2006) have become increasingly cognizant of pedagogic practice, in particular, how teaching ICT practices are strongly influenced by teachers' epistemological beliefs. Olafson and Shraw (2010) describe epistemological beliefs as beliefs teachers have about an aspect of knowledge (in this study's case, knowledge of learners (PK), knowledge of technology (TK), and use of technology (PCK)) that is part of the broader set of beliefs that make up their epistemology.

As Hermans, Tondeur, van Braak, and Valcke (2008, p.1500), suggest "belief systems consist of an eclectic mix of rules of thumb, generalizations, opinions, values, and expectations grouped in a more or less structured way". This would support Pajares' assertion that teacher beliefs are a 'messy' construct and that teacher beliefs play a critical role in teaching practices. Although the influence of beliefs on practice has been explored in most educational contexts, it has been less commonly applied to the dimension of knowledge being referred to in this study – the integration of technology in teaching. Hermans et al. (2008) suggest that, ultimately, these belief systems influence how teachers use technology in the classroom and, thus, understanding these foundations is fundamental for fostering educators' development in using ICTs.

Only a few studies have explored the influence of beliefs on ICT practice. Palak and Walls (2009) researched the relationship between teachers' beliefs and their instructional technology practices. Their findings indicated teachers in technology-rich schools continued to use technology in ways that supported their existing teaching approach. They found that the use of technology did not transform teaching into more student-centered practice but was used to continue existing approaches to teaching. This is substantiated by Straub (2010) who found that if teachers hold a content-oriented belief (Denessen, 2007, Lewthwaite & Wiebe, 2014)) focusing on a univocal classroom discourse about their role as educators, their use of technology is limited to those practices focusing on content-delivery and the dissemination of knowledge. In contrast, Straub (2010) found that if teachers held a more student-oriented approach their ICT emphasis was on a more diverse use of ICTs, especially in terms of pursuing ICT options that promoted discursive practices supporting students in the active construction of knowledge. Palak and Walls (2009, p. 437) and Straub (2010) concluded that teachers' beliefs and practices are context bound; that is, that the situational environment influences their beliefs and practices. Straub (2010) found, for example, that teachers in highly academic schools focused on university-preparedness, as encouraged by students and the school's milieu, and used ICTs primarily for content delivery and, by so doing, utilizing ICTs in a manner that was consistent with students' future aspirations. That is, ICTs were used in a manner that was of perceived benefit for students and consistent with their learning aspirations. This view of a responsive pedagogy consistent with students' learning aspirations is supported by Ottenbreit-Leftwich, Glazewski, Newby and Ertmer (2010) who concluded, from the only phenomenological study located by the authors in the literature, that "[r]egardless of whether teachers used technology to address professional or student needs, the core underlying value for using technology was to benefit students" (Ottenbreit-Leftwich et al, p. 1331).

What is apparently absent from the literature is exploration of teacher beliefs and ICT use in contexts involving students whose backgrounds are vastly different from mainstream students, and, especially, in tertiary (higher education) contexts. As asserted by Palak and Walls (2009, p. 437), understanding ICT use must be grounded in an understanding of the dynamic that is likely to exist between context and practice.

> Technology-related professional development should help teachers work [within]…. their contextual conditions, as opposed to being built around a "one model that fits it all" perspective focusing on the technology. Future professional development efforts need to consider creating and modeling a theory of change toward a learned-centered approach.

Drawing from this assertion, in this study we seek to determine what informs lecturers' practice, especially in terms of how this pertains to ICT use? What is at the forefront of their thinking? What is the paradigm that informs their teaching and, especially ICT use? Ultimately we seek to prompt "reflection and action upon the [ICT] world in order to

transform it" (Freire, 1970, p. 123), recognizing that a uniform application of TPACK likely needs further consideration especially in non-mainstream contexts, such as the one to now be described.

Methodology

This study occurs as a response by the RATEP administrative team to better understand the practice of educators within RATEP. Overall, it seeks to understand influences on ICT practice and, by understanding such practice, identify next steps in fostering a theory of change toward a learned-centered approach through ICT use. This initial component of the study focuses on understanding how instructors approach their teaching in RATEP; that is, what informs their practice. For this reason, the study inquiry is heavily weighted, epistemologically, to an interpretivist/constructivist paradigm. The interpretivist orientation focuses on understanding how the participant gives meaning to their behavior or action (Carr & Kemmis, 1986). The explanation for the action and to explicate the thinking behind the action making them intelligible is the focus of such a paradigm (Carr & Kemmis, 1986). Understanding how 'individuals create an understanding of social life' is at the heart of phenomenological aligned research (Hesse-Biber & Leavey, 2011, p. 19). The word 'phenomena' means 'to show itself' as an expression of how individuals experience and "understand and describe the participants' experiences of their world as they see it" (Daly, 2007, p. 97). The constructivist paradigm emphasizes that research is a product of the values of researchers and cannot be independent of them. The research is not driven by a pre-postulated theory but, instead, seeks to "generate or inductively develop a theory or pattern of meaning and understandings' during the research process" (Cresswell, 2003, p. 9). Any method is encouraged that seeks to make clear participant's understandings and interpretation of their experiences in their own terms, and emphasize these as explanations for actions and behaviors.

In line with the interpretivist/constructivist paradigm, the methods used in this study focused on eliciting and understanding what informs instructors' practice. This paradigm draws significantly from phenomenology where the intention of this approach is to "understand the experience" from the "participants' views of the situation being studied" (Cresswell, 2008, p. 8). The participants for the study included all eight instructors teaching through RATEP across the four years of the Bachelor of Education in the first semester of the 2013 academic year. Instructors had been working as teacher educators, both within the RATEP and mainstream teacher education program, for a range of three to thirty years. The subjects for this semester including Health and Physical Education; Sociology of Education; Mathematics Education; Science Education; Information and Communication Technology Education; Professional Practices, and Teaching for Students of Diversity. Four weeks into the semester individual 'interviews' were held with each instructor. In line with empirical existential phenomenology (Crotty, 1996), we asked abbreviated and open questions. We were aware that we, as researchers, saw limitations in the TPACK model, especially in its lack of attention to context and thus approached our interviews with caution, using a phenomenological line of inquiry that did not privilege our pejorative view of the model. Two questions were asked: (1) what has been informing your teaching by RATEP and (2) provide an example of a teaching and learning sequence that best encapsulates this informed stance. No question was asked that explicitly asked how ICTs were used to support this action. Typically, no further questions were asked, although there were often prompts for the participant to expand more thoroughly on their comments in order to explain the action and to explicate the thinking behind the action.

On some occasions, participants used artefacts such as Camtasia™ recordings, web-links and blogs from their RATEP subject on-line site to explicate a point. On average, these initial conversations took 35 minutes. Further, three weeks after completion of the subject, two months after the initial interview, a follow-up interview was held with each instructor where one question was asked; that being, looking back at the subject, provide an example of an event or experience or a series of events or experiences in the teaching of the subject that you believe illustrates what informed your teaching practice. This further question as a post-reflective prompt was asked to provide confirmability around the research intent; that being, what informs your teaching practice in RATEP. It was anticipated that the post-teaching reflection would correspond with the initial interviews held with each participant. In all, these two interviews were purposely designed in order for the researchers to construct a story that captured the fundamental essence of participants' experiences (Van Manen, 1990). In constructing their story and the overall collective story, we recognize the limitations of the research, primarily because of the problems associated with the generalizability of any claims made from such a small, yet, in our opinion, quite diverse sample of participants (McMillan and Schumaker, 2010). Further, we acknowledge the limitations of the research in regards to reliability, knowing that participants' comments are limited to the time at which their comments were made and that at a different time or place alternative comments might have been made (McMillan and Schumaker, 2010), albeit that the follow-up interviews after the completion of the subject provides some indication of the trustworthiness of the data.

Both the initial and post-teaching conversations were transcribed and verified as accurate by the participants. As well, they were asked to adjust any aspects of the interviews in order to better illustrate the points they sought to convey. The transcriptions were then analyzed inductively around the focus of the research; that is what informs your teaching by RATEP. Since the research seeks to better understand and inform improvement in teaching in RATEP, we as researchers looked for tangible expression of how this informed stance was then manifest in instructor's teaching and their use of ICTs. That is we sought to investigate practice, and similar to Pajares (1992), what informed and influenced practice. In brief, we sought to identify any potential connection between belief and practice. An analytical grid was used to categorize themes identified within the transcriptions. In line with the research focus we sought to identify (1) what informed lecturer practice, (2) how this was evident in their general pedagogy and (3) how specifically ICT supported this pedagogy. Each researcher open coded four transcriptions ensuring that all three researchers transcribed at least one transcription common to all to ensure consistency in the analytical process. Where there was discrepancy between and among researchers in the coded examples listed in the grid, consensus was achieved through negotiation. Finally, once all transcriptions had been analyzed, we aggregated all coded responses into one grid and sought to independently identify through a cross-participant analysis common categories, under which the comments were aggregated. For example, across all of the transcripts were participant comments pertaining to a category we identified as students' geographical location. Examples of words, terms and sentences associated with this category were 'distance', "being isolated" and "They often live in remote locations'. Again, once identified independently, we sought consensus through negotiation to arrive at a list of general categories and pedagogical and ICT practices associated with that theme. This structured procedure corresponded with the analytical approach endorsed in empirical phenomenology which assumes a structure exists in the shared experiences of a phenomenon, and, by so doing, the methodology, including analysis, sought to reveal the structure of each commentary and its essential constituents (Moustakas, 1994).

Results

Table 1 presents one example from each of the eight lecturers of what informed their practice; how this was evidenced in their pedagogy, and, finally, how ICT supported this practice. It was noteworthy that some lecturers stated what informed their practice, but in their response uncommonly provided no indication of how this was evidenced in their pedagogy and/or how this then was manifest in their ICT use. As will be discussed later, as commonly suggested in the phenomenology research literature, both the presence and absence of comment was important to us. The eight comments, one for each participant, provided an example of the categories identified in the cross-participant analysis. In all, we identified that the eight lecturers mentioned 26 influences informing their practice. These 26 informing practices were categorised as belonging to one of six different, yet interconnected, categories listed in column one of Table 2. These categories are (1) knowledge of PSTs' geographical location, (2) awareness of PSTs' likely limited formal tertiary education background, (3) knowledge of PSTs' social obligations, (4) awareness of PSTs' cultural knowledge as 'funds of knowledge', (5) knowledge of PSTs' literacy backgrounds and (6) knowledge of the hegemonic nature of schools as the environments PSTs' had experienced, were experiencing as PSTs and were likely to experience as graduate teachers. These six categories were, in turn, represented by 21 pedagogical practice comments and 62 ICT practice comments, both of which are listed in columns two and three of Table 2.

Although we could examine each of these sub-categories independently, we see it as more fruitful to present the interconnections amongst these themes. In our presentation of results we now focus on (1) how knowledge of PSTs and their immediate microsystem (family and community) and more distant macrosystem (state and national) influenced how instructors positioned themselves relative to PSTs and, subsequently, (2) how this influenced and was evidenced in their pedagogical approach, especially in regards to communication within the on-line environment and ICT use, an approach we refer to as contextually responsive technological pedagogical practices (CRTPP).

Knowledge of PSTs and Their Immediate Microsystem Environment Influences Pedagogy and ICT Use

Without exception, quickly into the interviews, and as we anticipated participants identified knowledge of learners and their contextual setting as major influences on how they as instructors approached their teaching. This identification immediately confirmed our suspicion that the TPACK model, which is commonly represented without overt attention to context, was indeed misrepresenting what knowledge informs teachers in their teaching, especially the decisions they make in terms of pedagogy. As well this identification affirmed Biggs' (1993) assertions that learning environment presage factors are antecedents for the instructional process. This knowledge included awareness of students' (1) social obligations, (2) geographical location, (3) literacy and linguistic capabilities, (4) limited prior tertiary experience and (5) socio-cultural-political background. This knowledge of learners and learner context was a primary determinant on lecturer pedagogy including ICT use. Each of these aspects will now be explicated in this section.

Teacher Educator	What Guides Your Practice?	How is this evidenced in your teaching?	How does ICT serve or support this mandate?
Polly	Awareness of the 'lived realities' of students as potential cautionary' 'risk' factors interrupting their learning – geographically isolated; inconsistent broadband access; social roles; time demands; multiple, complex and demanding social roles	Listen to students and be attentive and responsive to their situation, especially interruptions to their engagement, and respond accordingly and immediately; providing every opportunity for practice of Australian Standard English	Using multiple ICT options to engage with students – telephone conference, one-on-one phone conversations, emails, Collaborate™, well-structured materials. Adjust 'on-line' teaching and learning times with students' availability; anything that technologically mitigate the issues experienced by students
Matt	Being aware of the limited time available for on-line contact with students and the frequency of student on-line synchronous absence because of other life requirements	Focus on preparation of materials for the synchronous on-line sessions and to support students independent learning in the asynchronous on-line environment	Materials prepared provide for efficiency of teaching for the RATEP environment – making most of the time I have with students and the time students have for their learning. Posting web-links, preparing Power Point™, Collaborate™ and, especially, Adobe Captivate™ recordings that allow students to self-direct learning pace
Lynley	Being cognizant of Australian Standard English, often not student's first language Maximizing the interactions, especially with a literacy focus, I have with students in the on-line environment.	Selecting the technological mediums that best provide for interaction with students and language communication opportunity	The move from teleconference to Illuminate to Collaborate™ has increasingly provided improvement in interaction, especially in engaging with the reading, speaking, writing and listening skills.
Marvin	Using my knowledge of what contributes to learning for Indigenous students because of my own experiences as an Indigenous tertiary student	Making the learning environment a 'RATEP space' by using various approaches that try to accentuate this knowledge to foster student engagement, learning and positive experience	Highly visual environment encouraged which Collaborate™ allows in attempt to balance the aural and text driven nature of learning today. A very discursive, open and relational environment where we can be quite open and honest about being Indigenous. Using more comedy and 'Black' references
Ken	Awareness of a school system that needs to be challenged in terms of Indigenous education and seeing teacher education as emancipatory in providing the foundation for that change	Validating students' culture helping them to realize the significance they have in their roles as teachers. Critical conversations about the orthodoxy of the existing school system and national curriculum	Using visual resource material such as web-links to commentaries from communities (for example, YouTube™ on Daly River Pandanas Art Centre) about their cultural knowledge. Providing considerable 'wait time' and prompting to allow students opportunity to share orally of their experience from their community.
Sally	Background in teaching in special education and having a son who is disabled promotes understanding of difference and how educational programs may not cater to difference.	Bring knowledge of learning disability and knowledge of Indigenous communities together in my teaching – "putting it into their classroom. Not in a city classroom". I'm very practical so the subject is practical all the time, I don't go into a lot of theory. Use of scenario based learning that is related to their context. '	Use of PowerPoint™ in teaching using Blackboard Collaborate™. Allows students to review materials more easily than in a teleconference. On line, I am aware of time lag & making space for students to think. "As one of them said last week, 'I'm here but I'm thinking!'." Use of chat area helps here. "instead of answering me verbally, they'll type it in on the side'. Technology supports development of community of learners. Students use side conversations during class "and I didn't mind that because they're so isolated, and they're kind of making connections with each other, just like in tutorials".
Fish	Mindful of my own positioning. Through my reading, experience and conversations with colleagues, I can position my students and myself in our conversations. I'm very conscious of who I am teaching and how I am teaching	I do not set myself as an authority with RATEP students. Encouraging their participation in such conversations	Validating contributions by icons such as 'happy faces and 'applause'. 'Puzzled' face icon is purposely use to individually communicate that what I have to say is not the authoritative stance
Harriet	The need for an Inverted Curriculum in all I do, that is, ensuring that we ensure the curriculum is based upon the needs and interest of minorities, in this case our Indigenous students	The conversations and practices that occur within the RATEP space bring to the fore the prior experiences, current realities and future aspirations and potential challenges Indigenous students currently or, in the future, will experience.	The Collaborate™ sessions become an opportunity to consider these aspects, especially in a conversational manner. There's a level of conversation and consideration that can draw attention to these important matters, even though it's the same subject being offered to internal students. We can move beyond superficial conversations about education to focus on issues and concerns for them in their contexts. Providing time with the sessions for these discussions is essential.

Table 1: Participants' Views on Influences on Practice and Examples of Practice

Participants also made comment about RATEP PSTs' geographical location and the risk that was associated with this, especially in terms of on-line participation. Sally illustrated, "You're dealing with students in very isolated areas all the time. [PST] is on a property somewhere and [the network] is bad and she's gone off [line]. I can understand that when you are living in the middle of nowhere". Ken similarly stated, "Last week I didn't hear from someone; then this week again and then today there is an email to say she had to go home [for family matters] and that was a three day drive and no internet connection".

This mindset of consideration of PSTs' social obligations and geographical location displayed itself in a common action for instructors. They all expressed how this consideration influenced their need to provide support to students through a variety of measures. First, several mentioned that this awareness of obligation and commitment was something explicitly discussed in their initial and ongoing conversations with RATEP PSTs in their subject. As Marvin illustrated, "I let them know I am a person, not just a voice on-line. I encourage them to show their vulnerable side, when there [are demands], so we can get through this together". Similarly Sally commented, "I can understand where they are at. It does need to be hidden. They pick up on your experience and you're on common ground". As Ken mentioned, "Students are alone. They have limited contact with [colleagues], so this can make them vulnerable as there's not the support system there". Instructors referred to a variety of support measures, often associated with ICTs used to mitigate the negative influence of geography and social obligations. As Polly stated, "You can't be quick to judge. Behind every action [such as non-attendance] there is an explanation. You can respond positively [to absence] though". Instructors commonly mentioned practical steps they took to support students. They frequently made mention of sending emails and making phone calls, in all making effort to engage with students, especially if PSTs were perceived to be in a vulnerable position. As Ken stated, "It's easy to withdraw when you're isolated. If something gets inside [a PST's] head, sometimes the easiest thing to do is believe that no one's really caring for you".

Second, instructors commonly made mention of how they used ICT in a manner that supported them in achieving their practice goals, with reflective consideration of these contextual constraints. For example, Matt mentioned, "Your time with them is brief and you have to be prepared. Power Point™ presentations, website links, Camtasia™ recordings and especially Adobe Captivate™ are central to success. Their time is critical, and you have to make the most of it, and provide them with options to engage [possibly outside of synchronous communication times]". Matt went on to talk about ongoing RATEP ICT developments that allowed him to mitigate and overcome some of the problems associated with PSTs' ability to engage synchronously. "We now have multiple ways of presenting [material asynchronously], whereas in the past it was notes and a voice over the telephone. Effective teaching through RATEP takes work, especially in providing [students] with support because of their situation".

Participants acknowledged that their prior experiences with RATEP PSTs or through broader life experiences informed their understanding of geographical issues and the social obligations placing demands on RATEP students. As Sally identified, "The key is you enter [teaching in] this program [as an instructor] with a different mindset. Your prior experiences influence how you approach [your teaching]. That is the starting point. You recognize where people are at". Similarly, as Polly illustrated, "In my prior role, I gained considerable insight into the demands that are placed on [RATEP students], especially more mature PSTs because of their social obligations. If they are in the program, they likely have other very important social responsibilities as well. That is always at the forefront of your thinking". As Matt, summarised, "I've adapted things over the years, mainly being mindful of what works best in their [challenged] situation. We have many more [technological] options and there's a smile

on your face when you see something [technologically] working for them in supporting their learning on RATEP".

Influences on Practice (Frequency of Comment)	How this Influences Practice (Frequency of Comment)	How ICT Use Enables This (Frequency of Comment)
Knowledge of PSTs' Geographical Location (7)	Attentive to issues with internet reliability and isolation that reduces opportunity for collaborative discussion and collaboration (7).	Recording of Collaborate sessions (5) and production of Camtasia™ mini-lectures (2) for students' perusal outside of synchronous time. Ensuring wait-time because of lag in connection (3). Use of web-links for viewing media rather than through Collaborate (2).
Awareness of PSTs likely limited' Formal Tertiary Education Background (3)	Awareness that students are unlikely to have formal university backgrounds and thus need to be supported in their transition to university study (2). Explicit attention to methods that can support students in being successful (2)	Ensuring explicit attention in Collaborate™ sessions to the requirements for success (2). Detailed PP slides and commentary around subject requirements, timelines, useful strategies (2).
Awareness of PSTs' Likely Social Obligations (3)	Attentive to PSTs' family and community commitments and obligations (2)	Recording of Collaborate™ sessions (5) and production of Camtasia™ mini-lectures (2) for students' perusal outside of asynchronously. Flexibility for PSTs in assessment deadlines (2) and attendance synchronously (3)
Awareness of PSTs' Cultural Background as a "Fund of Knowledge (7)"	Recognizing that a culturally responsive pedagogy is necessary drawing from the strengths, values, beliefs and aspirations of students (5)	During Collaborate™ sessions, Instructor under-talks rather that over-talks (3), uses interactive resource material (3), emphasises an explicit instruction approach (3), but with much opportunity for dialogue (5), use of non-verbal visual prompts (icons) (3), prolonged wait-time encouraging response (2), use of humour (2) and personal narratives (3).
Awareness of PSTs' Likely Literacy Backgrounds (4)	Attentive to the potential underdevelopment of Australian Standard English and importance of students' English as dialectic as a first language (4). b	Challenging students to use Collaborate™ sessions as an opportunity to engage with ASL aurally and in writing (4). Explicit attention to literacy development in the subject and on-line forum (3)
Knowledge of the Hegemonic Nature of Schools (2)	Recognizing that the current education system and its curricula, both intended and hidden, is set primarily by a nationalist agenda, largely inattentive to Indigenous PSTs' and their communities aspirations. Explicit attention to this in teaching (2) and assessment work (1)	Use of resource material, including web-based media and other resource material that challenges the status quo (2). Providing opportunity through dialogue and assessments for critical dialogue and commentary around the hegemony of the existing social order (3).

Table 2: Categories of Influences on Practice and How this is Evidenced in Practice and ICT Use

Third, in addition to social obligations and issues associated with geography, participants often made reference to their knowledge and understanding of PSTs' tertiary background experience and literacy capabilities, perceived to be more limited relative to those of internal PSTs. As Marvin suggested, "I have had a similar experience. [I was the] first in the family at university. [Like I did] they need to be introduced to the style of education that takes place at university. It made me a vulnerable learner [like them]." Similarly, Harriet identified, "They just need to get a handle on the expectations of the depth required. [They tend] to write briefly and they need that support to extend their responses". As Lynley claimed, "They must develop that communicative competence [in Australian Standard English]. It is the foundation for effective teaching and [university] success so this needs to be modelled and encouraged." Apparent in these commentaries was the awareness of the imperative to assist PSTs in negotiating a new way of relating to and using language (Bourdieu, 1990; Halliday & Martin, 1993). This knowledge and understanding of student tertiary experience, especially in the need for communicative competence in ASE, which is pivotal to both academic and future professional success was again reflected in how ICTs were used. As Lynley asserted, "They are likely to prefer to express their responses [on Collaborate] in the chat box; but I get frustrated with that and say to them, if you want to be teachers, you've got to use your voice". Similarly Ken mentioned, "developing the science foundational knowledge is essential [to becoming an effective teacher of science] and finding a way to have them engage with this knowledge in the on-line environment is at the forefront of your thinking".

As well, instructor's commonly made reference to PSTs' cultural background as a "fund of knowledge" in informing their pedagogical practice. Funds of knowledge are

defined by Moll, Amanti and Gonzalez (2005) as "the historically accumulated and culturally developed bodies of knowledge and skills essential for household or individual functioning and well-being" (p. 133). Commonly evidenced in the participant's commentaries were how they recognized this fund of knowledge as a resource for supporting PST engagement and context for learning. As Lynley states:

> I build upon the prior knowledge of students. I am constantly using examples from their context that become the foundation for literacy development. Using the Collaborate™ sessions as effectively as possible to promote the variety of literacy skills we are focusing upon. This usually means using foundational experiences and contexts as foci for the use and practice of these skills. I use the 'break-out rooms' in Collaborate™ to provide interaction amongst students and then come back to 'main room' after these interactions.

Further, this 'fund of knowledge' was commonly identified as a foundation for informing pedagogical practice. Lecturer's commentaries indicated that they used PSTs' cultural knowledge, prior experiences, frames of reference, and performance styles of students to make learning encounters more relevant to and effective for them through the pedagogy used (Gay, 2000), which in turn was manifest in ICT practice. As suggested by Gay (2000) culturally responsive teachers teach to and through the strength of their students. The underlying premise of culture-based education is that the educational experiences provided for students should reflect, validate, and promote their culture and language. As Matt stated:

> I use strategies for instruction that support [these particular] student's engagement and learning. Materials used and the structure of materials is adapted to respond to the methods that assist [RATEP] students in their learning. Multiple representations are used to assist students in their learning of a concept. I try to be more open conversationally and physical 'space' is provided in both conversations and PP slides to promote student input in the learning sequence. It is essential I use a range of visuals especially alongside of words, symbols, and verbal analogies to get ideas across.

Marvin's comments provide evidence of lecturers' awareness that RATEP PSTs possessed a whole set of practices, beliefs, skills, and understandings formed from their experience in their world, and that their role as lecturers is not to ignore or replace these understandings and skills, but to recognize the teaching practices and understandings within the cultural context that affirm and build upon these understandings. In all, participants' comments, especially as evidenced in the number of comments and length of interview responses, indicated that their knowledge of PSTs and their contexts was the major influence on how they approached their teaching through RATEP. As Ken summarised, "I am aware of context. You're just aware of that [context] and that informs your practice".

Finally, instructors' contextual knowledge of PSTs immediate local community geography, prior tertiary education experience, cultural background and social obligations is extended and made more complex by their understanding of the larger macrosystem issues associated with Australian education and PSTs location within the larger microsystem. Instructors' knowledge of the hegemonic nature of education in Australia and PSTs past, current and future roles accentuated participants in assisting students in developing a critical awareness of its' functioning.

For example, when asked what informed her pedagogical practice, Harriet mentioned, "There is need for an inverted curriculum [in RATEP] in all I do; that is, ensuring that we ensure the curriculum is based upon the needs and interest of minorities, in this case our

Indigenous [RATEP] students". In turn she elaborated on how this was evidenced in her pedagogical practice and ICT use:

> The Collaborate™ sessions become an opportunity to consider these aspects, especially in a conversational manner. There's a level of conversation and consideration that can draw attention to these important matters, even though it's the same subject being offered to internal students. We can move beyond superficial conversations about education to focus on issues and concerns for them in their contexts. Providing time with the sessions for these discussions is essential.

Similarly, Ken made mention that:

> Students bring considerable prior knowledge into this subject and they have frameworks to call upon already, both for how teaching should occur and why teaching should occur – the purpose of education. The school system does not cater for this, and this needs to be challenged in terms of Indigenous education. I want students to be critical of this. It has to be a part of our [Collaborate™] discussion. I'll use images and other resource material to prompt this reconsideration and leave room for that discussion.

For both lecturers, knowledge of the existing social order of schools and the fact that RATEP PSTs will operate within this order in the future strongly influenced how they approached their teaching, especially in explicitly drawing attention to this reality and, in turn, using resource material to prompt critical discussion especially through the Collaborate™ forum.

Knowledge of PSTs and Their Environment Adjusts How Instructors Position Themselves

In all, it was evident that because of instructors' knowledge of PSTs' geography, social obligations and prior tertiary experience as well as PSTs cultural assets and location within a hegemonic educational system impacted on the processes enacted by both instructors and students in teaching and learning (Biggs, 2003). Instructors were shedding the traditional role of teacher and expert and, instead, positioning themselves in hybridized tripartite roles as *learners, facilitators* and, in some cases, *agents for emancipation*. Positionality is a commonly referenced construct in the social science literature. As Alcoff (1988) suggests positionality describes one's own social position in relation to the people one is working with. Positionality commonly situates race, gender, class, and other socially significant identities as markers of our relational position and is thus highly personal and contextual (Alcoff, 1988). In the teacher-student role of the RATEP context, instructors' positioned themselves differently and for different purposes. Evident within the commentary was evidence of instructors inverting the traditional instructor-student relationship by often positioning themselves as learners and students as authorities. As Fish asserted:

> We are positioned [as academics at this university] to be the authority of knowledge. And Indigenous students are positioned too, to not be very good at school. So, it's easy to fall into that discourse that [I] am the authority. I don't need [that] and I do not position myself to be the only person who has knowledge in that [web-based] room. In a subject like [Sociology of Education] much of the information is about them [as Indigenous people], so I don't generalize and I start with asking them as they are the authorities for their communities who have their

> own views on education. I look for them to share their knowledge. I don't make assumptions. I am careful how I position myself and them.

Fish's comments make apparent his efforts to ensure Indigenous PSTs are knowledge providers rather than passive recipients. This was also evident in Ken's comments.

> I am new here [in Australia] and this is not a culture I know. I know their culture has significant value and needs to be the foundation of their teaching, their professionality. You can't separate person from profession. I need to hear and learn to know of your culture. It's then when I hear of it I can assist you in ensuring it surfaces in your teaching. Your [future] students want that in their learning. You have the knowledge to be a powerful influence.

Similarly Fish stated,

> I do not set myself as expert. I use a 'pedagogy of uncertainty' to position myself as the non-expert. I am not the authority on knowledge. I will often use a confused face [icon] to communicate that I am not the authority on what knowledge is privileged or correct.

These descriptions give explicit evidence on how instructors positioned themselves in non-traditional roles relative to RATEP students as learners.This theoretical framing then influenced how the teaching-student technological interactive space is negotiated through each instructor's efforts, likely both consciously and unconsciously. As stated by Harriet:

> There are a variety of ways [I draw attention to the issues] including a 'tuning in' phase where we consolidate prior learning; then an 'extending' phase , especially by drawing from their past experiences in developing new understandings. [It's here we focus on] deep understandings about education because they require this for their communities. The technology becomes a means to ensure we can draw from those experiences and use them for foundations for our learning. Collaborate is good for this.

The facilitative role of educators was commonly evidenced in how instructors' emphasis on facilitating RATEP students in the knowledge, skills and, especially, procedural strategies that are necessary for success in a tertiary teacher education program. Drawing from Bourdieu's notion of 'capital', instructors identified the non-financial social assets that are likely to promote PSTs' tertiary education and teaching professional success. This is most evident in Marvin's comments where he positions himself as a culture broker; that is a person who facilitates the border crossing of students from their 'home' culture to the 'university' and 'teaching' culture. As suggested by Jezewski & Sotnik (2001) he mediates between students and university and the teaching profession for the purpose of reducing conflict and fostering success.

> Communication around those aspects of the subject that are potential barriers to success are identified and discussed within the Collaborate™ sessions. Attention early on in subjects to potential areas of concern, including making students aware of the need to not hide-away if something happens, like an illness. They need to know we can accommodate need for space and time if things happen. Students need to know we, as Indigenous people, are adaptive and that's what they will be experiencing in RATEP. As a culture we have always learned from each other and we will succeed this way.

Evident within Marvin's commentary was awareness of what contributes to tertiary success and the imperative for PSTs to 'code-switch' between home and university culture. Marvin's facilitative theoretical framing to promote transition to success is evidenced in a variety of his

colleagues' actions as well within the on-line environment. Instructors' practice frequently provided explicit attention to the development of, especially, the numeracy and literacy skills denoted as key foundational attributes or academic capital for success in university and the teaching profession. Matt states that "developing the [numeracy] knowledge and skills is pivotal to their success as teachers. There has to be that emphasis and I have to support that". Similarly Lynley states that:

> I provide as much space and opportunity as possible for me to include students. I need to learn about them and to establish a professional liaison because learning, especially literacy, comes from sharing of experiences in a variety of modalities, especially aurally. I try to talk less in Collaborate™ sessions and be more of a listener and try to be attentive to their concerns and requests.

In addition to the roles of learners and facilitators, some instructors less commonly positioned themselves as emancipatory agents for encouraging change. For example, in Ken's case, we saw evidence of his recognition of how science education traditionally privileges Western science and, by so doing, marginalises the validity and significance of Aboriginal ways of knowing. Recognizing that the RATEP students are unlikely consciously aware of this power relationship in science education, he worked within the technological space to foster critical consciousness and support RATEP students in drawing upon their 'funds of knowledge' in on-line dialogue. He states:

> As a critical pedagogue, the Collaborate™ space is used to pose problems and promote dialogue in a collective and horizontal relationship with students as subjects not objects. Practice is rooted in rationality and students are encouraged to look critically at the orthodoxy of science education practice and consider how this practice can be altered for the increased presence and participation of Indigenous students and the culture's they represent.

Overall, evident in the narratives of instructors was an awareness of their positionality relative to RATEP students, and how the theoretical frame of learner, facilitator and emancipator influenced their practice in the technological space of an on-line environment. Understanding the operation of the 'rules of the existing social order' were imperatives for instructors. Instructors approached their teaching and their students in an authoritative rather than authoritarian, manner, making clear, either explicitly or implicitly to their students, what is privileged and what knowledge or skills are necessary for success. By so doing, their pedagogical framing and practice indicated that PSTs were being encouraged to look beyond the personal to the political (Freire, 1970), a hallmark characteristic of culturally and contextually responsive pedagogy; a hallmark that was negotiated within the web-based environment through modalities provided by the technological space.

Positionality Influences Interaction, especially Communication and the Importance of Communication

It is not surprising that 'communication' was a prominent theme evident in the data, and this mention of communication was associated with the tripartite roles instructors assumed largely drawn from their knowledge, understandings and beliefs about PSTs. As Fish asserted, "RATEP is about conversations; it has always been about conversations". The instructor positions of learner, facilitator and agent for emancipation require a technological space that is, above all, dialogical rather than univocal. A dialogic forum was identified as the

space to optimise learning and this was afforded primarily by the Collaborate™ web-based forum. As Lynley identified:

> I try to ensure that the Collaborate™ sessions provide for a number of people interacting with any stimulus material at the same time. There are a variety of ways in Collaborate™ you can engage students' participation.

Further, Harriet identified:

> Before we had Collaborate™, we used to have teleconferences with the RATEP [PSTs], so having that ear-to-ear contact has always been a part of it. And I think that's been really important in that sort of two-way sort of learning [that comes from] that interaction between the academic and the student, unmediated".

Matt summarised the provision provided by Collaborate™:

> This is a RATEP space. It is about creating a [communicative] environment where open conversation is central to the learning. We address issues of concern, support each other in our learning and question what is [in education] and decide what should be. Creating that space through the technologies afforded is critical [to creating this space].

Because of the identified need for the dialogic space, there was little mention of, simply, content-delivery and, subsequently, the univocal stance such a teaching orientation encouraged (Straub, 2010). A range of ICTs were used for communication among instructors and PSTs, especially web-conferencing. Technology was embraced as the vehicle to facilitate interactions with students. Considerations about communication focused on how instructors could provide learner-centred activities that encouraged active and dialogic learning relationships with students. For example, although Power Point™ is commonly identified as a medium for content-delivery (Straub, 2010), it was commonly identified by instructors that it served as more of a focal point for providing initial information and, more importantly important, a prompt for discussion. As Matt mentioned:

> You have [physical] spaces in your [Power Point™] presentations. Those are places for the conversations. There are prompts. Maybe a worked example [in mathematics] or a URL, but this just is there to prompt that discussion. It takes that time to develop that structure. You're thinking about that [using the PP as a prompt for discussion].

Instructors viewed learning as very much a collaborative and conversational activity where learning from peers was encouraged. Each form of technology used was intentionally used as a foundation for discussion, not simply as a source of disseminating information. As Ken illustrated:

> The [Youtube™ clip] provided an example for what [Aboriginal community] had done, just to prompt [PSTs] consideration of why this had occurred. That provided the foundation for discussion. It was relevant and provided the foundation for a deeper consideration of how this topic might be addressed, especially in a critical way questioning how this topic might be addressed by [Aboriginal and Torres Strait Islander] PSTs.

Instructors with long-term experience in working in RATEP commonly mentioned how changes in technology had influenced aspects of teaching and learning, especially in supporting more discursive practices. As Matt identified:

> At one time [in RATEP PSTs] were left to their own devices to read things, and I don't think that's the best way to go with [PSTs], so

> since we've had the technology, we've tried as much as possible to do the recordings of lectures…. Try to have multi-representations, try to use as much as you've got available, visuals as well as audio.".

As technology changes occurred, this group of instructors appeared to use new developments in ways that evidenced their knowledge, understandings and beliefs about PSTs and the learning priorities such a context encouraged (Palak & Walls, 2009) and likely demanded. "Central to my work is providing that interactional support that works for learning but also supports them as individuals. You pick on new [technological] developments that promote that. That support is essential", mentioned Polly.

Reconsidering TPACK: A Summary

As mentioned earlier in this paper, although the TPACK framework has been used by researchers to ascertain the kinds of knowledge required by teachers to integrate technology in a dynamic transactional way, the context, unfortunately, in which the framework is grounded has not been a particular focus in research (Koehler, Shin & Mishra, 2012). Koehler et al. (2012) concluded that further investigation of TPACK and the contexts in which it is developed, should be an important dimension of future research, especially considering the ongoing influence of Biggs 3-P learning model (for example, Nemanich, Banks, & Vera, 2009), with its emphasis on presage factors which influence the learning environment prior to the learning engagement. This research draws attention to the imperative of this dimension in working with Indigenous higher education students in the on-line environment. Evident within the commentary about what informs practice for these instructors was a consciousness for teaching responsively, especially in attending to [PSTs'] culturally, geographical, academic, social and political backgrounds. It was clear that Pedagogical Knowledge of PSTs – that is, knowledge of the learner - strongly influenced instructor perceptions of their roles and this, in turn, influenced their practice, especially in ICT use. We infer from these data that at the forefront of instructors' thinking, likely more unconsciously than consciously, is knowledge of learners suggesting that the tri-centric planar TPACK model does not capture the way in which these instructors view their teaching by RATEP. As stated earlier, we hypothesised that this was the case and that knowledge of learners including their context was a foundation for how they viewed and made decisions about practice for supporting meaningful learning (Ausubel et al, 1968). We use the word view purposely because the knowledge of the learner and their context is the dominant and first-order lens influencing the actions of the instructors, especially in what technology they use and how they use that technology (TK). Further, this knowledge of learner also influenced content inclusion. Instructors indirectly made mention of content selection and inclusion, again primarily giving attention to how knowledge of learner influenced what aspects of content to privilege or to seek further understanding. As Matt mentioned:

> You have a variety of concepts to cover but you are giving attention in your decision to what can be accomplished [through technological considerations] and what is most important for [PSTs]. Decisions are made on that. There might be a range of [concepts] to be covered, but the selection is around that awareness. You are just aware of that.

In view of this research, we see the initial representation of TPACK problematic, which corresponds with others in their critical consideration of the model (Chigeza & Jackson, 2012). Our re-interpretation of TPACK (Figure 2), similar to Biggs' learning system model (1993) privileges the importance of presage with attention to context and learner, as one would expect based upon the long-standing imperative to focus pedagogic practice on a

knowledge of learners, including their context as a foundation for meaningful learning (Ausubel et al, 1968). In light of this shortcoming, and as affirmed by this study, if the model was to be re-represented, at the forefront, on the first dimension, would be consideration of context and knowledge of learners within this context. In contrast to the reference to context in the TPACK literature which is generally 'ambiguous' and fraught with 'multiple meanings' this study elaborates on the multidimensional knowledge base of students (geographical, linguistic, political, cultural, and social) that informs educator consideration. Absent from any of the literature is indication that this knowledge of learner then influences a second dimension, likely unconsciously, the role they adopt as instructors. Knowledge of context and learners prompts instructors to consider their role in working with RATEP learners. In adopting hybridised roles as learners, facilitators and/or agents of emancipation, their ICT use ultimately reflects this tripartite role. This, then, ultimately influences technological selection and use, as represented by the third dimension of the model. In essence, we have inverted the TPACK model privileging the background of "Contexts" as we illustrated initially in Figure 1. Repeating Harriet's claim, "There is need for an inverted curriculum [in RATEP] in all I do; that is, ensuring that we ensure the curriculum is based upon the needs and interest of minorities, in this case our Indigenous [RATEP] students".

Despite the contribution participants' comments have in causing us to reconsider the TPACK model, concerns arise from the narratives from participants. Three things were of central importance.

First, instructor's perceived roles influenced their practice, especially their ICT use and, in some cases, in a limited way. For example, if instructors saw their role as agents for emancipation, their practice was largely dialogic and limited to the synchronous space making little use of communication systems such as asynchronous possibilities such as Camtasia™. Similarly, if instructors saw their role as learners they again relied, often exclusively, on the synchronous dialogic space provided by Collaborate™ or the use of Power Point™ to promote a dialogic forum. It is our estimation that a tripartite role encourages instructors to select and use technology broadly.

Further, although all participants advocated for a discursive learning environment, only a few participants made mention of a wide range of mediums used in their instruction, especially in the interactional dialogic space. That is, it was apparent that some instructors had more limited technological knowledge and technological pedagogical knowledge which restricted how their roles and communicative aspirations were likely diminished by their TK capabilities and practices. Of particular importance to us was the difference in degree to which participants actually referred to ICT use in their deliberations. It was clear that developmentally some instructors used a much more complex range of practices.

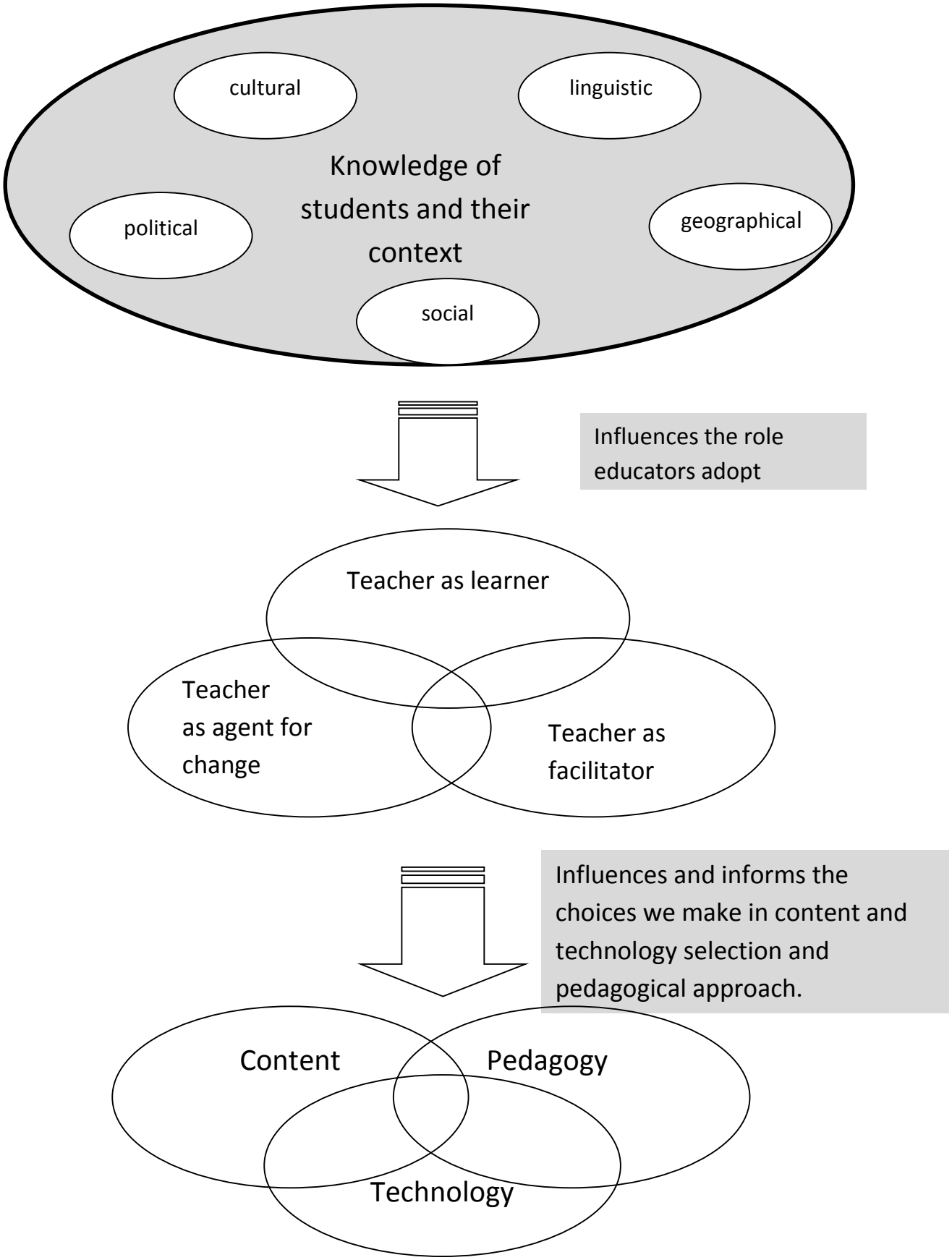

Figure 2: Reconsidering TPACK

Finally, we saw evidence that a wider knowledge base of the characteristics of learners contributed to a broader range of pedagogies used. For example, Polly's awareness of a PSTs absence was likely attributable to some of the pragmatic concerns that are symptomatic of all RATEP students (such as social obligations) automatically promoted her attention to asynchronous ICT formats such as Camtasia, a response she indicated was not a similar response for her internal (face-to-face) PSTs in the same class.

From these accounts, we identify a fundamental concern with the TPACK model, as exposed by the research participants and alluded to in the literature. It is our belief that the TPACK model places inadequate attention on learner and context and, instead, underestimates the importance of being mindful of context and the manner in which knowledge, understandings and beliefs inform practice. This underestimation, we see is an inexcusable oversight in the model. To us, more important than expertise in content and pedagogy is the adoption of an active position of critically assessing student needs in context and adapting teaching accordingly (Banister & Maher, 1998).The instructors in this research provide awareness of this active position through what Harriet refers to as an inverted curriculum (Connell, 2007). As she states, "all consideration about teaching [in RATEP] is based upon [knowledge of students]. All consideration for program improvement must be framed by that consideration". It is our estimation, that our RATEP instructors are grounded in such an imperative, even though the TPACK model, as it is commonly presented, illustrates little imperative for such.

Summary

The study described in this paper focuses on reconsidering TPACK as a response to the instructional experiences of instructors within the RATEP program. As stated earlier, the TPACK model explicates the importance of the triadic relationship between technology, content and pedagogy in the identification of pedagogical content knowledge (PCK), Technological Content Knowledge (TCK) and Technological Pedagogical Knowledge (TPK). More importantly and evidenced from this study is that the importance of this triadic relationship is secondary to an understanding of learner and their context – academically, geographically, linguistically and politically – and an awareness of the roles teachers adopt in response to this understanding. TPACK is likely to have more significant application if educators individually and collectively first consider presage or learning environment factors, especially characteristics of learners as culturally located individuals. Then, educators should consider *what* they seek to accomplish giving consideration to *why* they seek such aspirations. From this informed stance teachers can then consider *how* what they seek to be accomplished can be accomplished through the technologies available using this understanding to develop appropriate, context-specific strategies and representations" (Mishra and Koehler, 2006, p. 1029).

By so doing we now in our work draw attention to the undeniable pre-eminence of context in informing dialogue, decision making and professional learning and development for instructors in RATEP. Ultimately we seek to prompt "reflection and action upon the [ICT] world in order to transform it" (Freire, 1970, p. 123) recognizing that a uniform application of TPACK likely needs further consideration especially in non-mainstream contexts, such as RATEP. A Contextually Relevant Technological Pedagogical Practice is demanded by non-traditional settings and students. Such students and practices are not served well by a traditional TPACK frame until context is first considered. Non-traditional students' educational success in the on-line learning environment can only be better supported through an understanding of context.

For those currently involved in RATEP, because we have reconsidered TPACK and placed pre-eminence on context, we can now reconsider in a dialogic forum our technological practice. In this dialogic space we will be encouraged to share our knowledge of learners and our beliefs about our roles as teacher educators. We will be encouraged to be learners, facilitators and agents for change, all in response to improving the educative experience provided for PSTs who study through RATEP.

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