Conference Proceedings of the Australian Computers in Education Conference 2014

Welcome to the conference proceedings for ACEC2014

The ACEC2014 Now IT's Personal conference explores the three themes of Innovative Learning, Inspiring Leadership, and Redefining Education. The conference has been organised by EdTechSA (formerly CEGSA) for, and on behalf of, Australian Council for Computers in Education (ACCE). The Conference Program Chair Dr. Trudy Sweeney together with Program Executive Sue Urban have edited the proceedings.

The first iteration of the conference proceedings is on USB and available to all delegates on the first day of the conference. After the conference the ACEC2014 website will be available as an "up-to-date" conference proceeding.

All reviewed papers for this conference have been "full paper, double/blind" refereed, and the editors would like to thank all of our reviewers for their time, energy and dedication to the task.

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PERSONALISING THE PROFESSIONAL LEARNING JOURNEY

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Abstract

Professional development activity is widely accepted as a means of effecting change and as such IT-related professional development has been recognised internationally as a key factor in helping teachers acquire IT proficiency. However, neither mandates for the integration of IT in education, nor the range of professional development activities available to teachers appear to have significantly impacted on the way or frequency with which IT is used in our schools. There is a significant body of literature attesting to low qualitative and qualitative use of IT and evidence suggests many educators are reluctant to embrace the potential afforded by digital technologies. Empirical evidence has already established the significance of beliefs for understanding teachers' behaviour. Given this strong link, it is curious to note that most current forms of professional development neglect to acknowledge the 'mental lives' of participants and remain largely transmissive and impersonal in style. This paper draws on a longitudinal action research study in which participants' 'mental lives' were revealed and explicitly addressed in order to support their IT use and integration into the classroom. An alternative model for professional development that acknowledges and responds to teachers' thoughts and feelings is advocated.

Introduction

There is a silent epidemic in our classrooms… *IT* works in mysterious ways, sometimes undermining teachers' confidence, threatening their sense of self-efficacy and making them feel Dickensian and out of step with twenty-first century learning. *IT* preoccupies their thoughts and renders many frightened to speak up. Others will take little notice of *IT*s symptoms and carry on as usual. Regardless of their symptoms, few sufferers will talk about *IT*. The classroom epidemic to which I refer is that of teachers' fear of using *IT* in their classrooms. Fortunately, the epidemic isn't life threatening. A treatment option is available, it works and it is needed urgently!

Background

In my work as a researcher, I ask teachers about the ways in which they incorporate IT into their classrooms. Often my question is met with rolling eyes and an awkward, almost apologetic laugh. Some will confess they don't use *IT* much because they don't know how or because *IT* scares them. Others admit to using *IT* for simple tasks like word processing and accessing information. These teachers' anecdotes are supported by a body of literature that attests many educators are reluctant to embrace the potential afforded by digital technologies (Ertmer & Ottenbreit-Leftwich, 2010; Groff & Mouza, 2008; Levin & Wadmany, 2008; Pegg, Reading, & Williams, 2007; Sutherland, Robertson, & John, 2009; Voogt, 2008) or they use it infrequently in low-level ways (Ertmer, 2005; Jamieson-Proctor, Burnett, Finger, & Watson, 2006; Leung, Watters, & Ginns, 2005). This damning claim is despite education department mandates and government policy advocating IT integration and widely accessible IT-related professional development activities. How then can this be?

An education system that embraces new technologies presents a myriad of possibilities, options, dilemmas, and challenges for teachers. Professional development activity is widely accepted as a means of effecting change and a key factor in helping teachers acquire IT proficiency (Phelps, Graham, & Kerr, 2004). However, despite an array of teacher professional development programs over the past 20 years, Jamieson-Proctor & Finger concluded these efforts "have not empowered teachers to have the confidence and skills necessary for them to transform their pedagogy…." (2008, n.p). Ramsey's (2000) observation that IT was "one of the most significant challenges confronting

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teachers' education, teachers and schools (p.68) appears still to be very relevant and challenges researchers and professional learning facilitators to remedy the problem.

According to Levin and Wadmany, "teachers are key players in changing the educational world, and in particular the learning and teaching processes in their own classrooms" (2008, p. 234). Ineffective professional development that fails to support teachers' adoption of IT has led to a situation where the extent to which new technologies will be integrated or adopted hinges on teachers' thoughts about, "if, when and how this can be done" (Bate, 2010, p. 1042). Thus, it might be argued that teachers' beliefs about IT are a more powerful predor of their preparedness to change, rather than policy mandates. Accepting this position implicates those concerned with raising the depth and frequency of IT use to listen to and consider teachers' thinking as an essential part of the professional learning for change equation.

Senge (1992) suggested that failure to appreciate employees' mental models has undermined many efforts of reform because "mental models shape how we act" (p. 5). Blackberry (2012) used the term 'mental lives' to describe the relationship between teachers' thinking (cognition) and affect (feeling). She suggested an individual's 'mental lives' included well-researched constructs like attitudes, beliefs, fears, perceptions, motivation, self-efficacy, confidence, self-esteem and personal knowledge. The link between teachers' 'mental lives' to change is well documented (see Ertmer & Ottenbreit-Leftwich, 2010; Phelps & Graham, 2008; Phelps, Graham, & Kerr, 2004). Luke argued that in the process of acquiring new knowledge and skills, firmly held attitudes and beliefs may be challenged and cause unavoidable dissonance leading to a rejection of the change (as cited in BECTA, 2004). Given the strong empirical links between teachers' beliefs and their IT practices, it seems incongruous that they are rarely acknowledged or considered in IT-related professional learning models.

Diagnosing the 'ailment': professional development

Most professional development initiatives (IT-related or not) remain largely transmissive style workshops focused on skill adoption and 're-tooling' (Jamieson-Proctor & Finger, 2008; John, 2002; Meredyth, Russell, Blackwood, Thomas, & Wise, 1999). Operating from a deficit perspective, this type of professional development treats teachers as passive receivers of knowledge delivered by an "expert" who is often an outsider (Knowles, 1973). There is often little or no differentiation in content or presentation to account for participants existing knowledge and skills. The "working on" model (Tafel & Bertani, 2008) is highly inadequate in the context of rapidly changing technology. It does not give participants the skills to transfer their knowledge to new technologies or situations and it neglects the multidimensional nature of change including the explicit acknowledgement of teachers' attitudes and beliefs that is considered essential by Ertmer (2000, 2005), Ertmer and Ottenbreit-Leftwich (2010), Guskey (2002), Loveless (1995), and Phelps, Graham and Kerr (2004). Only a few IT-related professional learning programs for teachers that consider teachers' attitudes and beliefs are in fact documented in the literature (McNamara, Jones & McLean, 2007; Phelps et al., 2004; Reading, 2010). Difficulties arise when teachers' beliefs about change and the need for change do not align with what they are being asked to do (Guskey, 2002). Consequently, "new insights fail to get put into practice because they conflict with deeply held internal images of how the world works, images that limit us to familiar ways of thinking and acting" (Senge, 1990, p. 174).

Treating the 'ailment'

In contrast to the knowledge-transmission approach, a reforming (Smith, Hofer, Gillespie, Solomon, & Row, 2003) or learner-centred approach to professional learning has been shown to effect change in teachers' practices and is driven by a philosophical orientation about the purpose of professional development as being about teachers changing rather than just adopting new techniques (Smith et al., 2003). Evidence suggests professional learning experiences that are grounded learning that is active, authentic and collaborative are more successful than the transmissive approach (Knowles, 1973; Kagan, 1982; Laferriere, Lamon, & Chan, 2006). The 'deep learning' and transferability of skills

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inherent in such grounding enables teachers to develop lifelong learning strategies (Hoffman, 1986). 'Deep learning' comes from "an ecology that grounds teachers' learning experience in their open practice, experience and culture (community)" (Laferriere et al., 2006, p. 78). In addition, Tafel and Bertani (2008) acknowledged the influential nature of beliefs upon teachers' behaviour and advocated professional learning facilitators acquaint themselves with participant's beliefs in order to manage the change process more appropriately and respectfully for them.

Purpose

Three overarching questions guided this inquiry.

- What were our mental lives about IT at the beginning of the inquiry and how did our mental lives impact upon the process of acquiring new knowledge about IT?
- What impact do our mental lives have on our adoption of TPACK and constructivist pedagogies?
- What features of action research facilitate the identification of teachers' mental lives and contribute to their development of TPACK?

Methodology

Five teachers (three from an independent primary school in Brisbane, one kindergarten teacher and myself) formed a professional learning community (PLC) with the intention to develop our knowledge and classroom practice with IT. Each participant (myself included) confessed to reluctantly using or proactively avoiding using IT in the classroom. In addition, I was the PLC mentor. An action research approach framed our professional learning. The constructivist, interpretivist, and non-positivist principles (Cardno & Piggot-Irvine, 1996) underpinning action research supported an approach to the teaching and learning that was personally relevant and meaningful to each of us. Our first action cycle involved planning for and implementing the use of some technology in a unit of work for our classes. Critical reflection occurred simultaneously to teaching the unit and immediately following completion of the unit. Arising from the reflection, modifications to the original plan were made in an attempt to strengthen the work or eliminate problems we had encountered. Two teachers from the primary school left our PLC after the first cycle citing health reasons. The remaining two teachers, Amanda and Dee continued to work through five action cycles with me for a further two and a half years. Both Amanda and Dee were experienced teachers. Amanda had been teaching for over 12 years and Dee for over 40 years at the time we began working together. I had worked intermittently as both a secondary school teacher and a journalist for 20 years.

The data reported in this paper were collected from the last five action cycles. Evidence was drawn from planning meetings and classroom observations together with emails, professional and personal conversations and reflections. The accuracy of data and authenticity of our voices were major considerations, thus member checks with Amanda and Dee formed an important part of the data collection process. The data were transcribed and using NVivo software, coded inductively and analysed for themes.

Findings and discussion

Our findings related to how our mental lives impacted our use of IT were consistent with a voluminous body of literature that has concluded our actions are determined by our thinking. Thus, because we all had reservations about using IT, we tended to use it reluctantly or avoid it altogether. For further discussion of this see Blackberry (2012). An unanticipated outcome from the action research was the evolution of a new model of professional learning that is the focus for the rest of this paper. The model, 'Turning Teachers On to ICT' depicted in Figure 1 evolved from constant comparison analysis of the data. It is a holistic approach to professional learning that makes explicit

the features of action research that supported our IT practice changes whilst simultaneously acknowledging the impact multiple ecologies had on us as we strived for integration.

Microsystem

The model suggests the most powerful influence over our actions occurs at the microsystem level. That is, our thoughts and feelings directly impact our actions. While many teachers are able to perceive the need for change and initiate it without the support of other systems, other teachers' thoughts and feelings may function to prevent the adoption of changes in practice (see Pegg et al., 2007; Tafel & Bertani, 2008).

We all fell into this category and needed support to restructure our existing cognitive and affective representations. Although we understood its potential, our thoughts and feeling about IT prevented us from making significant changes to our practice. We were also united by a common fear; how to use IT. Amanda was worried about not knowing how to create an animation and the time it would take while Dee and I were concerned about using IT in educationally sound ways. The model acknowledges the centrality of our mental lives in guiding our action, and in our case, they were powerful determinants of our inaction. In order to be able to change our thoughts and feelings, we needed to acknowledge them, talk about them, identify their origins and reflect on how they prevented us using IT. We did this in our 'conversation space'.

The conversation space and reflection

Our thoughts and feelings often remain tacit and invisible to others unless they are challenged. We
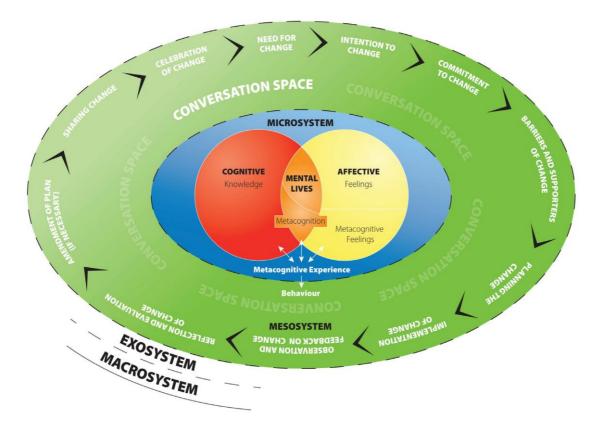
Figure 1. Turning Teachers on to ICT Professional Learning model

utilised the conversation space, a metaphor for the situated, sustained dialogue and reflection that pervaded the action cycles, to challenge our thoughts and feelings. Metacognitive processing and substantive reflection were powerful agents supporting the

change process.

> *Metacognition has allowed me to see that uncertainty has characterised much of my thinking but that it has been practice and reflection on that practice that has allowed me to replace uncertainty with new knowledge. If we don't challenge our thinking, how can it change and develop.* (Gina)

Dee summed up the significance of reflection and conversation for her saying:

> *To be willing to shift one's thinking, through personal questioning, research and reflection, empowers unfolding growth and development and my ensuing conversations with Gina, as we shared conversations around children's learning, technology and her own studies, began to provoke my thinking about the possibilities of technology as a valuable tool and process for education and for learning.* (Dee)
> *The process by which I was simply allowed to think out loud, to express my fears and concerns and to talk them through until they no longer served as roadblocks, was a great learning experience. I came to realise that I had nothing to fear from technology and that I was as capable as anyone else in playing with it and coming up with meaningful ways to use it to support my teaching and my students' learning. I expressed my frustrations to Gina. And, I have to say, just having someone I could do this with was a blessing in itself. Being able to talk it out gave me the clarity I needed to know I could change things for myself and for my students.* (Amanda)

As we worked through the classic action cycle of plan, act, observe, reflect and revise (Zuber-Skerritt, 2001, p. 15) the conversation space also functioned as an information exchange that became the platform for identifying and addressing concerns, negotiation and personalising the learning process. The conversation space also helped us to articulate which steps supported our attempts at change. These concepts, we called 'action steps' emerged during data analysis.

Mesosystem

At the outer edge of the ellipse, the eleven action steps identified in the data as supporting our planned change are indicated. These extend on the five traditional action research steps outlined above. The arrows indicate the movement of our action through various 'action spaces'. While the model suggests these 'action spaces' occurred sequentially, as we moved through cycles we found we sometimes skipped an 'action space'. The ability to move in any direction around the model is suggested by the space above and below the arrows.

Three behaviours, supported by the conversation space, underpinned these action steps and were found to be critical to supporting the change process and restructuring our mental lives in relation to IT. Our data suggested intention/commitment, mentoring/collaboration and observation/reflection pervaded all our work.

Intention/commitment

Policy and school directives suggested we all had a reason to make changes but as this inquiry demonstrated these directives did not translate into action. We found many obstacles that prevented us from initiating IT use and integration independently. These barriers included: time, resources and our mental lives. We were cognisant of the fact that we didn't know how to and this made us feel uncomfortable. It was important for us that we recognised it was in our best interest to make changes and this was accompanied by an intention to make changes.

> *My own professional growth had led me to consider, wonder about, read and explore the growing relevance of ICT in early childhood classrooms over the span of my professional career. Keen to find a strong foundation on which to rest the use of ICT in my classroom setting to achieve meaningful and credible learning outcomes for children, my*

relationship with Gina emerged. When we commenced the process, I was scared... scared of what I thought I couldn't do and needed to be able to do to make the learning rich and interesting. My (natural) fear was also accompanied by an excitement that, here, I had a valuable opportunity to work alongside another professional. (Dee)

Amanda's intention to change was supported by evidence she had that indicated her students were not engaged and motivated. *"I've also got to have a reason to do it... there has to be a reason to take on the next challenge."*

A commitment to change represents a deep shift in the level of seriousness with which the challenge is taken. When the commitment is explicitly stated, in particular to the mentor, there is a concomitant shift as the participant accepts a degree of accountability for their engagement in and actions during the action cycles.

> *Having Gina checking in regularly, demonstrating a keen interest in what I was doing and questioning me, challenging me and encouraging me, was what held me accountable. It is one thing to hear of particular programs or websites and tell yourself that one day you will get around to exploring them in more details, but quite another to actually tell someone else you will do   it and then have that person check in with you in a week's time to see how it went. That accountability was a key issue for me, particularly in the initial stages. (Amanda)*

Mentoring/collaboration

Teachers often work in isolation and are frequently expected to implement change independently or with minimal support. Our action cycles valued mentoring and collaboration as a means of continuous, authentic and contextualised support.

> *Two heads are better than one. With Gina as my sounding board, cheer squad and mentor, I began investigating other ways in which I could incorporate ICT's into my classroom. Having her checking in regularly, demonstrating a keen interest in what I was doing and questioning me, challenging me and encouraging me, was what held me accountable. (Amanda)*
> *She was a generous, resourceful and enthusiastic mentor. She was willing to listen and was capable of extrapolating our differing capabilities, roles and responsibilities and our need for provocation. She led by example and was aware that each of us would engage as and where we were able, available and interested. (Dee)*

Observation/reflection

Watching students work with computers and their seeming enjoyment and comfort in doing so, was a powerful agent of change. Our observations of their capabilities, together with their motivation and enthusiasm provided us with new evidence which directly contradicted Amanda's early claim that, "the students will require a lot of support to do that" (ie. work with computers to create an animation). During cycle two, as a result of using technology-mediated pedagogy, a WebQuest, Amanda observed positive changes in her students' motivation and   their ability to work independently.

> *Today I must admit I'm very excited. I just love not having the kids in my face every five minutes and feeling frustrated. The students responded so positively to doing a WebQuest. I originally thought it might just be the novelty of using the computers but I tell you what, after seven weeks the novelty of using computers has worn off so something else must have been keeping them motivated and on task. I did not expect to have some students where they're at today. And they're excited and you know that's the best thing is that they're loving it. Before the students seemed to lack any sort of engagement with the topic. (Amanda)*

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These positive perceptions permitted Amanda to revise her beliefs about a range of IT related issues she formerly held and supported her to continue with IT integration.

Exosystem and macrosystem

The exosystem and macrosystem are positioned at the outer edge of the model because for us, they exerted the least influence on our IT practice. Government mandates and educational department policy directives had failed to shift our thinking and increase our IT use.

Conclusion

The nuanced and highly personal lives and contexts within teachers' work deserve a form of professional learning in which the individual is valued, understood, and supported to make change possible. This study has highlighted the need for teachers' mental lives to be made visible and that the interplay of the meso, exo, and macrosystems of their work environment must be investigated and addressed during any ICT-related professional learning experiences. A mesosytem that is able to challenge teachers' mental lives and support them through experiential and situated learning is needed to make teachers' learning personally and professional relevant and to address the malady of IT integration in our schools.

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