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Using a design based research approach to explore the ways that primary school teachers conceptualise authentic learning: A work in progress

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Abstract:
This paper reports on the use of design based research (Reeves, 2006) as an approach to conducting research for a doctoral thesis. The research explores the ways that teachers conceptualise authentic learning experiences for primary school children in response to consistent observations in the literature of the need for schools to change in an effort to meet the needs of modern learners. The research aims to report its findings from analysis of data gathered as early career teachers explore their professional identities in connection with a professional development model designed in response to themes emerging from the literature and collaboration with classroom teachers of more than five years experience. At the time of publication of this paper, the study was in Phase 3, the first iteration of the design.

Introduction

As with teachers at all levels of education, primary school teachers are challenged to more adequately meet the perceived needs of learners today. Research identifies that children and young people spend their time both studying and in the pursuit of leisure in ways differing from previous generations (Oblinger & Hawkins, 2005; Leu & Coiro, 2004; Prensky, 2006) and that their educational needs, therefore, are different too. The literature reports that education needs to be more relevant to the needs of the learner and that the skills and strategies developed at school should be transferable to the context of real world events and workplace demands (Jonassen, 2003; Gambrell, 2005; Gee, 2004). Some have suggested that teachers are ill prepared to meet these needs because professional development has been misdirected (McKenzie, 2006) and that teachers are 'digital immigrants' incapable of truly understanding the 'digital native' sitting in their classroom (Prensky, 2001).

Schools have been further criticised in the past as providing learning experiences that simply prepare children for school rather than for successful participation in their communities (Gee, 2004; Kohn, 1999). Further, Jonassen (2003) identifies 'school' problems (well organised problems that provide all of the information required for reaching a single correct answer) as inhibiting the learner from developing effective problem solving skills. He argues that real problems are rarely straight forward with a single correct answer, rather, they require critical analysis as the person considers the advantages and disadvantages of each course of action and identifies the most appropriate outcome for the situation (Jonassen, 2003). Herrington, Oliver and Reeves (2003) describe learning experiences that build resilience and flexibility as 'authentic learning tasks'. They argue that learning experiences that include the 10 principles of authentic learning will enable learners to develop flexibility in application of problem solving strategies not only to problems designed as part of subject content but also to the less predictable and more important problems encountered in life. The principles of authentic activities are as follows:

Authentic activities:

- have real world relevance
- are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity
- comprise complex tasks to be investigated by students over a sustained period of time
- provide the opportunity to examine tasks from different perspectives, using a variety of resources
- provide the opportunity to collaborate
- provide the opportunity to reflect
- can be integrated, applied across different subject areas and lead beyond domain specific outcomes
- are seamlessly integrated with assessment
- create polished products valuable in their own right rather than as preparation for something else
- allow competing solutions and diversity of outcome (Herrington et al., 2003)

There are examples in the literature of teachers who have and continue to explore the ways that learning experiences allow children to transfer their learning beyond the classroom to their out of school contexts (For example, Comber, Thomson, & Wells, 2001; Labbo, Eakle, & Montero, 2002; Kervin & Moore, 2004; Leu, 2000; Banaszewski, 2002). Many teachers have made significant shifts to a paradigm that embraces new technologies and teaching approaches within sound pedagogy that questions and critiques change through the lens of what constitutes 'good' learning experiences. The expertise of such teachers, borne of knowledge gained through professional development, teaching experience and reflection on teaching and learning holds the potential to complement existing findings and enrich the theoretical understandings of the nature of teaching today. It is on this premise that a design based research approach was adopted to frame this investigation of teaching through authentic learning experiences.

Design-based research approach

The design based approach (van den Akker, Gravemeijer, McKenny, & Nieveen, 2006) is commonly linked to research into computer based technologies and the learning environments they afford, culminating in the creation of products to be used in solving identified problems. While it is anticipated that using such technologies to support learning will feature in the findings, this study's focus is to conceptualise guiding principles for the design and implementation of authentic learning tasks and to identify ways that teachers may operationalise them in their classrooms. Anfara and Mertz (2006) argue that looking beyond one's own field of expertise to consider the theoretical frameworks of others can provide fresh perspectives and new understandings about a theoretical problem. It is with this focus on the development of guiding principles along with the opportunity to make links between classroom practice and learning theories that

design based research was selected as an appropriate overall approach for this study.

Joseph (2004) identifies the three goals of design-based research as 'research, design and pedagogical practice' (p. 235). Following a literature review and collaboration with practitioners, an intervention designed to meet the needs of the problem is applied within the natural setting of the classroom. Through an iterative cycle of data collection and analysis, the researcher refines the principles of the intervention according to the information interpreted from the data. The aim is twofold - to refine both theory *and* practice (Collins, Joseph, & Bielaczyc, 2004); the researcher uses findings from careful analysis of data collected during the interventions to contribute to the existing body of research to provide a deeper understanding of the problem as well as having practical applications for classroom teaching and learning experiences. In the case of this research, the twofold aim is to inform theoretical understandings of the ways that professional identity is developed and to improve the planning and delivery of professional development experiences for teachers both in higher education and with in-service teachers.

Four phases characterise the design-based research approach, as depicted in Figure 1, following which, each of the phases are described in connection with this investigation of teaching through authentic learning experiences. The design outlining the phases and iterations for this study is represented diagrammatically in Figure 1.

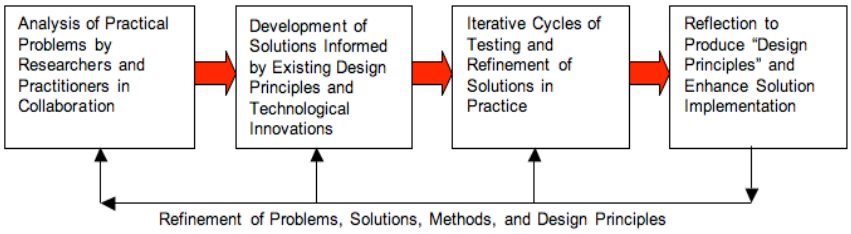


Figure 1 Design Based Research Approach (Reeves, 2006)

Phase 1: Analysis of practical problems by researchers and practitioners in collaboration

In the current research, the literature and collaboration with practitioners revealed that teachers hear conflicting messages about what is 'good' teaching in their classrooms and the ways that such experiences are best implemented. For early career teachers, this was observed to make planning and teaching difficult in the absence of years of experience and opportunities to reflect on this practice with others within a professional network.

Ethics approval was sought for the study prior to initiating Phase 1, allowing for interviews to be conducted with teachers of more than five years experience. Teachers were selected for this Phase through snowball sampling (Bogdan & Biklen, 1998) – that is, teachers referred the researcher to others who were exploring their own pedagogies in similar ways. Collaboration with teachers practising longer than five years who have had the benefit of these experiences enriched the findings in the literature (including the principles of authentic learning articulated by Herrington, Oliver & Reeves, 2003), with analysis of interview transcripts and documents informing the emerging themes that underpin the design of the intervention.

Phase 2: Development of solutions informed by existing design principles and technological innovations

The 'solution' or intervention in this study is a professional development course for early career teachers underpinned by the themes identified and explored in the literature and analysis of data collected from extended interviews with practising teachers of more than five years experience. The professional development course utilises the focus of the teacher as a reflective practitioner and is designed as an exploration of the emerging themes identified in Phase 1 in connection with the knowledge, skills and experiences of the early career teachers participating in the professional development workshops. Practising teachers interviewed in Phase 1 are invited to participate in the workshops to facilitate professional development with a focus on the themes emerging from Phase 1. Planned activities designed to promote discussion and analysis during workshops includes facilitator input, reading and discussion of case studies of teachers, viewing and discussion of teacher practise, vignettes, guest presentations, professional dialogue, individual and group reflections. Provision is also made in the design for an espace for each early career teacher where they are asked to post weblogs that reflect on their teaching experiences in connection with the professional reading, discussions and workshops.

Phase 3: Iterative cycles of testing and refinement of solutions in practice

Interview, observation and collection of artefacts from participant early career teachers provide data throughout Phase 3. Initial data collected in pre-intervention interviews will inform the facilitation of the professional development course in terms of understanding the existing beliefs and practices of the early career teachers and how these can be used to enrich the intervention. It is important to note that although the early career teachers are less experienced than their more experienced colleagues interviewed in Phase 1, there is no assumption that they are 'empty slates' awaiting the delivery of knowledge. On the contrary, it is anticipated that the early career teachers will enrich the findings of the research with their more recent theoretical study (as University undergraduates) and (often) more youthful perspectives.

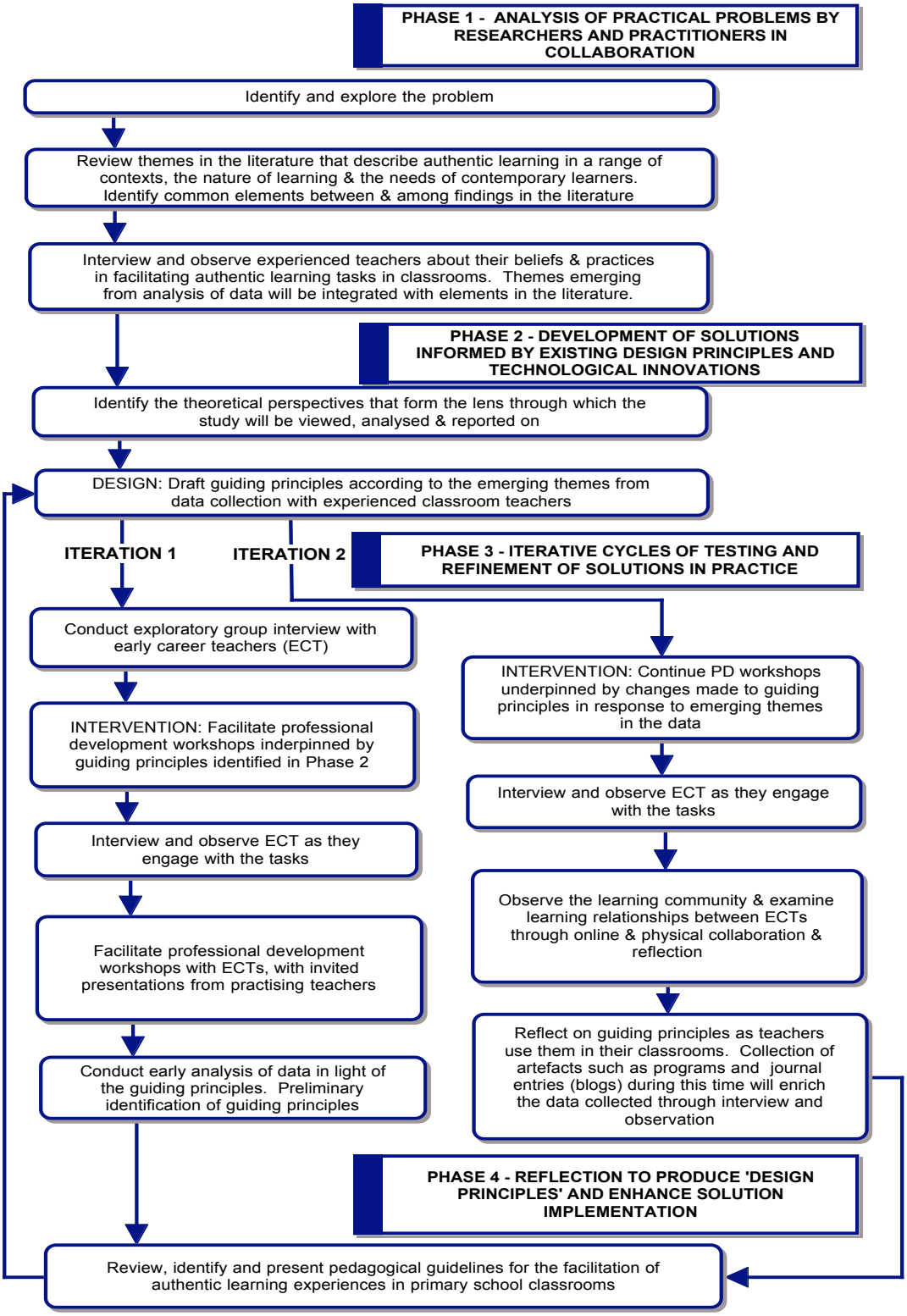
Iterations of data collection and analysis in Phase 3 will allow for review and modification of the guiding principles under investigation. Data are collected over two University Sessions (Spring and Autumn), approximately eleven months – at the publication of this paper, this study is in its first iteration.

Phase 4: Reflection to produce 'design principles' and enhance solution implementation.

It is anticipated that engagement with this recursive process will result in a deep and comprehensive understanding of the theoretical underpinnings of the guiding principles for the facilitation of authentic learning experiences in primary school classrooms. The study will move briefly through Phase 4 at the first iteration, tentative in its identification of design principles, to return to Phase 2 – design of the professional development intervention. Emerging understandings are checked with colleagues and practitioners as a second professional development intervention is designed. This design will take on a

different format to the first, the early career teachers will not participate in regular workshops, but form their own professional community as they continue to explore the elements of the design through their experiences. Data are collected through weblog entries, interview and through focus group interviews. This form of intervention recognises the growing professional identities of the early career teachers as their experiences enrich their pedagogical understandings.

Figure 2 Overview of Study Design

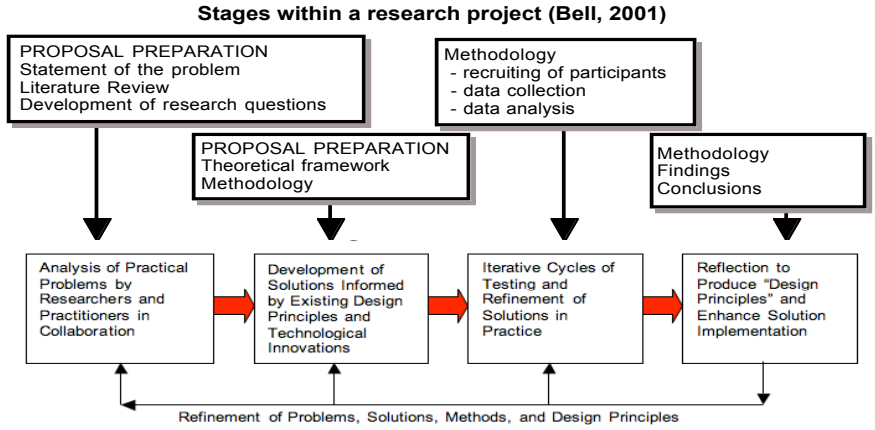


At the culmination of the second iteration, design principles will be identified and findings disseminated.

Design based research and doctoral study

The design based research approach (Reeves, 2006) is identified in the literature as suitable for doctoral students as they develop the skills and strategies required for becoming a researcher and attaining a doctoral degree because the Phases of the approach match with the stages of conducting doctoral research (Herrington, McKenny, Reeves, & Oliver, 2007). Figure 3 gives a pictorial representation of the match between stages of PhD study (Bell, 2001) and design based research Phases.

Figure 3 Phases of design-based research approach and relationship to doctoral study



For this study, design based research has supported well the requirements and processes of doctoral study. At the proposal stage of the research, the problem had been identified, a literature review conducted, emerging themes identified in the literature and theoretical framework and methodology articulated. Taking a design based approach to the study created flexibility in identifying suitable theoretical frameworks and methodology, allowing the researcher to adopt the preferred lens through which the study would be analysed. Following faculty and ethics approval, a return to Phase 1 allowed for collaboration with practitioners. This opportunity for collaboration in designing the intervention (professional development for early career teachers) allowed for the acknowledgement of the pedagogical expertise of classroom teachers.

Iterations throughout the study allow the research to take on a deeper analysis of preliminary findings as reflection on the intervention and its influence propel the study into further collection, reflection and analysis. Herrington et. al (2007) identify this robust approach as effective in preparing doctoral students for 'rigorous scholarly inquiry' (p. 2). Phase 4 of the approach requires the presentation of guiding principles and dissemination of the findings for gain both in theoretical and practical settings, an important stage in the process for emerging researchers intending to conduct further educational research.

Concluding reflections

A design based approach to this study of teachers and their developing understandings of the ways they support the learning of the children in their care brings the worlds of theory and theory in practice together. The opportunity to collaborate with those teachers who have worked extensively in the field not only enriches the design of the solution, but also builds a partnership between the researcher and the classroom. In implementing the solution, close observation of early career teachers as they explore the responsibilities, pressures and expectations of classroom teachers allows for rigorous testing and modification of the design principles for facilitating authentic learning experiences for children.

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