



The beliefs behind the teacher that influences their ICT practices

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ABSTRACT

This paper explores teacher beliefs that influence the ways Information and Communications Technologies (ICT) are used in learning contexts. Much has been written about the impact of teachers' beliefs and attitudes to ICT as 'barriers' to ICT integration (Ertmer, Ottenbreit-Leftwich, & York, 2007; Higgins & Moseley, 2001; Loveless, 2003). This paper takes a closer look at the types of beliefs that influence ICT practices in classrooms and the alignment of these beliefs to current pedagogical reform in Australia. The paper draws on data collected through the initial phase of a research project that involved an Industry Collaborative of four Catholic primary schools (prep – grade 7). Data are drawn from teacher surveys, interviews and document analysis. The results present specific links between ICT beliefs that are informing teachers' practices. ICT beliefs and practices are aligned to reform agenda for digital pedagogies. The findings of this research inform teacher ICT practice and requirements for ICT professional development.

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1. Introduction

It can be simply stated that teachers' pedagogical beliefs affect their teaching behaviours in the classroom (Bandura, 1986; Clark & Peterson, 1986). With the advent of Information and Communications Technologies (ICT) in education, teachers form their own beliefs about the role of ICT as a teaching tool, the value of ICT for student learning outcomes and their own personal confidence and competency. These beliefs intersect with teachers' established pedagogical beliefs. This intersection can be a 'collision' or 'collusion', both having implications on how ICT is used in the classroom, as an add-on to established curriculum practices or as a tool that effects change in their practice (Prestridge, 2007). Teachers are likely to plan and implement practices with technologies that reflect their beliefs about teaching and learning (Drenoyianni & Selwood, 1998).

Teacher beliefs have been identified as a 'second-order' barrier to the integration of ICT in teaching and learning (Ertmer, 2005). First-order barriers are extrinsic to the teacher and include lack of resources, time, access and technical support. As part of current educational reforms, such as The Digital Education Revolution 2008–2011 in Australia (Department of Education, Employment and Workplace Relations (DEEWR, 2009)), The National Education Technology Plan in America (U.S. Department of Education, 2006) and the Every Child Matters programme of change in the United Kingdom (Department of Children Schools and Families (DCSF, 2009)) technological infrastructure such as broadband internet, as well as new ICT equipment, online curriculum resources and ICT training for teachers is being delivered. Regardless of place, sentiment such as this is leading these reforms:

'Australia will have technology enriched learning environments that enable students to achieve high quality learning outcomes and productively contribute to our society and economy' (DEEWR, 2008, p.4).

First-order barriers, consequently, are being overcome. Teachers are gaining access to ICT, professional development is available, and digital curriculum resources are accessible and are continually being developed – the digital classroom is a reality. However, teachers' ability to use these digital tools in their classrooms, that is, the digital pedagogies required for the effective implementation of ICT, have not been adopted by the majority of teachers (Scrimshaw, 2004) and there still exists a division between the input of the early adopters and the reality of a more widespread implementation of ICT (Watson, 2006). Tondeur, van Braak and Valcke's (2006) research on the

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impact of a national curriculum on the use of ICT in primary schools found that Flemish primary school teachers still stress, to a large extent, technical ICT skills. Smeets (2005) also argues that current ICT integration in Dutch primary schools reflects traditional pedagogical approaches that emphasise skill-oriented instructional use of ICT. Similarly, evident in Prestridge's (2007) examination of curriculum reform in Australian primary schools, the majority of teachers were expected to reach targets aimed at augmenting the existing curriculum, in other words, adding-on ICT or assimilating ICT as traditional teaching that has been technologised (Lankshear & Bigum, 1998). The Digital Education Revolution in Australia is a response to the finding that even though most teachers and students benefit from access to computers and online resources 'only a minority are reaping the benefits of the information technology revolution' (DEEWR, 2008, p. 3) by using digital pedagogies.

Current reform agenda in Australia suggests a 'meaningful change to teaching and learning' described as 'student centric programs of learning' that 'employ contemporary learning resources and activities' (DEEWR, 2008, p.4). Student-centred activities that utilise digital resources can be described as 'Digital pedagogies' – teaching and learning practices that engage with digital technologies. Exemplary teachers who embed ICT in a seamless fashion have been defined as those who use ICT in learner-centred constructivist environments as opposed to traditional teacher-directed environments (Ertmer et al., 2007). This does not imply that direct instruction is not appropriate, as Gibson (2001) points out that the most effective learning environment is 'that in which the teacher, the facilitator, the guide, the instructor is capable of selecting the most appropriate strategy', knowledge instruction or knowledge construction, and that ICT must be 'transparent to the learner and allow for ubiquitous learning opportunities' (p.56). Consequently, if teachers are required to implement the kind of pedagogical change indicated in current educational reform agendas, professional development programs must look beyond first-order barriers to the intrinsic, more complex second-order barriers of teacher beliefs and how they influence ICT implementation in the classroom. This paper provides an examination of teachers' pedagogical beliefs about ICT that inform their classroom practices in the context of digital pedagogies.

2. Theoretical framework

This section will explore theoretical underpinnings in regard to teacher beliefs followed by a review of the literature linking teacher beliefs and ICT practices.

2.1. Teacher beliefs

As beliefs are implicit, unobservable and complex in relation to what one knows and what one actually believes, both the labels and the definitions of teacher beliefs used in the literature are diverse and difficult to define. However, specific ideas from a substantive body of knowledge about teacher beliefs are evident to help us to understand and deal effectively with the complexity of beliefs. Firstly, Calderhead (1996) distinguishes between what would constitute as knowledge and what would be considered a belief. Beliefs are generally referred to as "suppositions, commitments and ideologies" whereas knowledge is referred to as "factual propositions and understandings" (p.715). In the case of teacher beliefs about ICT, for example, knowledge of a blog and how to blog, and even knowing other teachers who use blogs in their practice, does not mean that a teacher will believe that blogs are a beneficial tool for use in their classroom. Knowledge is external to the self, in the sense that it requires evaluation or judgement to reach a consensus. Whereas, beliefs are formed by non-consensus, they stem from affective feelings and emotive evaluations as well as personal experiences, which are not open to outside appraisal or critique (Pajares, 1992). Consequently, as suggested by Nespor (1987) beliefs are far more influential than knowledge in influencing behaviour. The important question now becomes "how to change a belief?"

Rokeach (1976) talks about the strength or stability of a belief by its positioning in the belief system. The more central a belief is within what he calls the 'central-peripheral dimension' (p.13) as well as the more connections it has with other beliefs indicates the less this belief is likely to change. This idea suggests that beliefs are established during earlier experiences and become stronger over time as they are used to process subsequent experiences (Pajares, 1992). Nespor (1987) suggests beliefs gain their strength from their 'unboundedness', meaning that the connection a belief has with another is highly variable, unpredictable, unstable and uncertain, indicating that there is no clear logical rule for the connection. On top of this illogical formation, the linkages are bounded up with emotional and personal experiences. This premise suggests that teachers' beliefs vary in strength and kind, and the ease with which teachers change their beliefs is related to the strength of the belief under challenge.

Pedagogical beliefs are formed over many years of experiences, from life as a pupil in the classroom (Keys, 2007; Richardson, 2003) to the variety of professional context teachers encounter. Because of this, beliefs can be resistant to change. Long-standing beliefs are supported by strong authority and broad consensus (Albion & Ertmer, 2002). However, even though beliefs are not easily changed, it does not mean that they cannot be changed. According to Nespor (1987) when beliefs change, it is more likely a conversion or a Gestalt shift, rather than as a result of a marshalling of evidence. Like the visual experience of seeing one-way and then another, the shift is instant but may shift back unwillingly. In the context of teacher change, successful professional development promotes making conscious teachers' pre-existing pedagogical beliefs for interrogation and reformation through the program. A focus on the second-order barriers of teacher beliefs is evident in literature associated with professional development including that related to the integration of ICT (Ehman & Bonk, 2002; Eib & Cox, 2003; Kagan, 1992; Prestridge, 2007; Shriner, Schlee, Hamil, & Libler, 2009; Windschitl & Shal, 2002; Wideen, Mayer-Smith, & Moon, 1996). Further discussion of the relationship between beliefs and practices specifically related to ICT is now required.

2.2. Teacher beliefs and the link with ICT practices

Teacher beliefs about learning and teaching are critical factors in how ICT is actualised in the classroom (Becker, 2000; Cox et al., 2004; Orlando, 2009; Wozney, Venkaterinesh, & Abrami, 2006). The relationship between teachers' beliefs and the integration of ICT has been explored in the literature. Loveless (2003, p. 323) in her research of primary teachers' perceptions of ICT and their pedagogy, found that

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