

## An Intervention in literacy in three Pacific nations: Implications of a context specific approach to co-design

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*In this paper, we consider the implications of a commitment to acknowledging the role of context within a research practice partnership. We outline the approach to doing so within a design-based research intervention with 42 schools across three Pacific Island countries to improve literacy learning and language development. In doing so, the paper identifies context as a central concern for student and teacher learning, for schools as organisations and for intervention implementation. We draw on theories of context from each of these research bases to consider how aid interventions can best contribute to enhancing student learning outcomes across varied student populations in a way that is contextually appropriate, and builds sustainable local capability for ongoing improvement. In considering these concerns we argue for the potential of a design-based research approach, based on the Learning Schools Model (McNaughton, Lai, Jesson & Wilson, 2013) to incorporate 'co-design' of the intervention. We exemplify how the process of jointly designing the content and implementation within preset phases of implementation is possible in ways that draw on the varied expertise of in-country and external partners. The focus on collective knowledge building, collective problem solving and sharing practice within trusting relationships is considered to foster capacity for sustained adaptation and improvement at local levels. We believe such an approach is relevant to the challenges faced by Pacific Island Ministries of Education and their aid donor partners in designing effective interventions for learning improvement.*

*Keywords: educational improvement, schools, literacy*

## INTRODUCTION

In this paper, we consider the implications for intervention methodology when working in a research practice partnership and taking a design-based approach to working with schools. We report on the approach taken with 42 schools across three Pacific Island countries to improve students' literacy learning and language development in the early grades. In doing so, we bring together three intersecting concerns prominent in discussions of international aid interventions for school improvement; resource constraints, contextual appropriateness and sustainability. Specifically, we consider the implications of these concerns in implementing an aid intervention which seeks to contribute to enhancing student learning outcomes across varied student populations in a way that is 1) commensurate with the resources (financial and human) available; 2) is contextually appropriate; and 3) builds sustainable local capability for ongoing improvement and adaptation. This paper presents an argument for the potential of a design-based research approach based on the Learning Schools Model (McNaughton, Lai, Jesson & Wilson, 2013) for addressing these concerns within the context presented by the Pacific Island countries involved.

In this article, we exemplify a partnership approach to intervention design, involving in-country and external partners at every level (school, Ministry authorities, programme team) and at every stage of the process, which we call co-design. We illustrate how such an approach allows a targeted intervention to be developed in ways that are theoretically robust, contextually responsive and build sustainable capability for ongoing improvement. We argue too that examining local practice through collective problem solving offers both a 'mirror' and a 'window' view on practice. Feedback on data collected provide a mirror and catalyst for reflection and analysis of practice, as well as offering a window into different ways of doing things for researchers as well as teachers. While the process is replicated across contexts, the inbuilt co-design leads to improvements in practice that draw on international expertise as well as being intentionally context-relevant and therefore meaningful. Further, we argue that the emphasis on collective problem solving and sharing practice within trusting relationships fosters capacity for sustained adaptation and improvement at local levels. We believe such an approach is relevant to the challenges faced by Pacific Island Ministries of Education and their aid donor partners in designing effective interventions for learning improvement. However, we also consider the tensions inherent in such an approach.

This paper starts with an overview of the Pacific Literacy and School Leadership Programme (PLSLP) – the research-practice partnership that we are reporting on – and the background to its establishment, including a description of the design-based research methodology used within the partnership. Key elements of the theoretical framework that underpin the design of the partnership are then presented. The corollaries of the theoretical framework for the design and implementation of the intervention are then demonstrated through describing the various phases of the intervention and methods used. The paper concludes with a brief discussion of tensions created by a design-based research approach and the resulting strategies to address these within the approach.

## **BACKGROUND TO THE PACIFIC LITERACY AND SCHOOL LEADERSHIP PROGRAMME**

The Pacific Literacy and School Leadership Programme (PLSLP) was initiated in 2014 by the New Zealand Aid Programme in partnership with Ministries of Education in several Pacific countries. PLSLP was initiated as a response to concerns about low literacy

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achievement scores amongst students and a desire expressed by the participating Ministries to better understand and develop local solutions to the specific dynamics of the patterns of literacy achievement. The University of Auckland in partnership with the Institute of Education of the University of the South Pacific were selected to design and implement a programme that would address these concerns, across three relatively diverse Pacific Island countries working with between 12 and 15 schools per country<sup>1</sup>.

While diverse, the countries share relatively centralised systems, a high proportion of geographically dispersed schools with variable transport and communication infrastructure, bi- or multi-lingual school populations, and constraints in sustaining an adequately qualified teacher workforce. Responsibility for teacher professional learning and development, curriculum design, and resource provision largely rests with the national Ministries in each country. With the vast majority of education budgets dedicated to payroll, there are limited resources and variable structures for the ongoing professional support and development of the teaching profession. International aid for education service delivery and reform has been a prominent feature of all three countries involved in PLSLP and is likely to continue to be for the foreseeable future. Finally, all three countries meet the criteria of so-called “small island developing states”, which proponents of this classification argue bring particular challenges for education development related to scale, geography, and institutionalism (Crossley, 2010).

PLSLP was initiated partly in response to Ministry and aid donor concerns about the limited impact at a classroom level of previous interventions, and lack of robust information about the actual practices of teaching and learning occurring within the classrooms, and the relationship to student outcomes (NZ MFAT, 2014). While literacy has long been a stated priority across most Pacific Island jurisdictions, Pacific governments and aid donors alike have tended to focus on top-down initiatives often managerial in focus such as school-based management, curricula reform and development, accountability driven mechanisms such as standardised assessments and performance standards (NZ MFAT, 2014). While there is increased recognition of the pivotal role teachers and school leaders play in achieving and sustaining learning outcomes, and a greater focus on mechanisms for motivating higher performance from teachers and leaders within schools, the pathways for achieving these have not been clear.

It is in this context, that we responded to the opportunity presented by PLSLP to design an intervention that could achieve demonstrable improvements in students’ literacy and language learning within participating schools while also demonstrating the viability of developing local improvement networks through a co-design approach that is contextualised, evidence-based, and that can achieve sustained improvements in learning beyond the finite injection of aid funds or ‘expert’ resources. A design-based implementation research (DBIR) methodology was proposed, broadly defined by key features of: collaboration between researchers and practitioners; situated in a real educational context; focused on an urgent issue of practice to advance valued student outcomes; evidence-based with iterative cycles of data collection and problem solving to design, test and implement a significant intervention (Anderson & Shattuck, 2012; Fishman, Penuel, Allen, Cheng & Sabelli, 2013).

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<sup>1</sup> The programme was implemented after approval by the University of Auckland Human Participants Ethics Committee.

## THEORETICAL FRAME

This section describes the key elements of the theoretical framework underpinning the design of PLSLP, drawing on educational, improvement science and international development literature. The perspectives within these research fields reflect the varied knowledge base required in an international development intervention that is designed to improve learning for children through teacher professional learning and schooling improvement.

Considered from an Ecological Systems Theory perspective (Bronfenbrenner, 1992), children's development can be considered to be the ongoing and mutually constitutive interaction between the active child and the changing properties of her settings over time. In terms of any efforts towards describing how learning occurs in a particular context, there is a need to understand the changing nature of the learning environment for children as well as the changes in their development within that environment. Importantly, however, the mechanisms for learning reside in the mutually constitutive interactions between the child and her environment and the processes that occur in that interaction. So, understanding learning in a given context would also seek to identify those processes. Bronfenbrenner (1992) calls this a 'Process-Person-Context' Model of research design. This ecological model therefore situates children's learning within the specific changing context and provides a focus for understanding the contextual nature of children's learning.

A further implication of the ecological perspective is the significant role of other people in a context, their beliefs and values as well as their actions, to the development of the child (Bronfenbrenner, 1992). In a schooling intervention, this highlights the role of the teacher, the beliefs she may have about the developing child, the beliefs about learning and literacy more generally and the teaching actions she may undertake. In a schooling improvement context, these beliefs would also include values about what might count as a problem and what might count as improvement for the child. This aspect of the ecological perspective coheres with what is known about professional learning more generally: that for professional learning to have an effect, it needs to engage with teachers' beliefs about learning, and learners (Timperley, Wilson, Barrar & Fung, 2008).

Therefore, to develop an intervention that improves outcomes for learners, a design is required that builds theoretical and empirical understanding about the relationship between child and her learning environment, and that enables other people (i.e. teachers) in the child's environment to interact with the developing child in ways that alter learning processes beneficially over time. In other words, the intervention should enable teachers to recognise more accurately the relationship between their own practice (teaching) and their students' learning, and act on this understanding to change their practice to advance student learning. In such a way, the approach might also be considered to take an ecological approach to teachers' learning by situating professional learning within the specific context. In addition to benefits for the professional learning of individual teachers, the ongoing analysis and response inherent in such an approach has been termed 'improvement science', with an intervention logic that seeks to develop a systemic and organised method of learning to improve (Bryk, 2015).

Such a research model is germane to international aid efforts to intervene in learning environments in 'developing' nations, where contextual variability, local capability-building, and sustainability are key concerns. Context is a source of fundamental tension in international aid. The international aid system is premised on the assumption that knowledge and practice from one (developed) space can be transferred and applied to achieve similar

ends in another (less developed). This is most obvious at the level of global agencies such as the World Bank and United Nations' agencies who drive a particular education agenda at the global level that both determines what the priority problems are and applies 'best practice' solutions regardless of contextual difference (Coxon & Munce, 2008; Crossley, 2010; Pritchett & Sandefur, 2013). The international development system in general, as Mosse argues, "emphasizes universal over contextual knowledge, a knowledge system that is deductive and oriented to general predictive models, and that constantly organizes attention away from the contingencies of practice and the plurality of perspectives" (Mosse, 2011, p. 87).

However, an implication of the Ecological Systems theory, and indeed a repeated finding of studies which examine the relationship of context and cognition, is that context can be considered to be a constituent of cognition (see, for example, Ceci, Bronfenbrenner, & Baker, 1988). If this context-specific nature of cognition is taken seriously in international aid interventions, then any intention to introduce best practice or evidence informed approaches to teaching in developing nations is unlikely to succeed without a strong theoretical and empirical basis for understanding the relationships between the given context, learning processes and children's outcomes in that context.

In saying this, we take context to be an emergent property of the dynamic interactions between people, actions, ideas, and material conditions. Context in this sense is "a process or set of relations, not a thing in itself" (Dilley, 1999, p.5). Typically, in the design of aid interventions, context is treated as a collection of features of a space in time, which can be described, categorised, and then managed (Stephens, 2007). In contrast, we argue context is an inherently relational and therefore political, lived dynamic that must be negotiated in an ongoing way. Contextualised interventions, therefore, should provide for ongoing, iterative engagement and reflection about the dynamic interactions of the context, involving both researchers and practitioners, and allow intervention design to flow from these. Co-design provides a mechanism for doing so.

This leads to a final thread in our theoretical framework that we wish to highlight here by acknowledging the multitude of dynamic interactions within a given school context. The complexity of any school context requires a shift in focus from teachers' learning at an individual level to learning and change at an organisational level. In designing interventions to bring about change within school environments, we argue that schools need to be recognised as complex systems, involving multiple agents with varied interests and power, in which change in any direction emerges from endogenous processes of development and adaptation (Jörg, Davisc & Nickmans, 2007; Snyder, 2013). The implication of this is the relevance of a collective-action approach to intervening in schooling environments, which suggests that achieving change is best solved through an intervention approach that focuses on locally defined problems, adopts iterative design principles of experimentation and tight feedback loops to encourage experiential learning, and engages multiple agents to build legitimacy, relevance and political viability (e.g. Booth, 2011; Andrews, Woolcock & Pritchett, 2012). This differs from the more common models prevalent in international aid interventions reliant on economic constructs, where achieving improving service delivery is seen as a principal-agent, supply-demand problem. When combined with the preference within international aid for general predictive models and the influence of managerial solutions, this focus on principal-agent directionality has generated interventions that impose top-down reforms and often punitive accountability strategies based on the premise that

enforcing accountability motivates performance, and that principals and agents each act and react uniformly.

In summary, based on the combination of theoretical perspectives outlined above, we argue that improving learning at the school level requires the development of contextually-specific ‘improvement networks’ that work through collective and iterative processes of problem-solving based on local evidence.

## **THE INTERVENTION APPROACH**

The claim developed in this article is that a research and intervention approach is needed that creates conditions for implementing an as-yet-unknown set of changes to teaching and schooling practices in ways that are demonstrably effective for children within the dynamic context. Internationally, such an approach has been described as Design Based Implementation Research (DBIR). Fishman, Penuel, Allen, Cheng and Sabelli (2013) characterise the approach as having key features required of a contextualised intervention design, in that there is a commitment to addressing persistent problems, from multiple perspectives, using collaborative design. Further, the approach advances the dual aims of developing knowledge related to classroom learning (Anderson & Shattuck, 2012) while also developing knowledge of how best to implement changes. Finally, imperative in international aid work is the need to develop capacity in the system for sustaining changes within ever-changing contexts and also continuing to change in ways that are considered an improvement (Bryk 2015; Fishman, et al., 2013).

The shift in the nature of the research design to building new contextualized understandings requires an attendant shift in relational understandings between researchers and practitioners. Snow (2015) describes the redefinition of the roles of researchers and practitioners in applied contexts, which she labels Practice Embedded Educational Research, as acknowledging and valuing the ‘dual knowledge sources’ of research and practice as contributing to the intervention design and implementation. In the international aid context in cross-national settings, the ‘knowledge sources’ acknowledged are also contextual. Thus, the partnership model in the programme of work has been described as a ‘weaving model’ of design (Veikune & Spratt, 2016), acknowledging the multiple knowledge sources of in-country researchers and academics; external researchers and academics; external practitioners and facilitators, and in-country practitioners, teachers, leaders and Ministry personnel. The notion of co-design relies on such positioning, founded firmly on practice knowledge and local knowledge. The DBIR agenda is thus one of co-development of knowledge, rather than knowledge transfer, and positions participants as co-designers of the intervention through professional learning communities, rather than recipients of professional development through workshops.

## **COROLLARIES OF THE CO-DESIGN APPROACH FOR INTERVENTION METHODOLOGY**

The co-design approach has been expressed throughout the development and implementation of the specific intervention approach for PLSLP. In this section, the phases of the approach are illustrated as they apply to literacy development in 42 schools in three Pacific Island nations. The design-based approach that we call the Learning Schools Model (McNaughton, Lai, Jesson & Wilson; McNaughton & Lai, 2009) formed the process of iterative design. Using the model, the intervention was developed and implemented using a

phased approach, with profiling, implementation and sustainability phases built into the iterations. Within each phase, evidence about student achievement, patterns of teaching, and school practices were collected, using descriptive (rather than evaluative) observation and interview procedures. These data offered the opportunity for teachers and researchers to co-design, that is, to: engage in discussion and debate about the perceived relationships between the teaching patterns and the learning patterns within each context; to develop hypotheses and shared understandings about the elements of effectiveness and what change in practice was needed.

### **The profiling phase**

In traditional terms, the profiling phase was concerned with collecting baseline data about the teaching practice, the learning processes and the learning outcomes. In terms of the 'Process-Person-Context' Model however, the profiling phase also served to build understandings amongst teachers and the in-country team about the interactions between teaching and learning in each context. In terms of co-design, the sources of data relevant in each country were negotiated between in-country and external researchers and practitioners. In each country, the profile included the collection of country level student achievement statistics (standardised test scores) for the country as a whole, and where available for the students in the participating schools. Where possible, teacher assessments about literacy were also collected, and teacher interviews with observed teachers were conducted. Tools for the collection of the data were co-designed in order to ask context relevant questions and observe context relevant aspects of practice. The classroom observation formats and interview protocols were developed in a workshop session hosted by the University of the South Pacific and involving UOA team members and in-country team members from the three participating countries. In total 11 academics from four countries participated in the two day co-design workshop.

In order that classroom observations provided an overall picture of the patterns of instruction in the context, a time sampling method of observation was employed. For the first 10 minutes of any observation, observers drew a map of the classroom, and noted resources on display or accessible. This initial 10 minute phase offered a settling in period for the observation, where observers were looking around the room, at walls, books and any other resources, and therefore were not focussed on the teacher, at least at first. Following the classroom mapping, observers alternated between focussing on teaching practices for a three minute interval, then observed the learning processes engaged in by three randomly selected students for a minute each. This sampling cycle was repeated six times, culminating in six intervals of observed teaching (18 minutes per teacher) and 6 minutes each for three children (18 minutes in total).

Observations were conducted by external and in country academics and facilitators, using post observation debriefing and moderation to ensure consistency. Profiling data collection visits were conducted for between two and three weeks by a team of four or five in each country, and consisted of classroom observations in sample year levels, debriefing discussions with observed teachers, interviews with non-observed teachers and interviews with leaders. The observation format is included in Figure 1. It was designed to be descriptive (rather than evaluative) and as low-inference as possible. For the interval focussed on the teacher, observers noted which texts were used, what the teaching focus was, the number of students the teacher was working with, the nature of the feedback given and the teaching approach used. For each interval focussed on a child, observers noted what they were engaged in, how many children they were working with and what language, if any,

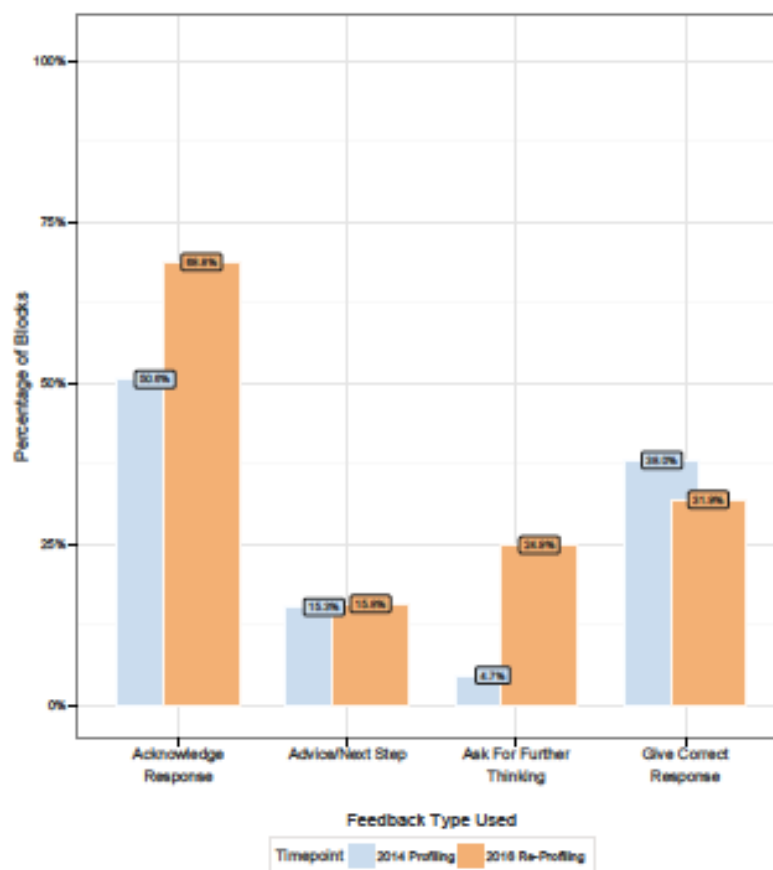
Please record for 3 minutes what the teacher is <b>MOSTLY</b> doing by circling one of the provided options.		Please observe 3 students closely. Select students during the 10 minute mapping time. Circle <b>ONE</b> main activity they are involved in for <b>MOST</b> of the minute.			
<b>Time (hh:mm):</b> ..... Teacher is working with <b>#students:</b> ..... (either: size of group, "1-1" for one-on-one, or "class" for whole class)		<b>Boy</b> (1 minute)	<b>Girl</b> (1 minute)	<input type="checkbox"/> Girl <input type="checkbox"/> Boy (1 minute)	
<b>Text Resources:</b> ALL text resources teacher is using.  <b>Published Resources Used:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No Language: <input type="checkbox"/> English <input type="checkbox"/> Pijin <input type="checkbox"/> Other Detail:  <b>Teacher-Made Resources Used:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No Language: <input type="checkbox"/> English <input type="checkbox"/> Pijin <input type="checkbox"/> Other Detail:  <b>Student-Made Resources Used:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No Language: <input type="checkbox"/> English <input type="checkbox"/> Pijin <input type="checkbox"/> Other Detail:  <b>Non-Text Resources Used:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No Detail (e.g., guest speaker/photo/CD):  <b>Feedback Given</b> <input type="checkbox"/> Yes <input type="checkbox"/> No (if yes tick <b>ALL</b> observed)  <input type="checkbox"/> Acknowledge Correct/ Incorrect Response <input type="checkbox"/> Give Correct Response <input type="checkbox"/> Ask For Further Thinking <input type="checkbox"/> Advice/Next Step <input type="checkbox"/> <b>Other (Describe):</b>	<b>Teaching Focus:</b> <b>What are teachers teaching?</b>  Tick <b>ONE</b> option, recording focus for <b>MOST</b> of the time.  <b>Reading</b> <input type="checkbox"/> Read Letters <input type="checkbox"/> Read Syllables <input type="checkbox"/> Read Words <input type="checkbox"/> Read Sentences <input type="checkbox"/> Read Text <input type="checkbox"/> Talk/Think About Their Reading  <b>Writing</b> <input type="checkbox"/> Write Letters <input type="checkbox"/> Write Syllables <input type="checkbox"/> Write Words <input type="checkbox"/> Write Sentences <input type="checkbox"/> Write Text <input type="checkbox"/> Talk/Think About Their Writing  <b>Other Focus</b> <input type="checkbox"/> Oracy <input type="checkbox"/> Copying <input type="checkbox"/> Planning <input type="checkbox"/> Management  <input type="checkbox"/> <b>Other (Describe):</b>	<b>Teaching Approach:</b> <b>How are teachers teaching it?</b>  Tick <b>ONE</b> option, recording main strategy for <b>MOST</b> of the time.  <input type="checkbox"/> <b>Showing/Telling/Explaining</b> (The teacher is talking and the children are listening)  <input type="checkbox"/> <b>Repetition, Chanting, Drills And Rote Learning Techniques</b> (The teacher is talking and the children are repeating)  <input type="checkbox"/> <b>Asking Questions And Calling On Students To Answer</b> (The teacher is talking and the children are answering questions)  <input type="checkbox"/> <b>Engaging Children In Conversation</b> (The teacher and the children are talking. Children's turns are longer than one sentence)  <input type="checkbox"/> <b>Monitoring Behaviour</b> (The teacher is walking around the room and mostly monitoring behaviour)  <input type="checkbox"/> <b>Rove &amp; Assist</b> (The teacher is roving around class/groups/individuals and supporting the focus)  <input type="checkbox"/> <b>Marking &amp; Evaluation</b> (The teacher is marking & evaluating e.g., student writing, reading, workbook)  <input type="checkbox"/> <b>Other (Describe)</b>	<b>Reading</b> <input type="checkbox"/> Reading: Letters/Syllables (Phonics) <input type="checkbox"/> Reading: Single Words <input type="checkbox"/> Reading: Sentences <input type="checkbox"/> Reading Text Aloud <input type="checkbox"/> Reading Text Silently <input type="checkbox"/> Word Meanings (Vocabulary) <input type="checkbox"/> Comprehension  <b>Writing/Spelling</b> <input type="checkbox"/> Copying <input type="checkbox"/> Writing: Letters/Syllables (Phonics) <input type="checkbox"/> Writing: Single Words (Spelling) <input type="checkbox"/> Writing: Sentences <input type="checkbox"/> Composing A Story (Paragraph Or More)  <b>Other literacy related foci</b> <input type="checkbox"/> Speaking <input type="checkbox"/> Listening <input type="checkbox"/> Other  <b>Non-literacy</b> <input type="checkbox"/> Waiting <input type="checkbox"/> Drawing/Decorating/Crafting <input type="checkbox"/> Tidying up <input type="checkbox"/> Off-task  <b>The child is working with:</b> <input type="checkbox"/> alone <input type="checkbox"/> whole class <input type="checkbox"/> ..... # other students if in groups Mainly using: <input type="checkbox"/> English <input type="checkbox"/> Pijin <input type="checkbox"/> Other <input type="checkbox"/> None	<b>Reading</b> <input type="checkbox"/> Reading: Letters/Syllables (Phonics) <input type="checkbox"/> Reading: Single Words <input type="checkbox"/> Reading: Sentences <input type="checkbox"/> Reading Text Aloud <input type="checkbox"/> Reading Text Silently <input type="checkbox"/> Word Meanings (Vocabulary) <input type="checkbox"/> Comprehension  <b>Writing/Spelling</b> <input type="checkbox"/> Copying <input type="checkbox"/> Writing: Letters/Syllables (Phonics) <input type="checkbox"/> Writing: Single Words (Spelling) <input type="checkbox"/> Writing: Sentences <input type="checkbox"/> Composing A Story (Paragraph Or More)  <b>Other literacy related foci</b> <input type="checkbox"/> Speaking <input type="checkbox"/> Listening <input type="checkbox"/> Other  <b>Non-literacy</b> <input type="checkbox"/> Waiting <input type="checkbox"/> Drawing/Decorating/Crafting <input type="checkbox"/> Tidying up <input type="checkbox"/> Off-task  <b>The child is working with:</b> <input type="checkbox"/> alone <input type="checkbox"/> whole class <input type="checkbox"/> ..... # other students if in groups Mainly using: <input type="checkbox"/> English <input type="checkbox"/> Pijin <input type="checkbox"/> Other <input type="checkbox"/> None	<b>Reading</b> <input type="checkbox"/> Reading: Letters/Syllables (Phonics) <input type="checkbox"/> Reading: Single Words <input type="checkbox"/> Reading: Sentences <input type="checkbox"/> Reading Text Aloud <input type="checkbox"/> Reading Text Silently <input type="checkbox"/> Word Meanings (Vocabulary) <input type="checkbox"/> Comprehension  <b>Writing/Spelling</b> <input type="checkbox"/> Copying <input type="checkbox"/> Writing: Letters/Syllables (Phonics) <input type="checkbox"/> Writing: Single Words (Spelling) <input type="checkbox"/> Writing: Sentences <input type="checkbox"/> Composing A Story (Paragraph Or More)  <b>Other literacy related foci</b> <input type="checkbox"/> Speaking <input type="checkbox"/> Listening <input type="checkbox"/> Other  <b>Non-literacy</b> <input type="checkbox"/> Waiting <input type="checkbox"/> Drawing/Decorating/Crafting <input type="checkbox"/> Tidying up <input type="checkbox"/> Off-task  <b>The child is working with:</b> <input type="checkbox"/> alone <input type="checkbox"/> whole class <input type="checkbox"/> ..... # other students if in groups Mainly using: <input type="checkbox"/> English <input type="checkbox"/> Pijin <input type="checkbox"/> Other <input type="checkbox"/> None
		Researcher notes: Description of what students are doing and what sort of <b>opportunities to learn</b> are evident:	Researcher notes: Description of what students are doing and what sort of <b>opportunities to learn</b> are evident:	Researcher notes: Description of what students are doing and what sort of <b>opportunities to learn</b> are evident:	

Figure 1. Sample of classroom observation format



they were using. Pre-coded categories were posited initially at the workshop, and then refined through trialling in each country.

The development of understandings about the patterns of teaching and learning and the relationships between the two were sought in discussions between participants about the data in terms of the patterns observed in profiling. The initial descriptive analyses of the data collected in the profiling phase were used as the basis for ‘sense-making’ between participants. The ‘sense-making’ sessions occurred as the initial Professional Learning Community (PLC) meetings in each country with teachers and leaders from the participating schools (for a review of the features of PLC see Vescio, Ross & Adams, 2008). At these sessions the observation, interview and student achievement data were discussed, and importantly, the relationships between teachers’ actions (and use of resources), learning processes and learning outcomes were theorised. Teachers and leaders attended for a day long workshop, in geographically similar school groups. The shared development of theories was therefore a feature of the design, identifying participants’ understandings about constraints and enablers in context, desired changes to outcomes, and how these changes in outcomes would be the result of changes in learning processes and therefore teaching actions. The outcome of the sense making sessions was to develop theoretically explicit hypotheses about how the desired changes to students’ outcomes might be achieved.



*Figure 2. Types of feedback observed across two years*

The sense making sessions in each country can be conceived as ‘data discussions’ which, given the right conditions, have the potential to refine practice in ways that promote increases in student learning (Schildkamp, Lai & Earl, 2013). Through joint analysis of data, it was intended that teachers’ knowledge is broadened and deepened by reflecting on their practice, using the data about teaching as an artefact to drive that reflection, and using the data about student learning to drive purposeful inquiry. Using the classroom observation data as artefact offered both a mirror for reflection, but also a window into alternative approaches. The use of the agreed, precoded categories, and the resulting analysis of those categories, for example, allowed teachers to discuss alternatives to current practice based on the data. An example of this is shown in Figure 2. In this example, the quantities of different feedback types observed are displayed, indicating few instances of teachers giving ‘advice or next steps’. In this way, alternatives to current practice were a feature of the artefact, and are discussed as possibilities for desired shift.

### **Hypothesis generation**

The outcome of the sense making process was the development of contextually appropriate hypotheses. These hypotheses were designed to engage with teachers’ beliefs about the relationships between teaching and learning, as well as provide an intervention logic to test. In each of the three countries, the hypotheses were instantiated as changes that teachers would make to their practice, which would result in different types of participation or noticing from students, which would result in changes to learning outcomes. For example, in one country, the agreed shifts can be expressed in the following hypothesis: *if teachers highlight the use of letters and words to make meaning, students will have opportunities to compose personally meaningful stories, thus supporting their ability to write independently.* The shared agreement of the desired shifts to learning and the desired shifts in practice became the substance of the intervention in each country.

### **The implementation phase**

Implementing the desired changes was the focus of the second yearlong phase of the programme. In this phase, questions about the best systems to support teachers to change, and resources needed to do so were investigated, again through co-design. In each country, this entailed the development of teacher in-class assessment tools, the design of meeting structures to support opportunities for Professional Learning Communities and the development of texts to support the teachers’ literacy focus.

Teacher administered classroom assessment tools were designed in each country. Each was designed to allow teachers to identify student need and respond appropriately. Such tools included writing exemplars, rubrics, reading comprehension assessments and a ‘read and retell’ matrix for teachers. Each was co-designed by the in-country and external academic teams in a week long tool development workshop and trialled with teachers to investigate how the use of the tool might support teaching.

Teaching resources were also co-designed to support the focus in each country. In each country, the in country team identified what resources were already within the context, and where different resourcing might support the planned refinements to practice. The nature of texts required to meet that need were identified by the in-country teams, in consultation with external academics and publishers, and a subteam to develop them in each country was constituted. Examples of resources included wordless picture books that supported meaning making, use of language and story-retelling; home language readers to support first language development and literacy; dual language readers to support the addition of English language

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and literacy, and non fiction texts with thematic links to existing curriculum texts to support depth of concept development through language.

Meetings of the Professional Learning Communities were co-facilitated by in-country and external teams four to five times each year. At each meeting participants ideally worked to seek shared understandings about how tools and texts were used, what types of teaching activities worked well in context; how teachers knew that activities were working to change learning processes, whether changes constituted improvement for learners, and how to organise resources and systems so that the most effective teaching activities could be taken up by other teachers. In one country, local variation meant that in addition to meetings, the local facilitator held an 'in office' day once a week, where teachers could come and be supported with making resources and developing lesson plans. In other countries, PLCs were supplemented with classroom visits and co-teaching by in country facilitators and academics.

### **Sustainability**

Integral to the co-design of an intervention is a shared understanding of what might continue to operate within a context without the support of external teams. In the case of the three countries in the programme, the intent was to develop capability within the system to continue to improve the educational provision in country through the development of what might be considered 'improvement networks' (Bryk, 2015). For the intervention in each country, local facilitator and academic input was an essential part of the improvement network for schools. Thus, sustainability is likely to require the ongoing function of 'local' academics (which may be in-country based or regional as in the case of USP) to work in partnership with schools.

Based on the theoretical framework of the approach however, the dynamic and complex nature of context becomes an integral feature of any consideration of what might be sustained in each country. Within an improvement-focused approach to intervention, itself a dynamic process, the focus for sustainability of the design based intervention becomes the design, development and embedding of systems and processes to support ongoing teacher learning to promote student learning. Thus, within PLSLP, the approach to sustainability is not to seek an end-point where all teachers are trained and all students are learning at optimum levels, rather it is to work collectively towards a point where capability exists organisationally for a focus on continuous improvement with students' learning as the key goal for schools. As we enter the third and last year of implementation of PLSLP, we are working to gradually reduce the input of the external (University of Auckland based) support and to work with participating Ministries to ensure sources of ongoing resourcing for maintaining the local improvement networks beyond the end of the PLSLP funding. Therefore, the test of the PLSLP approach will come in 2018, when the participating schools, local academic partners and Ministries are left to maintain their local improvement networks and the processes associated with them, independently of external resourcing.

### **DISCUSSION**

The approach to international aid intervention design which we have taken draws on theoretical principles from education, schooling improvement and international aid, all of which cohere in acknowledging the dynamic, complex and constitutive nature of context for the learning of children, the professional development of teachers and the improvement of educational provision. Taken seriously, the acknowledgement of context within any design

results in a level of indeterminacy which needs to be accommodated within an intervention structure that is purposely designed to support improvement. Therefore a number of tensions exist between a pre-designed structure and implementation flexibility within a co-designed approach. Consideration of these tensions is needed to consider how the design based approach might contribute theoretically and in ways that have generalisability.

The first such tension is with the notion of treatment fidelity, in which adherence to the planned intervention is assessed (Smith, Daunic & Taylor, 2007). Classic intervention design would require checks of implementation to see whether the changes made to instruction were those that were planned, and whether outcomes are related to the degree to which the changes were implemented as planned. Because the PLSLP approach is specifically designed to be context specific, it becomes paradoxical to assess whether an intervention is ‘working’ in a specific or pre-determined way, and therefore likely to succeed. Our approach to addressing this issue has been the development of shared hypotheses in each country, which were co-designed and which were subsequently tested through changes in teaching approach supported by targeted resourcing. Thus the question of whether the intervention is succeeding is negotiated in response to data collection within each phase, in ‘sense making’ data discussions within Professional Learning Communities. The use of shared hypotheses enables testing of a theoretical principle within a specific context. Observation data are descriptive, and used formatively, in order that participants consider how their collective patterns on instruction might contribute to the students’ learning. These discussions are designed as a vehicle by which teachers consider their collective patterns of instruction, offering both a reflective mirror on current practice, and a window into possibilities for changes to practice.

Similarly, there is a tension with the notion of replication or ‘scale up’ within a co-designed, context specific approach. The assumption that ‘successful’ interventions in one context can be transferred and replicated in other contexts, whether within the same country or across national borders, is pervasive in international aid. Taking context seriously means that we focus on replication of a process of co-design, and on testing interventions within context, rather than on the exact replication of a design product. We argue that replication of the co-design approach to produce context-responsive interventions is possible, and allows a form of ‘scale-up’ that can support change across a system. However, the challenges and feasibility of managing such processes across a whole system are not yet researched.

Another tension is with the notion of ‘evidence based practice’ in order to determine whether changes to teaching are likely to be beneficial for student learning. Within PLSLP, the response to this issue is to draw on external and in country academic expertise, alongside the practice knowledge of those working with children to identify, and then scale, practices which are proving to be effective in context. Through data discussions in Professional Learning Communities, people with differing expertise consider descriptive evidence about teaching patterns and the relationships with learning processes and patterns. Thus the approach focusses on the function and outcomes of changes within the context, rather than imposing a set form of ‘best practice’ to be sought or replicated. In this way, the learning processes of children become the focus for the learning conversations between teachers, building the opportunity for contextually embedded learning for teachers.

In conclusion, we have argued here that in order to take seriously the need to develop a context specific international aid intervention, PLSLP has sought to acknowledge context as a dynamic and mutually constitutive part of the learning processes of children, of teachers and of complex systems such as schools. In order to embed context within an intervention

design, we have employed a Design Based Implementation Research framework, explicitly co-designing each phase of the iterative intervention to respond to the teaching and learning needs in each country, and acknowledging the multiple expertises required in such an endeavour. This approach is driven by a primary interest in what works best for whom and where, rather than what works best regardless of whom and where. As such, the concern for sustainability and for scale-up that dominates most aid interventions becomes an issue of building sustainable local improvement networks able to continue a contextually-driven process of collective problem solving for improvement.

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