Contribution Type   Academic Article

Title   **Using design-based research to explore the influence of context in promoting pedagogical reform**

Author   **Rhonda Di Biase**
The University of Melbourne
Australia

Abstract   Many developing countries are seeking to improve the quality of education by promoting the use of learner-centred pedagogy as part of system-wide reform. Yet numerous studies reveal a gap between what is envisaged in policy and what happens in practice and the inherent limitations of uncritical adoption of 'best practice' from elsewhere into local contexts. Therefore design-based research (DBR), as an interventionist approach, was selected to investigate the conditions under which the innovation of learner-centred education can be implemented in the authentic setting of a Maldivian island school. The paper elaborates the rationale underpinning this choice and a discussion of the defining features of DBR as they applied in this study: acknowledging the importance of context; facilitating collaboration between researcher and participants; and attending to a theoretical output of the research. The participatory approach which underpinned how DBR was utilised in the study and its implications for enhancing the context-appropriateness of and teachers' engagement with the reforms are also discussed. In doing so, the paper illustrates the ways in which the defining features of DBR respond to the call for better attention to context as a means for facilitating greater success of global reform efforts.

Participatory research

Dedicationtab I dedicate this article to the late Professor David Clarke, a wonderful mentor who inspired this study.

Using design-based research to explore the influence of context in promoting pedagogical reform

Rhonda Di Biase

1.0   Introduction

In light of international targets such as the Education For All Goals and the Sustainable Development Goals, many countries are seeking to improve the quality of education by promoting the use of learner-centred approaches as part of system-wide reform. This comes with support from donor organisations promoting such participatory and democratic approaches to teaching, also referred to as active learning. Within this reform agenda, there is a gap between what is envisaged in such policies and what happens in practice. A substantial body of literature documents the challenges of implementing such a reform agenda across a range of developing countries, where widespread endorsement of this pedagogical approach is seen as an antidote to teacher transmission models (Leyendecker, Ottevanger, & Van den Akker, 2008). It is also well-documented that a lack of attention to contextual features during this process of reform is a contributing factor in the policy-practice gap (Crossley, 2010; Schweisfurth, 2013a). Reports of learner-centred education (LCE) reform across various contexts are 'riddled with stories of failure grand and small' (Schweisfurth, 2011, p. 425), highlighting the ongoing and widespread nature of the challenges facing such pedagogical reform across contexts, where teacher-centred approaches prevail.

The aim of the paper is to reflect on a completed design-based research (DBR) project. Reporting from a doctoral study, this paper explores how DBR was used to investigate the well-documented implementation challenges of pedagogical reform in a low-resource, developing country context. The study took place in the Maldives, a small island developing state (SIDS). SIDS are categorized for having distinct contextual features. The geographic and demographic dispersion of the population in this archipelago presents major challenges in providing services across the country. Acknowledging these distinctive characteristics, the study investigated the enabling conditions for promoting LCE within the Maldivian education system.

In this reflection I consider how the conceptualisation of this DBR project aligned with the research problem and explore how the interplay between the research design and the contextual features, that were illuminated through the fieldwork, provided insights into the overall findings. The notion of border crossing in DBR highlights the role of the researcher as moving beyond being merely an observer, but instead, stepping into the field and participating in real-life settings

with practitioners (Sloane & Euler, 2017). In doing so, Sloane asks if researchers then generate a new kind of knowledge. In this study the researcher's first-hand experience and long-term engagement within a Maldivian island school helps bridge the gap between what is studied through the research and what is experienced by practitioners. It is the stepping beyond the role of observer into the world of the practitioner that helps bridge the gap between 'research and practical doing' (Sloane & Euler, 2017, p. 6). Noting the influence of contextual factors on the work of teachers, this 'practical doing' on behalf of the researcher provides insights into the contextual factors that influence teachers' work in the Maldives and the conditions that help facilitate innovation in practice.

The paper begins with a discussion about the education context in the Maldives and refers to wider literature about LCE reform internationally. Outlining the DBR approach taken, I then illustrate how the defining features of DBR were used to respond to the call for better attention to context in reform efforts. Next, the phases of the research and the ways in which the various elements of the context influenced the research design, the evolution of the intervention design and the conduct of the fieldwork are discussed. Finally, the complexities of working collaboratively in a cross-cultural setting are explored as are how the tensions that arose were addressed.

2.0   Promoting learner-centred pedagogy in the Maldives

My interest comes from working in the country following the 2004 Boxing Day tsunami to promote school reform and, in particular, pedagogical innovation. My engagement was part of a wider UNICEF-led reform known as the Child Friendly Schools (CFS) project that promoted child-centred active learning. Through my work at the Faculty of Education, Maldives National University, I encountered a mismatch between policy and practice which became particularly acute when students went on teaching placement and they tried to reconcile contradictory messages about what pedagogical practices they should be using. The gap between what was envisioned in policy at the system level and what messages filtered to schools, and the often-conflicting pressures about what teachers should prioritise in their teaching was particularly evident. The aspirations for education articulated by the school curriculum developers within the Ministry of Education (MOE), along with the content of the pre-service subjects, were seemingly at odds with the perception in schools about what teaching practices were most valued. This highlighted a series of tensions within the system and specific contextual challenges.

Furthermore, I discovered that the introduction of the CFS approach into the Maldives was based on the Gonoshahajjo Sangstha (GSS) model from Bangladesh and its use of learning corners in primary classrooms. The learning corners approach worked better in theory than in the practice (Shafeega et al., 2005) with recurring challenges

documented across several studies in the Maldives (McNair, 2009; Shareef, 2007; Wheatcroft, 2004). Teaching practices notably remained reliant on the textbook and teacher transmission approaches. Findings from these local studies pointed to the need to: involve the school community in the reform process to facilitate local ownership in promoting innovation; develop a clear vision of active learning that offered operational clarity for teachers; provide teachers with practical support; and match the innovation to the local conditions and available resources.

My observations from visiting Maldivian classrooms were that teachers were unable to implement the GSS model as it required new ways of working that were too far removed from their current practices. Essentially, it did not seem a good fit for their work. Acknowledging the well-intentioned efforts of various individual organisations and the vision of the MOE to promote pedagogical reform, I was interested to understand what a contextually relevant model of active learning might look like, that was suitable to the context and circumstances of teachers' work. The choice of the term active learning has been used in this study as it is consistent with the language used in the CFS project. However, the term LCE is often used in the literature; so, the terms have been used interchangeably in this paper.

3.0   Transfer of inappropriate models

Learner-centred education (LCE) as a 'global travelling policy' (Schweisfurth, 2013a) originates in contexts quite different to those where implementation challenges have been found. LCE has been imported to contexts where 'the realities of educational governance and resources for schools have not historically accommodated it' (Schweisfurth, 2013b, p. 3). Further, she states that 'pedagogies which are not in harmony with the cultural context are bound to face implementation difficulties' (p. 69). Any innovation is challenging but LCE is particularly demanding because of profound shifts required in teacher/learner power relations (O'Sullivan, 2004; Schweisfurth, 2011), which may conflict with the local understanding of authority structures (UNESCO, 2015).

The limits of the uncritical transfer of innovations from other contexts (Akyeampong, Pryor, & Ampiah, 2006) can be seen in the implementation challenges of LCE. However, as argued by Elliot (2014, p. 39), 'it would be folly to ignore good practice wherever it is located'. Likewise, Mohammed and Harlech-Jones (2008) contend that much is already known about what works, but this knowledge is often ignored when implementing such reforms. Schweisfurth (2011, p. 430) asserts there is a need 'to move the debate beyond ready-made solutions and the all-too-predictable problems', implying the need for new research directions. Therefore, in considering the Maldivian policy context and the challenges in implementing the CFS approach, this study focused

on developing a contextually relevant model of active learning that reflected local priorities and fitted with the circumstances of teachers' work.

4.0 Bridging the gap

In light of the documented challenges of implementing LCE in low-resource contexts and the call for new research directions, the use of DBR responds to the call from Chisholm and Leyendecker (2008) for more research on the gap between policy and practice and the conditions needed in different contexts for successful implementation of LCE. DBR seeks to address complex real-world problems and is particularly suited to chronically difficult problems. Schweisfurth (2011), in her review of 72 studies related to LCE, calls for a move beyond bland statements to a more detailed analysis of what works, for whom and how.

Acknowledging the call for better attention to context in reform efforts, DBR, with its focus on real-world problems, provided an appropriate methodology for this study. Van den Akker (2002) advocates the use of DBR for educational development in developing countries because of its specific focus on context, its flexibility, and its potential for capacity building. Numerous studies (for example, Johnson, Hodges, & Monk, 2000; O'Sullivan, 2004) outline the necessity to acknowledge explicitly the realities of the context in developing countries. Therefore, DBR in responding to 'the messiness of real-world practice' (O'Toole & Beckett, 2009, p. 71) provided the avenue for my research through which to design and implement a contextually relevant pedagogical intervention.

Rogan and Grayson (2003, p. 1171) detail how 'all too often the attention and energies of policymakers and politicians are focused on the 'what' of desired educational change while neglecting the 'how''. In the disparity between policy and practice in LCE reform, DBR provides a methodology that explicitly studies 'how' an innovation works. Specifically, DBR seeks to 'understand how, why, and under what conditions interventions work' in real-world contexts (McKenney & Reeves, 2012, p. 171).

Within this research-practice nexus, DBR is focused on both developing useable knowledge (McKenney & Reeves, 2012, p. 8) and making a theoretical contribution of value to those outside the setting (McKenney & Reeves, 2012, p. 28). It is an attempt to address the research-practice gap (McKenney & Reeves, 2012) through the collaborative effort of teachers and researchers as they work toward achieving the pedagogical goal of the intervention (Bradley, 2004, p. 2). Bradley and Reinking (2011b, p. 307) point to a fundamental dissatisfaction with limitations of more conventional approaches to educational research. They contend that although naturalistic studies may document complexities of the context, typically they 'do not

address how a teacher might manage those factors to implement effectively and efficiently an instructional intervention'. DBR attempts to address these limitations and not only takes into consideration the contextual complexities of a classroom, but also aims to reveal factors that enhance or inhibit an intervention (Bradley & Reinking, 2011b, p. 306).

5.0 Overview of the research design

The aim of this study was to investigate active learning reform in the Maldives and the conditions within which it can be implemented. To pursue this investigation, I conducted a qualitative study using a DBR approach with the goal of generating knowledge to better understand the gap between policy and practice in this context and to provide insights in the form of design principles for other similar low-resource contexts.

The overarching research question of this study was:

How can teachers enact active learning pedagogy within the Maldivian education system?

The three sub-questions that supported this study were:

1. *What form does active learning pedagogy take in the Maldivian context?*

2. *What are the enabling conditions that support the use of active learning pedagogy?*

3. *What are the factors that hinder the use of active learning pedagogy?*

The flexibility of DBR allows for rich variations in approach and interpretation in its application (McKenney & Reeves, 2012). Drawing on a range of DBR process models (Cobb & Gravemeijer, 2008; Plomp & Nieveen, 2007; Reeves, 2000; Schoenfeld, 2009), Table 1 outlines the DBR phases and their characteristics as conceptualised for this study.

Table 1. The phases of design-based research used in this study

Phase	Characteristics	Implications for this study
Contextual analysis	Analysis of a practical problem	Investigate the problem Document the current status of active learning in the setting
Generating the intervention design	Generation of a promising solution	Generate a promising solution from the literature Refine the solution to the particular needs of the local context Prepare for operationalising the intervention
Operationalising the intervention	Exploration of conditions under which the intervention seems to work Experimentation in the classroom	Implement the intervention as an instructional model of active learning in a Maldivian school setting Document teachers' use of the instructional model
Retrospective analysis	Documentation and reflection to produce design principles	Analyse use of instructional model Identify emergent supporting and inhibiting factors Produce design principles

This structure was adopted as it provided a framework for the study that drew on multiple sources of knowledge. In having identified the problem to be researched (LCE reform) and drawing on the knowledge base about the transfer of inappropriate models, the phases identified here were designed to draw together community input along with ideas from previous research, to propose a 'promising solution' (see Figure 2). This was then implemented within the context of a Maldivian island school. Underpinning the various phases of the study are participatory principles, designed to harness non-academic local knowledge to better understand issues of importance within the community (Bowd, Ozerdem, & Kassa, 2010). This involved collaboration with a range of stakeholders from the Maldivian island school community. Informing the decision to frame the research in participatory terms is the belief that the collective experience, knowledge and skills of participants and researcher adds strength to the study by tapping into different knowledge forms.

5.1   Phases of the research

In adhering to the DBR structure outlined in Table 1, the study was conducted in a Maldivian island school across two phases: a contextual analysis phase; and the intervention phase. The school was selected as an information-rich case because of their proactive uptake of the CFS approach and interest in promoting innovation. Choosing such a school was aimed at moving the debate beyond the well-documented challenges of LCE reform and to explore practice and innovation in the best possible circumstances (Altinyelken, 2011). In this study, it meant

implementing the intervention under optimum conditions. Participants were drawn from the school community and included teachers, school management and parents. The fieldwork, across both phases, took place over an eight-month period. These phases and corresponding participants and data collection tools are shown in Table 2.

Table 2. Data collection tools that were used in different phases of the study

Study phase	Participants	Data collection tools
Contextual analysis – local island context	Parents, teachers, leadership team	• The World Café: - Photo elicitation activity - Graphic elicitation activities • Teacher questionnaire • Semi-structured interviews
Generating the intervention design	Group A participating teachers	• Teacher's workshop • Teacher group meeting • Field notes • Classroom observations
Operationalising the intervention	7 Group A teachers – Grades 1-3 7 Group B teachers – Grades 5-7	• Record of teacher discussion • Field notes • Teacher questionnaire • Semi-structured interviews
Retrospective analysis	7 Group A teachers – Grades 1-3 7 Group B teachers – Grades 5-7 Leading teachers	• Teacher questionnaire • Semi-structured interviews
System level policy	MOE officials, UNICEF, Faculty of Education	• Semi-structured interviews

A number of participants, who were drawn from the wider education sector (system level), were included in the study to understand the 'context and surrounding systems' (McKenney & Reeves, 2012, p. 169).

Contextual analysis phase

The contextual analysis phase was conducted using an approach known as the World Café. This is a process that seeks to encourage collaborative dialogue, share knowledge and consider opportunities for action (Brown & Isaacs, 2005). The World Café involved a series of group activities. The use of group strategies enabled greater numbers of participants to be involved in the contextual analysis, thereby allowing a greater number of voices to be heard in this phase (Chambers, 2007). Such an approach is also well suited to cultural contexts 'that privilege the communal over the individual' (Stephens, 2009, p. 94) which is applicable to the Maldives.

The activities were designed to give voice to all the relevant stakeholders and sought to build a vision of active learning of relevance to this school community. The World Café was adapted to include photo and graphic elicitation methods as seen in Figure 1 which included photo ranking and concept mapping completed by parents, teachers and school management working in small, discrete groups. These methods were selected to enable communication without solely relying on language 'as the privileged medium for the creation and communication of knowledge' and 'allow us to access and represent different levels of experience' (Bagnoli, 2009, p. 3).
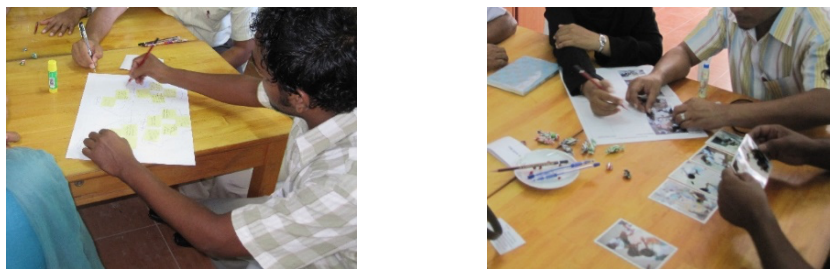
Figure 1. The World Café activities – Photo and graphic elicitation activities

The overarching findings from the World Café (Di Biase, 2015) provided insights into the priorities of the school community in relation to active learning approaches:

- The need to change the role of teacher to be a facilitator of learning

- The importance of student involvement and participation

- The need for group work as an aid to learning

- Focus on equity and the importance of being inclusive of all students.

These priorities were important input in developing a contextually relevant model of active learning as shown in Figure 2.

5.3   Intervention phase

The intervention was informed by several key inputs outlined in Figure 2. In promoting a contextually relevant model of active learning, based on constructivist learning principles, the World Café data provided valuable input for the advancement of a pedagogical model that aligned with local circumstances and reflected community priorities. The intervention was also informed by recommendations in the literature regarding LCE reform (Di Biase, 2019a).
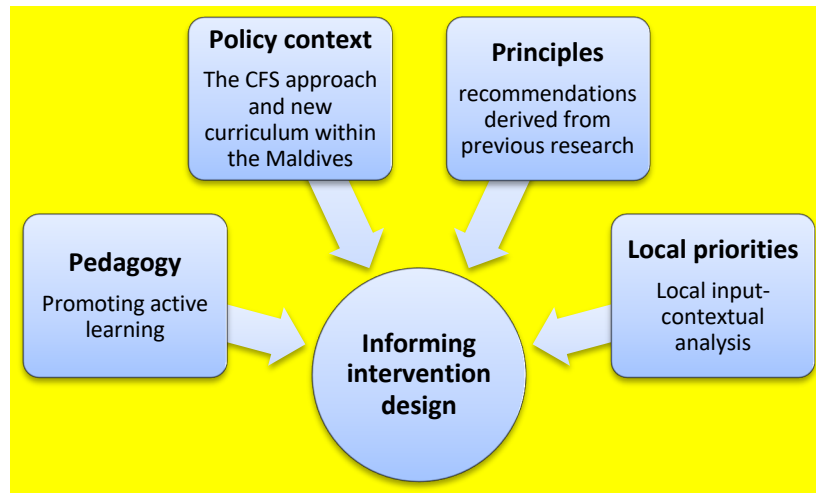

Figure 2. Inputs informing the intervention design

The intervention that evolved was an instructional model that provided teachers with a clear structure for their lessons but also promoted opportunity for group work and student participation, priorities identified in the World Café (Di Biase, 2019b). Through the intervention phase the pedagogical model was implemented and the factors influencing the way it was used by the teachers were investigated. As outlined in Table 2, 14 teachers participated in the intervention phase. Qualitative data were collected through semi-structured interviews; questionnaires; classroom observations; teacher recording booklets; and a field notes journal.

6.0   A rationale for Design-based Research

In serving the dual purpose of refining locally valuable innovations and developing more globally useable knowledge (Design-Based Research Collective, 2003), DBR is a multi-faceted complex endeavour (McKenney & Reeves, 2012, p. 1). The following characteristics are considered to be defining essential features of DBR (McKenney & Reeves, 2012).

- Responsively grounded: structured to explore and adapt to the complexities of the learning context.

- Interventionist: design of intervention in authentic settings.

- Collaborative: requires collaboration between teachers and researcher.

- Theoretically oriented: design based on theory and makes a contribution to theory building based on field-testing.

- Iterative: incorporates cycles of design, evaluation and revision.

These characteristics feature the interplay of theory and practice within DBR and provide insights into the collaboration between researcher and practitioner, illustrating in more detail the notion of crossing borders as it transpired in this study. These essential characteristics of DBR have implications for this study. In this section I outline why DBR was an appropriate methodology for addressing the research questions, and how the essential characteristics were embedded in the research design.

6.1 Responsively grounded – Context is acknowledged

Design-based research is grounded in context and 'structured to explore, rather than mute, the complex realities of the teaching and learning contexts' (McKenney & Reeves, 2012, p. 15). This statement resonates poignantly with my study, as does the argument by researchers investigating LCE reform (for example, Johnson, Hodges, & Monk, 2000; O'Sullivan, 2004) for the need to acknowledge explicitly the realities of the context in developing countries when implementing educational reform. Likewise, van den Akker's (2002) assertion that the acknowledgement of context in DBR makes it particularly useful in developing countries is pertinent. Moreover, DBR addresses the call for research on LCE reform and provides a more detailed analysis of what works, for whom and how (Schweisfurth, 2011).

McKenney, Nieveen and van den Akker (2006) discuss DBR efforts to change learning from traditional to more activity-based, highlighting gaps between the intended and implemented curriculum. Further, Alexander (2001) points to a lack of coherence in the education system, resulting in an unproductive blame game. In contrast, DBR embraces the 'harsh realities of the systems in which educational interventions operate' and thereby offers a high degree of ecological validity (McKenney & Reeves, 2012, p. 171). This makes it particularly suitable for the study of LCE reform as the documented challenges are acknowledged, and the impact of context on the viability of LCE are recognised, realising that the learning environment must be respected in DBR (Bradley & Reinking, 2011b).

DBR gives specific consideration to the conditions under which the innovation is effective or not (Bradley & Reinking, 2011a). Researchers study not only the immediate context, but the surrounding system as well (McKenney & Reeves, 2012, p. 171). Implications from MOE policies were not ignored in documenting the factors that inhibited or supported the use of the intervention in this context as shown in Table 2. Figure 3, adapted from Bronfenbrenner's (1979) ecological

framework, provides a conceptualisation of the research setting and the contextual layers of influence on teachers' practice.
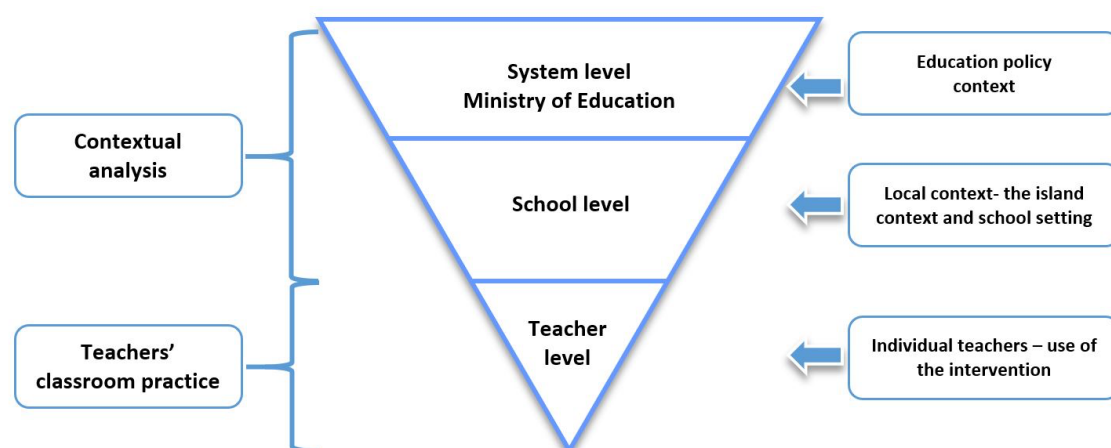

Figure 3. A conceptualisation of the research setting and surrounding system

In shifting from a detached researcher role to enter into the real-life setting, particularly in the smallness of this Maldivian island school and community, meant I experienced the layers of contextual influences on teachers' practice first-hand. The characteristics of DBR provide a framework for not only addressing the identified problem but also acknowledge the various layers of influence impacting teachers' practice. This study, therefore, sought to investigate the complexity and influence of the interacting education system (Zawojewski, Chamberlin, Hjalmarson, & Lewis, 2008).

6.2 Interventionist – addressing practical problems

Using the definition proposed by McKenney and Reeves (2012, p. 14) an intervention 'encompasses the different kinds of solutions to real problems'. The study centred on a pedagogical intervention – an instructional model of active learning (Di Biase, 2019b) that considered the role of the teacher and evolved from existing practice. It was developed collaboratively with teachers and then implemented in the school to identify the enabling conditions and inhibiting factors in teachers' use of the model. A strength of this research is that in better understanding LCE reform, the study documented not only what teachers say but what they do in their work (Zawojewski et al., 2008).

In considering curriculum reform from a DBR perspective, McKenney et al. (2006, p. 72) describe three levels of outputs: (1) the resulting knowledge that is generated; (2) the development of particular products or programs of value to an education community; and (3) the professional development of participants. These multi-level outputs apply in this study through the pedagogical intervention, which has practical implications for both teachers and the school. In using this model, the teachers were focused on experiencing new strategies in their own classrooms and had the opportunity for professional development. The potential benefit for the school community, into which I was welcomed to conduct the study, was an important consideration for me in the design of this research.

My role as researcher was multi-pronged as I assumed the additional roles of workshop leader, teacher in the school and member of the island community. The complexity of managing these multiple roles is explored more fully in Section 7.

6.3   Collaborative

Long term collaboration is required between researcher and practitioners in DBR (Design-Based Research Collective, 2003; Ma & Harmon, 2009), so they can work together to produce meaningful change in the context of practice (Design-Based Research Collective, 2003). As well as developing a professionally productive relationship, the researcher relies on teachers' knowledge and expertise to assist in the identification of factors that can enhance or inhibit an instructional intervention's effectiveness (Bradley & Reinking, 2011b). Yet this does not necessarily mean that teachers and researchers have equal roles and responsibilities for conducting the research (Bradley & Reinking, 2011b, p. 308). Rather, the collaboration is a negotiated and mutually agreed upon process.

Within this investigation several participatory strategies were used in the contextual analysis to explore viewpoints across stakeholder groups within the school, such as the World Café. These strategies were also designed to establish the initial conditions in the school and identify attitudes and priorities towards active learning methods. Further, in adhering to the participatory underpinnings of the study, I set out to construct myself and teachers as partners in the research process. The goal was for teachers to have an explicit voice in defining their needs during the intervention phase, and specifically to have direct input into the intervention design, bringing different knowledge into the design of the intervention as illustrated in Figure 2.

6.4   Theoretically oriented

Design-based research has multiple outputs – creating practical solutions and developing more globally useable knowledge for the field (Design-Based Research Collective, 2003) and is deemed appropriate when existing knowledge falls short (McKenney et al., 2006). A plausible solution (Reeves, 2000) is developed by scanning the field for similar studies and designing interventions 'based on principles derived from prior research' (O'Toole & Beckett, 2009, p. 71). In my study, these principles were articulated from a synthesis of the literature, relevant to LCE reform in other low-resource contexts. These theoretical inputs shaped an understanding of the problem and enhanced the development of a solution.

Further, design principles as the theoretical outcome of this DBR study were generated following the intervention phase. DBR is not just about what works in practice, but is intended to 'generate evidence-based claims about learning that may be transferable to similar contexts' (O'Toole & Beckett, 2009, p. 72). A challenge then for DBR is to develop flexible research trajectories that meet these dual goals.

Whilst DBR was chosen to investigate a clearly articulated practical problem of relevance in the Maldives, it also has implications beyond the Maldivian context in seeking to investigate the well-documented challenges of LCE reform, particularly in low-resource contexts where teacher-centred approaches prevail. An output of trialing the intervention is to yield 'theoretical understanding that can inform the work of others' (McKenney & Reeves, 2012, p. 7). Thereby, the theoretical outputs or design principles generated by DBR are intended to inform future research with similar pedagogical goals in other contexts beyond the Maldives.

6.5   Iterative

DBR is generally an iterative process where the intervention evolves through stages and over time. Typically, the intervention undergoes investigation, development, testing and refinement (McKenney & Reeves, 2012) and often with a team of researchers. This study was carried out with one researcher who also had responsibility for the teachers' professional learning throughout the intervention phase. Notwithstanding the iterative nature of DBR, Ma and Harmon (2009) outlined a single-iteration model which they argued fills a gap in the literature. Moreover, Drexler (2010, p. 36) reports that 'practically speaking, a single-iteration design condenses the dissertation into a manageable timeline with well-documented results to inform future iterations and provide implications for further research'. As a solo researcher, and given the particular contextual features of the Maldives, the instructional model promoting active learning was adopted, developed from a single iteration. Therefore, like Ma and Harmon (2009), this study reported on evidence about the effectiveness of a single iteration of the instructional model implemented within an island school site and documented the contextual factors faced by teachers. My study thereby attended to 'the influence of factors that support and constrain effective practice' (Kelly, Baek, Lesh, & Bannan-Ritland, 2008, p.12). In reference to his three-phase model of conducting DBR, Schoenfeld (2009) guards against rushing to stage 3, large-scale testing, without adequate attention to stages 1 and 2. This study focused on the tenets of stages 1 and 2; trialing a promising solution and exploring the conditions under which it works. The knowledge gained has subsequently been used to inform further research in other island schools.

7.0   Context, design-based research and the research process

The way in which the various elements of the context influenced the research design, the conduct of the fieldwork and the elaboration of the theoretical outcomes of the research, form the basis of further discussion related to the use of DBR within my study. The following factors provide insights into conducting DBR and the advantages and

challenges of this approach. In a link between theory and practice, these factors highlight important contextual factors that became part of the study of the systems surrounding the intervention (McKenney & Reeves, 2012). This also becomes a personal journey of border crossing and examining the merging of the roles of researcher and practitioner.

7.1   The insularity of island living

The characteristics of small states being constrained, remote and dependent provide some insight into the challenges of conducting research in a small state setting (Louisy, 1997). Islands being small and bounded means that isolation and peripherality are real challenges faced by island populations (Royle, 2001). These were also problems faced during my fieldwork. Being far from the capital, having limited internet capacity, and at the mercy of the weather and good fortune to travel off the island, I frequently felt very isolated. Yet by living on the island for eight months I experienced first-hand some of the challenges of small island living and came to know intimately the context in which the teachers worked. With most Maldivian teachers working in island schools, this insight was an unanticipated consequence of my fieldwork. Through my extended period of island living, I believe I was better able to stand in the teachers' shoes and understand the daily challenges they faced. I experienced the particular social ecology of small states and the highly personalised nature of relationships (Farrugia & Attard, 1989). Initially not only was I seen as the 'expert' but also as an outsider to the island. As personal relationships developed in the school over time, the teachers responded more openly, actively and explicitly to my presence. Despite this expert role, a familiarity grew through our daily interactions and from my perspective became less hierarchical. This enhanced my opportunities to ask questions about classes in a more relaxed and open environment.

7.2   Participation as rhetoric

Participatory research involves researchers and participants working collaboratively to examine a problematic situation, or to engage in some relevant action (Kindon, Pain, & Kesby, 2007, p. 1). As previously noted, this study was designed on participatory principles. Yet a frequent criticism is the danger of simply paying lip service to participation (Stephens, 2009, p. 32). I focused on collaboration and participation in two distinct ways: first through the contextual analysis phase of the study and the inclusive, collaborative strategies adopted; and second, I set out to construct myself and teachers as equal partners in the research process (Table 3). The goal had been for teachers to have an explicit voice in defining their needs and have direct input into the intervention design. The World Café, tested in a

pilot study, worked extremely well with all stakeholders. Yet, the expectation that teachers would be willing, or able, to voice their needs and provide explicit input into the intervention design required adapting from what I had initially envisaged.

My initial participatory focus was centred on teachers and myself being equal partners, bringing different, yet complementary sets of knowledge to the research process. It was, however, necessary to adapt to the circumstances where I was clearly positioned as an expert, given my profile of having worked at the local university and my experience of teaching in a range of countries. Therefore, establishing an equal partnership with the teachers was more complex than I had anticipated. In reflecting on this challenge, the experience of Mdee (2010) in Tanzania, echoed my own experience. She questioned whether absolute equality was possible given imbalances in knowledge, power and resources. It was clear that my background and experience with constructivist pedagogies positioned me as an expert in the eyes of the Maldivian teachers. This was made more acute as a visitor to the island, where teachers sought access to outside resources and expertise, given their isolation, exacerbated by unreliable internet access and transport difficulties. I concluded that for the intervention to gain impetus it would be necessary for me to provide more guidance than I had envisaged, and I would need to lead the process. Once I had adjusted to this expectation, the collaboration took on a new form.

Therefore, participation evolved naturally through the fieldwork as relationship and trust grew between myself, as the researcher, and the participants. A helpful distinction is made by Dale (2005) who distinguishes between participation as contribution and participation as empowerment. Within this study, participation progressed from participants contributing to the process of innovation and development of the active learning intervention in the early stages to one in which participants clearly assumed greater levels of responsibility for their own decision-making and involvement throughout the fieldwork. It also allowed participants to accept decision-making responsibilities on their terms, rather than according to my timeline. My accepting the 'expert' role was an example of adapting to contextual factors.

Whilst the participatory intentions of the study were modified in response to circumstances in the field, the unintended consequences were beneficial in enabling the empowerment component of teachers' participation to evolve naturally as our relationship developed over time, a definite advantage of staying in one school. A challenge of DBR is being able to sustain relationships in the field for extended periods. I believe that by adapting to the circumstances outlined, the collaboration between myself and the teachers was strengthened, not weakened.

Table 3. Participatory research approach used

Participatory research approach: addressing potential issues		
	The World Café	**Intervention phase**
Participation as rhetoric	Use of participatory tools where participants can express views using a range of strategies, including non-verbal techniques	Teachers' priorities were sought in ascertaining the focus of the intervention
Romanticising the notion of community	People of the same status working together in groups	Group process balanced with individual interviews over the course of the fieldwork
Expert-local dichotomy	Minimal interference or feedback from the facilitator during group activities	'Design' based on collective knowledge input – blend of theory, research and practice

7.3 Cross cultural research: insider/outsider status

Operating in a cross-cultural situation places additional layers of complexity on interactions (Patton, 2002, p. 391). My position as a non-Maldivian was potentially limiting if I was perceived as lacking 'understanding or empathy' or someone who 'misunderstands and misinterprets the behaviours within the community' (Liamputtong, 2010, p. 110). I was cognizant of my insider/outsider status. Clearly, I stood out on the island as an Australian white female. From an outsider perspective, there were some potential advantages (Liamputtong, 2010):

- being able to see phenomena that insiders don't see; and

- participants being more willing to share with outsiders who are beyond the chain of hierarchy.

I did feel as rapport built with the teachers that they were willing to share their experiences in an open and honest way. The way our collaboration evolved, I believe, is an indication that as an outsider to the island I was able to carry out this research in a culturally appropriate and effective manner.

However, my previous experience in the country also positioned me with some insider status, given my understanding of Maldivian culture and the local education system. This was epitomized in an interaction with someone from school leadership who said, in relation to educational practices, 'you know how it works'. It is this background, and indeed these insights and experience that led to the decision to carry out this research.

7.4 Time constraints: negotiating school process

The dual session school day necessitated making myself available across two school sessions each day and made for an intense working day. It also limited the time when all teachers could be called to meet together. The sheer number of school activities taking place in the evenings or on weekends meant working around this busy schedule to arrange meetings with teachers, either individually or in groups. This was one of the major constraints I had to manage in my research activities. However, it did personalise for me the nature of the teachers' working week and help develop a better appreciation of the context in which they work.

Destefano and Crouch (2006) attest to the importance of clearing space for reform and the importance of creating the intellectual and political space for new ideas. In my field notes, I noted the busy nature of the school and its impact on scheduling times with teachers. One advantage of being an outsider in cross-cultural research is being able to see phenomena that insiders do not see, and I noticed as stream of extra activities that teachers did not question. I also learnt during my extended immersion that the school has a central role in island life, particularly on smaller islands, and I observed great excitement for certain functions that brought the island community together. Such activities, in my observation and according to teachers' responses, impacted on their time for planning and teaching.

All research is concerned with yielding valid and reliable knowledge (Merriam, 2009). Miles and Huberman (1994, p. 262) raise the concern of the researcher working alone in the field – what they label a vertical monopoly. They state that emphasis is often on the 'what' and less on the 'how' when reporting research. DBR has embedded within it, a focus on the process, which places a substantial responsibility on a single researcher in juggling multiple roles, as previously highlighted. Yet, the explicit attention to documenting decisions taken in the field helps mitigate against the effects of the vertical monopoly. In fact, the Design-Based Research Collective (2003, p. 7) states, 'methods that document processes of enactment provide critical evidence to establish warrants for claims about why outcomes occurred'.

Maxwell (2010) espouses that validity is not guaranteed by following a prescribed procedure. Instead, specific measures need to be discussed in relation to the purposes and circumstances of the research and show how they worked in practice. There are strategies which Maxwell (2010, p. 282) contends 'are nonetheless essential to the process of ruling out validity threats'. Within the DBR framework and utilising qualitative methods, a range of strategies for establishing trustworthiness of the study were employed. These 'validity tests' (Maxwell, 2010, p. 282) are described as they worked in practice.

7.5 Long-term engagement

Through the long-term engagement inherent in DBR, a strong feature of this study was the prolonged time spent in the school. There were repeated observations and interviews, as well as the sustained presence of the researcher in the setting, which helped 'rule out spurious associations and premature theories' (Maxwell, 2010, p. 283). Given the particular social ecology of small states, this was particularly pertinent.

7.6 'Rich' data

Associated with this prolonged involvement was the generation of rich accounts derived from the multiple data sources and methods, and extended immersion in the setting, features of DBR (Kelly et al., 2008; McKenney & Reeves, 2012). The multiple methods were specifically designed to capture the character of this setting through rich description, and to leave no participant unvoiced.

7.7 Triangulation

DBR typically triangulates multiple sources and data collection methods to capture intended and unintended outcomes of enactment (Design-Based Research Collective, 2003). Importantly, the multiple methods allow for the cross-checking and triangulation of findings (Patton, 2002). Triangulation, through the diverse range of methods employed, reduced the risk of chance association and systematic biases (Maxwell, 2010). Specifically, in this study participants were given multiple avenues in which to voice their thinking. It was possible to check for consistency of responses across the range of the World Café activities and looking for discrepant examples across the different stakeholder groups. The range of methods used to capture teacher experiences of the intervention likewise allowed the examination of data for consistencies and discrepancies across individual teachers.

7.8 Quasi-statistics

Another way of cross-checking conclusions of qualitative data is to make explicit the quantitative component of the data. Such quantitative analysis is limited to frequency counts and percentage conversions and does not involve statistical analysis and the manipulation of variables. 'Quasi-statistics' can provide evidence to support claims (Maxwell, 2010). Moreover, Miles and Huberman (1994, p. 253) attest there are three good reasons for resorting to numbers: 'to see rapidly what you have in a large batch of data; to verify a hunch or a hypothesis; and to keep yourself analytically honest, protecting against bias'. Used in this way, quantification supported and illuminated the study's qualitative analysis. Teacher data from questionnaires and recording booklets were collated into

tables and tallies were calculated, allowing for a comparison of the responses across and between teacher groups.

7.9 Member checking

Member checking is a process of seeking feedback on emergent findings from participants (Merriam, 2009). Through the collaborative nature of the research design in DBR, data generation was subject to member checking. For example, preliminary results from the World Café were shared and discussed prior to the intervention stage. I also sought clarifications with key stakeholders during the process of data collection. Upon leaving the island I made a presentation to the senior management team, providing an overview of my activities and presenting my preliminary data analysis that had been completed to that point. This allowed for dialogue and feedback following the intervention phase, prior to leaving the island.

7.10 Reflexivity

Reflexivity is the 'the process of reflecting critically on the self as researcher, the 'human as instrument' (Lincoln & Guba, 2005, p. 210). This entailed explicitly acknowledging my assumptions as I entered this investigation. My field notes journal facilitated reflection on the multiple roles of DBR, already noted as a challenge of DBR. I also used them to reflect on my role as a researcher and on my daily actions. My daily journal entries were a vital tool in maintaining an element of distance from the research activities and became a source of data about the research process as well as drawing attention to contextual factors, which provided details about the school, the local island and factors from the Ministry that influenced teachers' daily work.

8.0 Discussion and conclusion

> *I was due to depart the island, the site of my research, at 2.30 am on a fishing boat. More than one tear had been shed at the prospect of leaving the island community. This single event epitomised much about this research experience. The sense of being wrenched out of a community to which I had become a fixture also tells the story of the evolving partnership on which this research project was predicated [Field notes].*

This event illustrates some unique characteristics in the Maldives. After several frustrating delays I chose to travel back to Malé on a fishing boat for the nine-hour journey, despite fearing the sea conditions in the middle of the monsoon. Such are the challenges of living and travelling within this country of islands where 99% of its area is water. I had faced transportation

difficulties more than once in my movements between the research site island and Malé during my fieldwork. This brought an authenticity to living in such a geographically unique country. The consequences this time were very real as I could potentially miss my flight home. Yet, these are challenges Maldivians face on a daily basis: the cost and availability of transport; the vagaries of the weather; and accessing centralised services.

Furthermore, this event tells the story of Maldivian lifestyle – of island communities and fisherman by tradition. On this boat the fishermen were travelling to Malé to stock up on ice and to access resources that are not available on local islands. It also tells the story of personal relationships within this small nation. The fishermen were acquainted with the school – perhaps their children attended and perhaps they were related to teachers with whom I had worked. I was no longer a stranger on the island and to leave in this way, for the final journey, seemed a fitting end and symbolic of the web of relations within the island community. This experience captures the lived experience of living on a small island and walking in the shoes of teachers during this prolonged immersion.

In this way, both the immediate island context and surrounding systems were studied. Schweisfurth (2013b) asserts that the global context cannot be segregated from practical realities and local desires in her analysis of LCE reform. Small states, with their distinctive characteristics, reveal more acutely the limitations of the one size fits all when it comes to educational reform. Small states have particular needs and priorities due to their size, and it may well be that these distinctive characteristics serve to illustrate the need for innovation to be locally grounded (Crossley, 2012) and adapted to local circumstances. In fact, Veenendaal and Corbett (2014, p. 1) consider this in their article 'Why small states offer important answers to large questions'. Likewise, Crossley and Sprague (2012) maintain that research on education in small states illustrates how and why contextual factors deserve greater attention. They conclude that learning from small states 'can play a strategic role in challenging global tendencies towards uncritical international transfer of educational policy, practice and development modalities – while contributing innovative and pioneering experience from which others can learn' (Crossley & Sprague, 2012, p. 36).

A major outcome of the study was the generation of design principles following the intervention phase (Di Biase, 2019a). Instead of asking 'Whether the intervention worked?', I framed the discussion around 'What worked for whom and in what circumstances?' (Pawson & Tilley, 1997). This was a strength of using DBR and specifically attended to investigating the 'how' of

educational change and the conditions under which interventions work (McKenney & Reeves, 2012).

The implementation of active learning approaches has been reported to be problematic with 'the debris of faulty and failed projects and programmes' (Mohammed & Harlech-Jones, 2008, p. 48) well-documented across multiple contexts. Acknowledging this, there is a need to move the debate beyond the all-too-predictable problems (Schweisfurth, 2011) and recognise that much is known about what does work, but that this knowledge is frequently ignored (Mohammed & Harlech-Jones, 2008). Embracing rather than ignoring such knowledge, this design-based research (DBR) studied active learning through the development of a pedagogical intervention. The intervention, developed as a 'promising solution' derived from the literature, was contextually grounded by reflecting and respecting local perspectives and priorities identified through the contextual analysis phase.

With teachers placed at the centre of this study, the question of 'For whom and in what context?' was explored. The question of 'What works?' was also considered, discussing teachers' enactment of the intervention and what this revealed about the possibility of active learning reform in the Maldivian context. Finally, since DBR specifically attends to the contextual complexities, the active learning intervention was discussed, not simply in terms of whether it worked, but with a focus on what works under what circumstances. The study concluded with nine design principles that emerged from this study and responded to the question 'under what circumstances?' (Di Biase, 2019a). As the major output from the study, they consider the contextual realities for teachers in a developing country context.

The intent of DBR is to trial possible solutions and to explore the conditions under which each works (Schoenfeld, 2009). In exploring rather than muting the complexities of the context (McKenney & Reeves, 2012), the investigation aimed to reveal the factors that both support and inhibit the innovation. Furthermore, DBR acknowledges the various layers of influence impacting teachers' practice and the influence of the interacting education system (Zawojewski et al., 2008). As such, the DBR approach and the design principles arising out of this study respond to Schweisfurth's (2011) call for a move beyond bland statements to a more detailed analysis of what works, for whom and how.

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Author Profile   **Rhonda Di Biase** is a lecturer at the Melbourne Graduate School of Education, The University of Melbourne. She has previously worked at the Faculty of Education, Maldives National University as part of a post-tsunami aid project promoting active learning pedagogy in local schools. She returned to the Maldives National University with the support of an Endeavour Executive Fellowship, an Australian government grant, to showcase and promote local research. Her research interests include pedagogical innovation and active learning reform, teachers' professional learning and education reform in small states. Rhonda has been recognized for her scholarly research work with awards for excellence in research.

Author Details   **Rhonda Di Biase**
Melbourne Graduate School of Education
The University of Melbourne
Victoria 3010
Australia
+61 3403956975
dibiaser@unimelb.edu.au

Editor Details   **Prof. Dr. Tobias Jenert**
Chair of Higher education and Educational Development
University of Paderborn
Warburgerstraße 100
Germany
+49 5251 60-2372
Tobias.Jenert@upb.de