School-university partnerships on the edge of possibility: Expansive learning and practice transformation across Australia, Nepal, and Bhutan

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Abstract

In this chapter, we analyse the life-cycle of international partnerships between an Australian university and universities and schools in Nepal and Bhutan. The collaboration placed the Australian university hosts in a distinctive role with special responsibilities of providing stimuli, engaging teachers and teacher educators in joint processes of working through contradictions, developing new ideas for practice, and supporting their embedding in institutional practices. Participants included researchers, teacher educators, in-service

teachers, pre-service teachers, and school students. The partnerships produced lasting positive changes that broke away from existing practices in ways that were often deemed unviable. Using Cultural-Historical Activity Theory (CHAT), we explore partnerships as a process of jointly creating new knowledge and artefacts that make new practices possible. Conflicts of motives were crucial – not between different partners, but between motives to enact engaging, inclusive pedagogies, and seemingly opposed motives to cover curriculum content. Participants were able to resolve this dilemma, develop models for new practices, and then implement these. The chapter highlights the expansive nature of the learning that can take place through school-university partnerships, offering wider lessons for those seeking to create school-university partnerships to transgress the status quo and realise what was previously considered impossible.

Introduction

How can school-university partnerships lead to change that might not otherwise have been deemed possible? This chapter explores school-university partnerships across Australia, Nepal, and Bhutan from a distinctive perspective that foregrounds conflicting and emerging motives, and how such partnerships can produce new actionable knowledge that underpins positive, lasting change in education settings. This makes school-university partnerships a matter of expansive learning – learning something that is not yet there (Engeström, 2016). This is not about the exchange of pre-existing knowledge between partners, but collectively producing knowledge that enables new practices, moving towards the viable unheard of (Liberali, 2019). This positions school-university partnerships at the edge of possibility, driving change in ways that individuals or organisations alone could not accomplish.

The partnerships enabled participants to define the difference between the status quo and what they felt ought to be, and to concretely pursue steps towards that preferred future. This simultaneous historical-and-future-oriented characteristic was produced by adopting a formative approach called a Change Laboratory (Engeström, 2007; Engeström et al., 2014), based on Cultural-Historical Activity Theory (CHAT) (Engeström & Sannino, 2021). We analyse the life-cycle of these partnerships in terms of how new cultural artefacts, linked to new motives, were produced, and in terms of the changing relationships partners had with those artefacts (Botha, 2017).

The partnerships involved a two-week intensive visit to the University of Technology Sydney (UTS) by teacher educators and in-service teachers from Nepal and Bhutan. Key developments in this phase are conveyed through two vignettes. After the visit, relationships between the Australian university, the universities in Nepal and Bhutan, and schools in Nepal and Bhutan developed along different trajectories, conveyed through vignettes presented later in the chapter. In Nepal, teacher educators supported teachers from a nearby school (who had not been part of the initial visit) to implement MicroProjects across the curriculum (Vignette 3). Bhutanese teachers who had visited UTS implemented game-based learning in mathematics in their schools, supported by local teacher educators, and pre-service teachers from UTS (Vignette 4).

We analyse the life-cycle of the partnerships in terms of the cycle of expansive learning, a cornerstone of CHAT. This looks less at the relationships themselves, and more at how the partnerships enabled progression from questioning and analysis to the creation, implementation, refinement, and embedding of new models in practice. Our focus is on how new knowledge is jointly created and taken up in practice as relationships between partners evolved.

The partnerships unfolded along paths that were not determined or anticipated in advance. The intention was to provide ‘interruptions’ to ways of working and relationships to create contexts for innovation and transformation (Bernay et al., 2020; Grundy et al., 2001; Jones et al., 2016). The Australian hosts were mindful of their partners from the global South, a term denoting largely low-income, politically marginalised countries in regions outside Europe, North America, and Australasia (Dados & Connell, 2012). UTS participants were conscious not to reproduce colonialist impositions or assumptions of deficits from a Western worldview. Instead, the process was designed to surface and pursue concrete alternatives that were derived through collaboration within and across cultural contexts. The partnerships operated as an opportunity to create conditions for conversations, questioning, envisioning, and practical experimentation that would not otherwise happen. The Australian hosts had an asymmetrical role in presenting facilitative prompts during partners’ time in Sydney, but the substantive results of this were co-produced by the visiting partners, and the directions they took upon return to Nepal or Bhutan were determined by those who would be driving change in those local contexts, with UTS partners continuing in a supportive and research-focused role. While the various projects that emerged through the partnerships do not reverse long standing legacies of colonialism and inequalities impacting the global South, we do suggest that they were decolonising in some regards in that they involved locally-generated alternatives that broke out of difficulties which can be traced to these historical features.

We begin by outlining the collaboration context and methods of data collection linked to it. We then introduce relevant aspects of the Nepali and Bhutanese contexts, before explaining key aspects of CHAT as a conceptual foundation for the analysis. Four vignettes are then presented, with commentaries on them revealing how the partnerships unfolded in different ways as expansive learning resulted in different motives, models, and artefacts. We conclude by reflecting on these partnerships in light of the broader themes and questions of this book, and the lessons our analysis offers for others hoping to build school-university partnerships that operate at the edge of what is possible in classrooms.

Collaboration context

The school-university partnerships considered here resulted from a grant from Australia's Department of Foreign Affairs and Trade (DFAT) in 2017. Funding supported a visit to Sydney by a group of eleven teacher educators and two teachers from Nepal and Bhutan. Specifically:

- five teacher educators from Kathmandu University School of Education (KUSOED), a self-funded, autonomous non-for-profit university in Nepal;
- two teacher educators from Tribhuvan University, a public university with campuses across Nepal;
- four teacher educators from the Royal University of Bhutan (two from Paro College of Education, which specialises in primary teacher education, and two from Samtse College of Education, which specialises in secondary teacher education);
- two school teachers from Paro, Bhutan (one from Taju, a primary school, and one from Khangkhu, a middle secondary school).

A fourteenth participant was a representative of an educational NGO based in Nepal, called the Sunrise Education Foundation, who supported dissemination activity through magazines distributed to teachers, news features, and online video features. Additional partners became involved after participants returned home, in particular Creative Academy, a low-fee private school in Kathmandu, offering education from Kindergarten to late secondary school. The contributors from UTS included teacher educators with specialisms in primary and secondary school levels, as well as researchers with expertise in professional learning and practice change.

Research data were collected throughout the partnerships. Participants were surveyed prior to visiting Sydney, capturing their experiences, frustrations and wishes as educators. Observation notes were taken during collaborative workshops held across the two-week visit to Sydney, and all artefacts created during this time (shared documents, notes added to flipcharts, whiteboards, etc.) were collected as data. Pedagogical resources created in Nepal and Bhutan, as well as examples of students' work, were added to the dataset as the projects unfolded in-country, supplemented by email dialogue capturing participants' experiences and evidencing practice change in the longer term. Figure 1 represents the phases of the partnerships.

Figure 1 Phases of the school-university partnerships

Educational context: Nepal and Bhutan

Nepal and Bhutan have distinct educational histories, and while their contemporary school and university systems have marked differences, there are also common challenges. Nepal has government schools alongside a large (both low-fee and elite) private sector. Nepal's relationship with India has strongly shaped its education system, syllabus, assessment, and other resources. Although never formally colonised by the West, Nganga et al. (2020) argue Nepal was 'ideologically colonised'; aspects of its education system have been influenced by a system that functioned to perpetuate colonial ruling structures in neighbouring India (Fagg, 2006; Shrestha, 2017). The continued use of English as a medium of instruction reflects this. In moves to decolonise education in Nepal, scholars have critiqued 'culturally decontextualised' education, particularly in subjects such as mathematics (Luitel, 2013).

Historically, education in Nepal has been highly centralised leaving teachers little power to decide what and how to teach. At the time of study, however, this was ostensibly changing through a new federal system, in which the school curriculum was designed by the federal government, leaving pedagogic practices and responsibility for hiring, supervising, and developing teachers to local government (Kunwar, 2020; Neupane, 2020). However, Hamal (2020) regards decentralisation as dubious rhetoric, expecting centralised control to remain the norm. As with many countries in the global South, access to education and quality of education remain key challenges in Nepal. The Nepal Education Policy (Ministry of Education, Science and Technology, 2076 [2019 in the Western or Gregorian calendar]) enshrines universal compulsory and free basic education. It highlights the need for inclusiveness and quality teaching-learning experiences. Gender disparities in enrolment attendance and school outcomes are significant, linked to financial barriers and girls' domestic workloads. Inequities relating to ethnicity, caste, and students with disabilities are also a matter of concern (Carney & Rappleye, 2011; Neupane, 2020; Nganga et al., 2020).

In Bhutan, education was solely monastic (related to the country's Buddhist foundations) until the 1960s. Now Bhutan has a system of over 700 schools, 24 tertiary institutes, and near universal enrolment – 95% in primary, 85% in secondary (Ministry of Education, 2014; Phuntsho, 2000; Tobden & Ham, 2022). Most students attend free government schools, with only a small private sector, concentrated around the capital, Thimphu, and Paro, a major town nearby. Features of Bhutanese education reflect the country's distinctive approach to governance (based on Gross National Happiness), Buddhist heritage, and managed engagement with the outside world. Having borrowed curriculum – and at times teachers – from India (again, colonial influences without formal colonisation), the government has developed its own curriculum, creating culturally specific textbooks and manuals (Childs et al., 2012; Rinchen, 2014; Royal Education Council, 2021). The *Bhutan Education Blueprint 2014-2024* (Ministry of Education, 2014) identifies priorities for educational improvement, including: upskilling teacher competencies, strengthening STEM education, diversifying offerings in secondary education, increasing access to tertiary education, and enhanced education for children with special needs. This is all under a broader aspiration of "education that inculcates an awareness of the nation's unique cultural heritage and ethical values as well as universal values that develop the capacity of the young people" (Ministry of Education, 2014, p. 10).

Despite historical and contemporary differences between education in Nepal and Bhutan, they have many challenges in common – and indeed shared with other countries in the global South (e.g., Dhendup & Sherab, 2023; Faikhamta et al., 2018; McDonald & Tufue-

Dolgoy, 2013). These include limited resources in the classroom, large class sizes, varied practice in inclusive education, access to learning technologies, and teachers' experience of pressure to cover curricular content within a limited time. These became key points of departure in the partnerships and are discussed in Vignette 1 below. Before this, the conceptual framework of CHAT will be outlined.

Theoretical framework and Change Laboratory

In this chapter we draw on Cultural-Historical Activity Theory (CHAT) (Engeström, 2007, 2016; Engeström & Sannino, 2021; Engeström et al., 2014). CHAT's focus on collective efforts is well-suited to exploring school-university partnerships. A still-evolving theory that has its roots in the work of Vygotsky and his colleague Leont'ev, CHAT promotes research that is activist and committed to positive change (Engeström & Sannino, 2021). CHAT has been used to understand collaboration between schools and universities in initial teacher education (Jakhelln & Postholm, 2022), and has been used as a basis for intervention research where university researchers have worked with teachers to change practices in schools (Engeström et al., 2023). The school-university partnerships in the present research, across three countries, represent a different formation and geographical location from those previously studied from this perspective.

CHAT offers the distinct concept of expansive learning. This involves people learning what is not yet there, rather than an exchange of existing ideas (Engeström, 2016). The term expansion relates to the *object* of collective activity – the problem that is being worked on, towards which actions are directed. The object is linked to motives, what matters to people in activity, why they expend effort, what they care about. The object in this case involved particular pedagogic practices, linked to a shared motive to radically change teaching and learning in the classroom. Expansive learning does not replace old understandings with new ones, but rather the object becomes understood in increasingly rich and complex ways, producing new practices, artefacts, and concepts (Engeström, 2022). In looking for evidence of expansive learning in school-university partnerships, we look for the way participants interpreted the object in new ways, developed new possibilities for action, and enriched the resources that might support those actions (Edwards & Mackenzie, 2005).

School-university partnerships are understood not purely in terms of institutional relationships, nor in terms of relationships between individuals, but rather in terms of

changes that involve and co-implicate particular people and the systems of which they are part (Engeström, 2022). In CHAT, such changes are driven by recognising and addressing contradictions in an activity system. The system is understood in terms of the subject, object, tools or artefacts, rules or norms, community, and division of labour (Engeström, 2016). We were thus interested in how participants could recognise contradictions that stood in the way of what they wanted to achieve, and the learning that unfolded as they collectively figured out how to resolve those contradictions. This is theorised in terms of double stimulation. The first stimulus is that which highlights a problem that connects to participants' motives, while the second (or auxiliary) stimulus refers to the means used to solve the problem (Engeström et al., 2014). A second stimulus is an artefact (idea or resource) that provides a platform for transformative action, the use of which is linked to new motives (Sannino, 2015). The second stimulus works by being attached to motives that provide a new basis for action, especially when people might be torn between wanting to do one thing and feeling they have to do another (Sannino, 2015), as was the case for participants in this project.

The notion of expansive learning offers a means to understand the life-cycle of school-university partnerships in a distinctive way. CHAT specifies learning actions that form an expansive cycle: questioning, analysing, modelling, examining/testing the model, implementing, reflecting, and consolidating (Engeström et al., 2014). Figure 1 represents this cycle with details relating specifically to this project. Applying this idea directs our attention less to how partnerships begin, evolve, and end, and more to how learning actions progress through a cycle that results in new insights, new resources, and new practices.

Figure 2 Cycle of expansive learning as applied in the project

A key means to trigger movement through such a cycle is referred to as a Change Laboratory, an interventionist research approach grounded in workshops in which participants are supported to recognise problems (contradictions, conflicts of motives), collaboratively develop and test new models, and buttress their sustained use in practice (Engeström, 2007). This hinges on participants gaining reflective distance from current practices in order to recognise problems with the status quo and then develop visions for alternatives (Virkkunen & Newnham, 2013). The initial survey sent to participants provoked such reflective distancing, and the workshops in Australia drew on Change Laboratory principles, including use of activity system representations, and various 'surfaces' – whiteboards and projections – reflecting past, present and future as second stimuli.

In what follows, we present four vignettes from the workshops and from what happened subsequently when participants returned to Nepal and Bhutan. Each is accompanied by an interpretive commentary, highlighting the expansive learning that unfolded through dynamic school-university partnerships. The vignettes are composites that draw on diverse data sources, including recordings of workshops, artefacts created during them, and testimonials provided by participants post-visit. They were drafted by the first two authors and revised as a result of comments provided by the remaining authors. The first two vignettes focus on the

UTS visit, while the third and fourth highlight different trajectories that unfolded post-visit (see Figure 1).

Vignette 1 Beginnings: collective reflective distance

Participants are examining their collective answers to questions about their own experiences of schooling, times they have been excited by things they have seen in the classroom, typical classroom practices in their context, and things that they would like to change (from the pre-visit phase, see Figure 1). Reading each other's responses, they draw out key ideas and add them to whiteboards under 'Past', 'Present', and 'Future'. Echoes from the past include experiences of not talking in class even though they had something to say. The present is characterised by phases such as 'chalk and talk' or 'lecture method', alongside ideas that school is generally 'not joyful for students' and that student talk is often dominated by boys, especially those seen as high achievers. Early outlines of the future highlight active learning, enjoyment, interest, and engagement, and more equitable contributions from all learners, who would also be realising their full potential, rather than confined by expectations based on judgements as to being high or low achievers. The group analyses why there is such a gap between the present and the desired future. They discuss how the pedagogies that teacher education encourages persist in the aims and values of teachers as they work in schools. However, the conditions of that work make enacting these pedagogies difficult. Some challenges relating to cultural norms for example around gender and caste – the latter in Nepal specifically – are considered. However, participants keep coming back to the same issue: The teaching is highly focused on content delivery to make sure that they cover everything. This severely limits the teachers' capacity to apply different learner centred approaches in the classroom. In both Nepal and Bhutan, curriculum demands are often associated with time pressures that leave teachers feeling they had no choice but to plough through content, rather than enacting more inclusive, engaging pedagogies.

The Australian university facilitators played a role in prompting participants to gain reflective distance from their own practices to create space for renewal and reinvention (Bernay et al., 2020; Jones et al., 2016; Perry et al., 2002). Consistent with Change Laboratory methods (Virkkunen & Newnham, 2013), this was done through the generation and collective examination of mirror data, using the survey to capture aspects of lived experience and envisioned futures. The group identified a problem (in CHAT terms, a first stimulus), and

recognised the need for change. They moved from this first step in the expansive learning cycle (see Figure 2) to the second, which involved more detailed analysis.

The analysis led to the idea that while teachers often wanted to teach differently, they felt trapped in didactic methods because of pressures to cover content. This was understood as a *contradiction* between the 'rules' (the requirements of the curriculum) and the 'object' (pedagogies that engage, involve, and support all learners). Their understanding shifted from one of a critical conflict (feeling guilty for not teaching in the desired way) to a double bind (being trapped by opposing motives) (Engeström & Sannino, 2011). Not covering the content posed unacceptable risks, but the status quo was critiqued as unacceptable, too.

A new purpose for the school-university partnerships emerged: working together to find ways to escape this bind. The jointness of this effort was strongly grounded in the questioning and analysis that was done together, in which participants saw themselves both in the problematic status quo, and as part of the solution towards a more desirable alternative future.

Vignette 2 Expanding the object

Participants begin exploring new models by discussing gender, inclusion, and theories of change. They visit several schools around Sydney, meeting students, talking with school leaders, and observing lessons.

The teachers and teacher educators identify two foundations of their model. The first is that 'teachers can make a difference', countering common feelings that change depended on others 'further up' (education officials, politicians) changing conditions like funding and curriculum. The second is that 'small things can have big effects' – substantial impacts on outcomes and experiences for students could come from changes that did not involve huge structural upheavals or additional work for teachers. These foundations establish a broad auxiliary motive: to develop tools for time-poor teachers that could engage all students equitably in the classroom.

Participants look at notes and displays made during the prior workshops and put forward a range of proposals to expand upon these foundations. Iterating between modelling and

refining the model through collective critique (see Figure 2), they arrive at eight principles, as shown in Figure 3. These principles combine established technical ideas (e.g., growth mindset, Dweck, 2006), more general notions (inclusiveness, playfulness, liveliness), and specific ideas developed in situ by the group. The latter includes 'concrete to abstract' which refers to frequent movement in lessons between concrete examples that are familiar and relevant to students and abstract thinking in a more conceptual realm. 'Stories' refers to helping students narrate aspects of their learning in order to foster reflective capability and to help share things such as when they get stuck, how they solved problems, and so on. 'Designing for praise and appreciation' points to practices that would saturate classrooms with opportunities to acknowledge students' accomplishments, not just for those who completed tasks correctly and quickly (which some participants are critical of in current practices).

Figure 3 Eight principles agreed upon by the participants

A number of important expansions to the object are evident in Vignette 2. While some of the eight principles involved ideas with which the participants were previously familiar, they were now folded into a system of related concepts that provided a new basis for action, and a new position from which to develop resources for use in practice.

Previously, high and equitable levels of engagement were regarded as desirable but impossible aspects of pedagogy (reflecting the contradiction between rules and object given pressures to deliver large volumes of content). The host university's (UTS) role was to create the context in which ideas could be encountered and explored – a context for innovation and transformation (Bernay et al., 2020; Grundy et al., 2001; Jones et al., 2016). Teacher educators from Nepal and Bhutan often drove the expansive discussion of these ideas by

drawing on their lived practice of engaging with more theoretical ideas, and as critical friends supporting existing teachers to develop their practice. The school teachers often contributed through stress testing ideas (a crucial expansive learning action, see Figure 2), keeping them grounded in what was feasible amid the constraints and pressures they were so familiar with. This was not a process of sharing ideas, or a cooperation to jointly deliver education for new teachers (Jakhelln & Postholm, 2022), but rather a process of collaboratively developing, challenging, and refining new ideas.

The result was that participants, particularly the school teachers, were no longer trapped by a conflict of motives: wanting to do one thing and feeling they had no choice but to do another. The eight principles formed the point of departure for escaping the double bind by being framed around things the participants agreed were within feasible reach and would also make a valuable difference to students' experiences and outcomes, while also delivering the curriculum.

Their expansive learning to this point had identified systemic contradictions and recognised a conflict of motives that had prevented practice change. Questioning, analysis, modelling, and testing (see Figure 2) had created a new set of concepts around which participants could imagine new actions being possible in the classroom. What remained was to use these as a basis to produce new cultural artefacts that could actually be used in practice. The third and fourth vignettes show how this unfolded in Nepal and Bhutan respectively, tracing new features of the school-university partnerships that developed in these contexts.

Vignette 3 MicroProjects in K-12 Education in Nepal

Two teacher educators from Kathmandu University School of Education (KUSOED) return to Nepal and establish a partnership with a school called Creative Academy. From this, two primary teachers become lead partners in developing and implementing 'MicroProjects', a concrete idea developed by the KUSOED team as a means to implement the eight principles. The teacher educators present a hypothetical example incorporating principles of project-based learning as they are enacted in their own practices at KUSOED: complex tasks; authentic, open-ended questions; real-world links; collaboration; critical thinking; decision-making; and opportunities to work autonomously (based on Thomas, 2000). The school teachers implement an adapted version in a Grade 2 mathematics class, asking

students in groups of three (mixed gender and ability) to set questions for peers, answer others' questions, and mark another group's work. This takes less time than anticipated, and the next iteration is more complex, using items the students had with them (pencils, rubbers etc.), as a basis for constructing graphs and creating questions. Subsequent iterations incorporate greater creative freedom, asking students to draw any item, and using these as a basis for mathematic questions.

The teachers and teacher educators then develop a MicroProject Design Template, which is given to teachers across the school, breaking down information about grade, focus, group size, duration (from minutes to maximum one lesson), step by step instructions, and reflective questions on ease/challenge of the work. MicroProjects are implemented in mathematics, science, English, ICT, and Art, across Grades 1 to 12. Three months after the workshops in Sydney, 50 MicroProjects have been developed and used in lessons in Nepal. Teachers share their experiences via email, demonstrating that MicroProjects are working as tools for time-poor teachers. Colleagues find them easy to implement in a lesson or less, while creating exciting teaching in which students are highly involved, allowing teachers to better support students needing extra attention. However, they express uncertainty about the difference between MicroProjects and other group-based activities or worksheets. The teachers and teacher educators develop a Helpsheet to clarify this, and a further 50 MicroProjects are implemented across grades and subjects.

The expansive learning cycle (Figure 2) continued in Nepal through a new school-university partnership between KUSOED teacher educators and teachers at Creative Academy. MicroProjects were implemented, reflected on, and consolidated as a tool for time-poor teachers to address the contradictions surrounding curriculum coverage. MicroProjects were acting as a second stimulus, an artefact used to solve the problem, associated with a new motive of enacting the eight principles through project-based learning in a compact timeframe. This partnership drove the cycle of expansive learning forward, now with the purpose of iteratively testing and refining MicroProjects as a feasible approach. This was not simply a ready-made solution handed to the school by the university. Instead, it required ongoing involvement of teachers and teacher educators. At first, the two teachers and two teacher educators worked between themselves to develop more complex versions of MicroProjects, generating the local knowledge and exemplars needed to inform the Design Template. Then the group's focus shifted to supporting wider implementation across the school before engaging in further reflection in light of other teachers' uncertainties and the

need to clarify MicroProjects in the Helpsheet. UTS collaborators acted as critical friends at these key moments.

Throughout this process, the school-university partnership continued joint work to resolve the conflict of motives relating to curriculum coverage, which left teachers feeling they did not have time to teach in ways they thought were desirable. The work between KUSOED and Creative Academy completed the cycle of expansive learning, iteratively moving between implementation, reflection, and consolidation (see Figure 2). This iteration was important – the idea of MicroProjects itself was refined by trying out examples in practice, and feedback from teachers across the school led to clarifications around what constitutes a MicroProject and how it could be differentiated from other classroom activities. This non-linear process drove expansions forward as the notion of MicroProjects was simultaneously enriched, its concrete manifestations diversified, and artefacts surrounding it were created (such as the Template and Helpsheet). In this way, the partnerships initiated in the Australian workshops provided a basis for a new school-university partnership in Nepal, where the seed of an idea was presented by teacher educators, and through sustained, close collaboration, became a feasible reality that moved practices closer to what those involved felt they ought to be. We note that very little resistance was encountered in implementing MicroProjects across the school. When asked, teachers involved reported strong support from school leadership, that they had confidence in MicroProjects because of the support from KUSOED and the demonstration of their viability by the lead teachers, and that they felt they addressed an authentic frustration (conflict of motives) that they felt in their daily practice.

Vignette 4 Changing pedagogies in primary Mathematics education in Bhutan

Two primary teachers from Bhutan observe games being used to engage students in collaborative learning in differentiated Mathematics lessons during their school visits in Sydney. They decide that they would like to design and implement a sequence of lessons that incorporate maths games on their return. Two participating teacher educators from Paro College of Education offer their support for this teaching innovation. The teachers develop games-based lessons to align with the Mathematics syllabus in Bhutan, grouping students within their classes so that they are playing the games with peers of similar ability.

Eighteen months later, two teacher educators from UTS travel to Paro with 9 primary pre-service teachers to complete an International Professional Experience placement. The UTS pre-service teachers are enrolled in their 3rd year of an undergraduate degree. The pre-service teachers and teacher educators purchase and create materials for sets of Mathematics games for the two schools in Paro, to support the two teachers in continuing to implement games-based learning. The materials include dice and task cards for dice games, bingo games, counters, hundred charts, mini-whiteboards and markers, and paddle pop sticks that can be used as counters or grouped in bundles. During their placements, the pre-service teachers design and teach Mathematics lessons that incorporate the games, so that the observing teachers can see how the games might be used (Figure 4). At one of the schools, one UTS teacher educator and some of the pre-service teachers co-design and deliver a professional learning session for the teachers across the school, to demonstrate and engage them in games they could use in the classroom. The resources are given to the schools for teachers to continue to use in their Mathematics lessons once the placement concludes.

Figure 4 Students in Paro, Bhutan engaging in a geometry lesson about properties of 2D shapes taught by pre-service teachers from Sydney, Australia

Here, the implementation of the eight principles focused on collaborative games-based learning within differentiated mathematics classrooms. The use of games in mathematics is increasingly widespread, but not straightforward for teachers, especially in challenging environments (Russo et al., 2021). The idea of using collaborative games functioned as a second stimulus, linked to a motive of finding ways to make games work in Bhutanese classrooms with students working at varied levels in mathematics. The key, in terms of the activity system, lay in selecting and developing appropriate artefacts – games that could function in the Bhutanese setting, and for which resources were available. The collaborative nature of the games also involved changing the division of labour in classrooms: the games involved new roles for the teachers, and new roles for students in groups set up specifically for the games. Just like MicroProjects, the games-based approach was a way of escaping the conflict of motives between what teachers wanted to do, pedagogically, and what they had previously thought was necessary given the demands and constraints they faced. While

games-based learning was not new, it was for those involved, a practice on the edge of possibility.

The school-university partnerships had to evolve in order to support this activity. The initial implementation was led by the two school teachers, with colleagues from the nearby university acting as critical friends, helping both to plan the games-based lessons (implementation; see Figure 2), and jointly review what happened (reflection; see Figure 2). Because these university partners had been with the teachers in Sydney, there was a shared understanding of the eight principles that the games-based approach was intended to uphold.

Those involved judged that these initial lessons went well and they were keen to expand the implementation of games-based approaches. At this point, UTS took on a new role, engaging pre-service teachers in the production of relevant materials, then trialling them in context during their placements in Bhutan, where their lessons were reviewed critically by a UTS-based teacher educator and the local teachers whose classes they were working in. In this way, further testing, implementation, and reflection led to the final consolidation, where the schools had several sets of resources for mathematical games, and a suite of lessons that had been planned, delivered, and critically considered.

Partnership between the schools and UTS was key to this process; what is striking is how different the roles and responsibilities were here, compared to the start. From UTS facilitating workshops, provoking questions to secure commitment to futures that were deemed impossible, to schools in Bhutan leading a distinct initiative where classroom practices transgressed established norms. From creating environments in which innovation and transformation could be conceived, UTS' role shifted to one of supporting implementation of and critical reflection on pedagogical practices that were designed by overseas school and university partners – in the case of Nepal, the practical idea of MicroProjects came from the teacher educators, while in Bhutan, it was school teachers who chose to focus on differentiation and games-based learning.

Conclusion

School-university partnerships are widely viewed as positive opportunities for collaboration, mutual benefit, and potential transformation (Bernay et al., 2020; Bradbury & Acquaro, 2022; Green et al., 2020). This chapter has upheld this broader view, offering a distinctive perspective on this mutual benefit not as some kind of reciprocal exchange which offers value to each partner, but rather as one of the joint production of new concepts and artefacts which enable significant changes in pedagogic practices. Rather than understanding partnerships as a particular kind of relationship between institutions or people in them, it framed school-university partnerships as a context for professional learning for all stakeholders – in-service teachers and teacher educators – and creation of new possibilities in practice. The partnerships were not simply joint missions to deliver something that neither party could do alone. Instead, they involved a collaborative intent to transcend the status quo. They were partnerships on the edge of possibility, accomplishing the viable unheard of (Liberali, 2019).

The international partnerships in focus here were complex and dynamic. Responsibilities and roles emerged and shifted, and new partners joined the process. Institutional relationships were not hierarchical, neither were they symmetrical. The Australian hosts (UTS) facilitated participants from school and university partners to gain reflective distance on their practices, a crucial step that led to them imagining alternative futures for practices and committing to making those viable. The participants who joined the process in Australia worked collaboratively but asymmetrically in developing a model that could provide the basis for practices that were desirable but previously deemed impossible. From this model of two foundational ideas (that teachers can make a difference, and small things can have big effects) and eight principles for time-poor teachers (see Figure 3), new possibilities for concrete action became within reach, taken up in distinctive ways in different contexts. In Nepal, university teacher educators established a new partnership with a local school, where pedagogies were radically reshaped by implementing MicroProjects across the curriculum. In Bhutan, teachers from schools led changes in practices, working with their local university partner as a broker offering critical friendship and enabling the original host to take a new role involving initial teacher education students in the production of and experimentation with new resources and practices.

Cultural-Historical Activity Theory (CHAT) provided a theoretical basis for the approach to working together, and for analysing the life cycle of the partnerships. The idea of expansive learning (Engeström, 2016) captures how partnerships push the edge of what is possible by enabling those involved to learn what is not yet there. While there is no ‘lead’ partner in a hierarchical sense of control, ownership, or having the answers, this process does depend

on responsibility being taken to create conditions in which the learning actions that drive expansions can occur (questioning, analysing, modelling, etc.). This was initiated by the Australian university host, but as the work progressed through the cycle, became increasingly the responsibility of partners (established and newly joined) in an iterative process of implementing ideas and refining them through practical experience. CHAT provides a robust foundation with a clear structure and process which is nonetheless flexible and open to significant changes and developments in the form that school-university partnerships take over time. The life cycle is not understood as an evolving relationship between institutions, but as a process of collaboratively producing culturally new concepts, artefacts, and practices (Engeström, 2022).

A CHAT approach also helps us think differently about motives in school-university partnerships. It shifts the focus from why stakeholders from different institutions would be involved in a partnership, to addressing conflicts of motives that hold practice back from positive change, and to the process through which new motives are developed across partners. This is key to partnerships that break away from the status quo. In this case, participants recognised that typical practices were not as they would want them to be, but that there was often no choice but to teach in ways that fell short in terms of engagement, equity, and inclusiveness, due to pressures from the curriculum. CHAT helps to recognise this dilemma for what it really is – not a matter of deficient practitioners, or something to feel guilty about, but a double bind (Engeström & Sannino, 2011) wherein teachers were trapped by opposing motives. The solution lies in developing new motives that escape this impossible framing – for these participants, these centred on motives to enact eight principles in ways that are feasible for time-poor teachers. This solution simultaneously addresses systemic contradictions (in this case between rules of the curriculum and the object of engaging, equitable, and inclusive practice), and thus embodies learning that is not only expansive, but also horizontal – not top down, or bottom up, but system-wide while deeply implicating, relying upon, and changing those involved (Engeström, 2022). Thus, through CHAT, motives in school-university partnerships are not just a matter of ‘Why be involved?’ but are central to what such partnerships can accomplish and how they do this. Motives lie at the heart of partnerships on the edge of possibility.

What are the lessons for those wishing to initiate school-university partnerships that operate at the edge of what is possible? The examples in this chapter, informed by CHAT, suggest that it can be helpful to pay attention to several key things. First, stability lies in the foundation of the process (expansive learning), rather than in the roles and responsibilities, or even in the institutions involved (which as we have shown, can change significantly). This

does not diminish the importance of clarity about roles, responsibilities, and institutional arrangements, but rather elevates the importance of founding the partnerships on commitments to jointly undertake actions of questioning, analysing, modelling, testing, implementing, reflecting, and consolidating – and to following where these lead. This may seem in contrast to views that favour stability in school-university partnerships, where its counter is instability that can lead to loss of shared focus, breakdown, or collapse (Brady, 2002; Handscomb et al., 2014; Farrell, 2023; Green et al., 2020). However, from a CHAT perspective, the value in partnerships lies in their dynamism, their movement through a cycle of expansive learning, because it is this movement (instability) that drives the creation of new ideas, concepts, and artefacts, and that makes new practices possible, which resonates with the notion of 'generative' or 'transformative' partnerships as discussed by Jones et al. (2016).

The second lesson relates to a readiness to confront what is uncomfortable, which is key if partnerships are to transcend the status quo and attain what is actually viable but not typically deemed so. This aligns with the intention that partnerships can stimulate interruptions to ways of working and contexts for innovation and transformation (Bernay et al., 2020; Grundy et al., 2001; Jones et al., 2016). Such confrontation begins with gaining reflective distance on current practices in order to critique them and collectively envision what ought to be. We recognise that feelings of guilt and entrapment can arise as partnerships throw into light why certain ways of doing things have historically been entrenched. This might go against expectations that building trust and secure relationships should focus on more positive or at least neutral ground, especially initially when participants might feel vulnerable in confronting difficult issues and openly criticising their own practices. However, we found that in fact such readiness to share vulnerabilities built trust and fuelled a shared commitment to change. The key was in creating a safe environment in which to do so. In this project, looking for patterns in written reflections shared by participants worked well, enabling them to highlight discomforts they had in common (see Vignette 1).

This leads to the third lesson: digging down to understand challenges systemically and in terms of potentially conflicting motives is crucial. Without addressing systemic contradictions, there runs a risk of workarounds that remain within present boundaries of the possible rather than fundamental resolutions that transgress those boundaries. Furthermore, identifying conflicts of motives is important in recognising why practices that participants feel ought to be different are hard to change. In this case, it was a conflict between delivering the curriculum or enacting engaging pedagogies. Recognising the conflict avoids a sense of blame or failure for not doing what should be done. Instead, it points to opposing, equally

valid forces that are indeed difficult to resolve. CHAT attaches great significance to conflicts of motives (Sannino, 2015), and crucially tells us the solution lies not in simply persuading people to change the weight they give to particular motives. Instead, it lies outside individuals, in the space between partners, where new motives can arise, linked to new concepts, artefacts, and practices.

Finally, encapsulating the spirit of CHAT, we feel it is important to establish and maintain a shared intention and commitment to seeking out and producing novelty, to venture into uncharted territory and take risks. This is not partnership as doing something together in which all parties benefit through reciprocal exchange of resources and ideas. It is about creating something new, learning together something that is not yet known, and embracing the uncertainty and unruliness that this involves - but also the truly radical potential of school-university partnerships that can break through the edges of what is possible.

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