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University and school research partnerships as a source of professional growth in regional communities

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Bibliographic citation

Swabey, Karen; Muir, Tracey; Thomas, Damon; Emery, Sherridan; Edwards, M-C (2021). University and school research partnerships as a source of professional growth in regional communities. University Of Tasmania. Journal contribution.

https://figshare.utas.edu.au/articles/journal_contribution/University_and_school_research_partnerships_as_a_s

Is published in: [10.1007/s13384-021-00477-1](https://doi.org/10.1007/s13384-021-00477-1)

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Title: Improving regional low SES students' learning and wellbeing through school-university partnerships: Case studies from three schools

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Abstract

There is increasing recognition of the importance of university and school research partnerships for developing approaches to supporting student learning and wellbeing. However, this is a relatively under-explored area of research particularly in regional community contexts. Drawing on data from a three-year study of learning and wellbeing in low SES regional schools, this paper focuses on research partnerships between a regional university and three regional government schools in the Australian state of Tasmania. The three case studies presented consider the diverse ways that university and school partnerships can serve as catalysts for teachers' professional experimentation within their classroom practice.

Introduction

Improving regional low socio-economic (SES) students' chances to achieve socially just outcomes remains a significant challenge in Australia. Educators increasingly recognise the need to address the academic achievement and wellbeing disparities encountered by low socioeconomic status primary and secondary students, including in regional settings (Halsey 2018; Heckman and Masterov 2007; OECD 2010; Prain et al. 2018). There is a need for research-based evidence of the effects of interdependent systemic strategies to address educational disadvantage in Australia (Emerson, Fear, Fox, and Sanders 2012; Productivity Commission 2012). School-university partnerships are one such systemic strategy.

This paper reports on a research partnership between a regional university and three regional government schools in one Australian state as part of a larger study funded by the Australian Research Council (ARC) (2016-2019). The research aimed to identify conditions that enhance regional low SES primary and secondary students' learning and wellbeing in eight participant schools in regional Victoria and Tasmania. This paper focusses on the Tasmanian experience. Our previous research findings and increasing concerns about student wellbeing led to the present study in which we analysed curriculum strategies and outcomes linked to five key research pillars when teachers sought to: (a) personalise student learning; (b) support student and teacher wellbeing; (c) teach in teams; (d) utilise the affordances of larger, non-traditional learning spaces; and (e) incorporate student use of ICTs to enhance learning.

Recognising that some of these areas are complex and difficult for teachers to navigate, the university and school partnerships in this study were designed to support teachers within their own teaching contexts to extend their practice within their chosen focus areas. Teaching teams at the three participant schools in Tasmania each selected a different area of focus for the university and school partnership, and the university researchers supported teachers as they experimented with new approaches and extended their practice.

Researchers and teachers engaged in sustained shared thinking about the outcomes of the changes in practice and developed ideas about further adapting their approaches in response to what emerged.

Literature Review

Regionality and rurality are associated with both socioeconomic and educational disadvantage (Corbett and Forsey 2017; Cuervo 2016). The state of Tasmania is classified as regional with some parts further designated as remote, and education outcomes in the state have traditionally trailed national outcomes. Most recent census data show that of people aged 15 and over in Tasmania, 17.4% reported having completed Year 10 as their highest level of educational attainment, a far higher proportion than the national figure of 10.8%. (Australian Bureau of Statistics [ABS] 2016). The census data further reveal that lower proportions of young people in Tasmania complete Year 12 or attain an undergraduate qualification than in Australia more broadly (ABS 2016). Rowan and Ramsay (2018) mapped Tasmanian students' NAPLAN data revealing large inequities in education outcomes, particularly in low socioeconomic regional areas. In acknowledging the persistence of regional and rural disadvantage, the project reported in this article identified the importance of locally developed interventions to support learning and wellbeing in the three participating schools. There was a further priority placed on partnerships between regional universities and schools, as a means of supporting and evaluating locally developed interventions that were relevant to the participating schools, teachers and students, and which drew upon the expertise and interests of the researchers.

School and university partnerships are not a new phenomenon; schools and universities have formed educational partnerships for many years (Bartholomew and Sandholtz 2009). Traditionally, universities held most power in these arrangements, yet

recent conceptualisations of school-university partnerships have placed greater emphasis on teachers as knowledge generators and co-researchers (Cramp and Khan 2019; Geiger, Muir and Lamb 2016), and there has been “a genuine interest in seeing knowledge production as a shared responsibility of the practitioner and research communities” (Bickel and Hatstrup 1995, p. 36).

Strong school-university partnerships are beneficial to both parties. These partnerships can enhance practising teachers’ professional development (Cramp and Khan 2019; Sexton and Downton 2014), lead to the sharing of resources in mutually beneficial ways (Borthwick and Dickens 2013), and increase professional interactions with colleagues (Cramp and Khan 2019). A key benefit of strong school-university partnerships is the creation of new and pedagogically useful knowledge. Bickel and Hatstrup (1995) contend that sustained collaboration between teachers and researchers is “a valuable mechanism for accessing and synthesizing what each community knows about improving educational outcomes” (p. 37).

Yet forming and sustaining strong school-university partnerships is challenging for a variety of reasons. Questions arise such as, who sets the agenda, who has power for making decisions, and what processes are followed to deal with tensions and viewpoints inherent in such arrangements? Logistical issues such as time and institutional differences are described by Bartholomew and Sandholtz (2009) as the main challenges facing school-university partnerships. While collaborations between teachers and researchers can be valuable for education stakeholders, they typically take a large amount of time and energy to see returns (Davies et al. 2007). As well as logistical issues, school-university partnerships face challenges caused by inherent institutional differences. School systems and universities have cultural differences that relate to experiences, values and incentive systems, which can make collaboration between the two difficult (McLaughlin and Black-Hawkins 2007).

Research into effective school-university partnerships has determined that certain decisions and processes can increase the likelihood that they will achieve their aims and benefit both parties. Much of this relates to decisions about roles of participants in the planning, implementation and dissemination of knowledge generated through collaborative initiatives. Cochran-Smith and Lytle (1999) advocated for an equity in status between researchers and teachers, with both functioning as fellow learners and researchers instead of experts and novices.

Beyond roles, strong school-university partnerships meet the interests of both parties. Sexton and Downton (2014) found that school-university partnerships that were mutually beneficial were those that had a clear organisational structure, a core group of people collaborating, significant commitments of time, energy and flexibility to modify plans, a recognition of how schools typically function, a willingness to work through conflicts that occurred, and trust and pride in the outcomes of the partnership.

In considering how university and school partnerships in regional communities might support teachers as they support student learning and wellbeing, we next outline three case studies chosen to demonstrate some of the possibilities such partnerships afford.

Methodology

The study reported in this paper builds on the findings from a previous research project which investigated interventions in low socioeconomic regional schools that support student learning and wellbeing; namely personalised learning, the use of digital technologies, flexible use of learning spaces, team teaching, and a focus on student wellbeing. The University of Tasmania Human Research Ethics Committee provided ethical approval (Ethics Ref No: H0015448) for the study protocols, and all participants provided informed consent prior to participation.

This research is not an evaluation of university designed PL courses. Rather, the present overarching ARC study entailed longitudinal, multi-phased mixed methods (Creswell 2014; Teddlie and Tashakkori 2009) which analysed the strategies and the recursive refinement of these strategies within and across school sites (2016-2019). The research team initiated new university and school partnerships with the aim of supporting students' learning and wellbeing in low SES regional schools in the northern part of the state. This research entailed an interpretive cycle whereby observations and teacher insights and practice, gleaned from interviews and network meetings, progressively fed into the research findings and forward planning. The methodology was flexible and reflexive such that each cycle of planning and interpretation influenced further planning and data collection. The data included responses to questionnaires, interviews with students, teachers and principals, in-class observations, video capture, and a range of documents from teachers and students. These research techniques were context- and participant-sensitive to enhance the credibility and authenticity of the research and the trustworthiness of the outcomes both for participants and to those reading the research (Guba and Lincoln 2005). At the outset of the project the investigators conducted site visits to establish the approach, put support structures in place, established how collaboration and review across sites was to occur, and supported distribution of expertise among participant principals, teachers and researchers. Each year, a combined workshop for principals and participant teachers from each school was provided, rotating through the sites, so that they understood the scope and nature of the project, received assistance in interpreting data, and learnt from each site through exchange of initiatives and achievements.

In addition to the methodology described above, the three case studies in Tasmania used design-based research (DBR) as a supplementary methodology. DBR, as described by Anderson and Shattuck (2012), is situated in a real context, focussed on the design and

testing of a significant intervention, uses mixed methods, and involves multiple iterations and collaborative partnerships between researchers and practitioners. All three case studies met these criteria and benefitted from the flexibility this methodology afforded within the school contexts.

Following typical DBR procedures (Design-Based Research Collective 2003), the development and research in each case study took place through iterative cycles of design, enactment, analysis, and redesign. All data were analysed thematically to identify underlying ideas, assumptions and conceptualisations in the data (Braun and Clarke 2006). Research team members facilitating each case noted key themes in the data, with the thematic analysis proceeding inductively from the data and forming the basis of the findings. Findings were structured according to factors that enabled and constrained the key objectives of each case.

Underpinning the overarching ARC study methodology was the focus on curricular strategies linked to five research pillars: personalised learning, student and teacher wellbeing, team planning and teaching, flexible use of space, and use of digital technologies. The foci of the three case studies reported in this paper are outlined in the case characteristics table.

(Table 1).

Table 1. Case characteristics

Case study	School pseudonym	School year range	No of teacher participants	Focus of the university – school partnership	Research methods employed
1	Mallee Primary School	Primary K-6	6	Focus on team teaching; study conducted with all Year 5-6 classroom teachers.	Questionnaires, Interviews with students, teachers and school leaders In-class observations Video capture Documentary evidence

2	Beech High School	Secondary 7-10	8	Focus on use of digital technologies; study conducted with all Year 7 English teachers.	Interviews with students, teachers and school leaders In-class observations
3	Teatree Primary School	Primary K-6	8 teacher video participants 28 survey participants	Focus on wellbeing of teaching staff; study conducted with Kindergarten to Year 6 teachers and administrators	Questionnaires One-on-one video-based learning conversations Group conversations

The Index of Community Socio Economic Advantage (ICSEA) (MySchool, 2018) data showed a range from 850-970 and the school populations ranged from 300-450.

The data collected for the three Tasmanian case studies were qualitative in nature and involved the following, as detailed in Table 1: responses to questionnaires; interviews with students, teachers and school leaders; in-class observations; video capture; and a range of documents from teachers and students. The findings reported in this article draw on the interviews conducted with teachers and the document analysis. The data were analysed using the Interconnected Model of Teacher Professional Growth (IMTPG, see Figure 1) as a lens for focussing on the research partnerships between the university researchers and teachers.

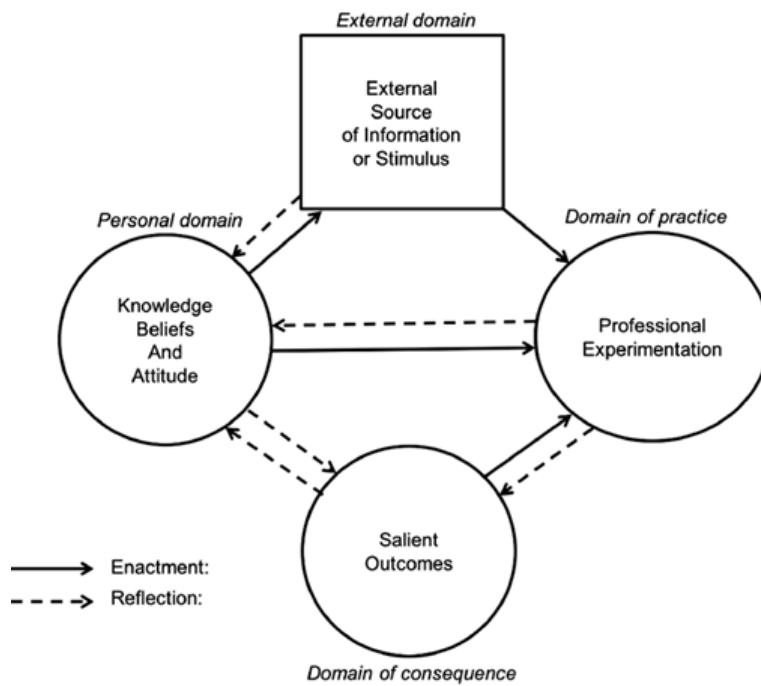


Figure 1. The interconnected model of teacher professional growth (Clarke and Hollingsworth 2002).

Within this model, teacher professional growth is conceptualised as involving reciprocal relationships between four domains: (1) the Personal domain, of teachers' knowledge, beliefs and attitudes; (2) the External domain, which involves external sources of information or stimuli; (3) the Domain of Practice, involving professional experimentation; and (4) the Domain of Consequence, which are the salient outcomes that occur in classroom practice (Clarke and Hollingsworth 2002; van Tartwijk, Zwart and Wubbels 2017). In particular, the three school partnerships that are the focus of this article are [depicted] as stimuli in the external domain of the teachers' professional world.

Case Studies

Case Study 1: Mallee Primary School

The first case study examined how teachers capitalised on mathematics test results to personalise upper primary students' mathematics learning. Student agency was supported through discussing their strengths and weaknesses as revealed by the tests, and setting

personal goals for their mathematics learning. Results showed that students were able to articulate purposeful mathematical goals and were motivated to engage in mathematical experiences to help them achieve their goals.

Mallee Primary School is a regional, low SES school located in a rural farming town in northern Tasmania. Over the course of the project, four Year 5/6 classes (approximately 11-12 years of age) of about 30 students participated in the research each year. Mallee Primary School selected personalising mathematics learning as their individual project, with a specific focus on team teaching.

In the university-school partnership, the researcher's role at Mallee Primary School was partly observer, participant-observer, and an external source of information or stimulus (Clarke and Hollingsworth 2002). Beginning in 2017, the researcher met each term with the Year 5/6 teachers and school leaders to identify the mathematical focus or topic for that term. The researcher and teachers worked collaboratively to develop a pre-test on the topic which was administered to all students. The teachers marked the tests and organised the 120 students into four similar ability groups based on the results. They also conducted interviews with the students to share individual test results and have students write their personal goals for mathematics learning. With the support of the researcher, the teachers collaboratively, then individually, planned experiences for the whole cohort of 120 students.

In addition to 'regular' mathematics classes, 2-3 sessions were planned weekly where all students gathered in the Performing Arts Centre (PAC) space. PAC maths (as it came to be called) involved a 15-20-minute session which was planned for and led by one of the teachers. Typically, the sessions involved familiarising students with aspects of the relevant mathematical topic for that cycle. Topics covered during the project included fractions, decimals, place value, time, and mental computation. When focussing on mental computation, for example, students were introduced to strategies, provided with problems to

calculate mentally, and then participated in whole group sharing of selected students' strategies. Students used individual whiteboards to record their thinking. Following the whole group session, students were split into their four groups and moved to their allocated teacher's classroom. Each teacher was responsible for providing targeted instruction for their group. The experiences for each group were similar, with the learning differentiated according to students' needs. The teaching of mathematics continued in this way for 4-6 weeks, and then students were given a post-test. Results were again discussed between the teachers and the students, and a new focus was identified.

Results gathered from interviews with participants showed that students and teachers were enthusiastic about the PAC maths approach. There was evidence that teachers experienced professional growth that was influenced by an external source of information or stimulus (the researcher and/or other schools in the project); professional experimentation and salient outcomes (Clarke and Hollingsworth 2002). The researcher acted as an external source of information through supporting teachers with the adoption of contemporary mathematical practices, along with providing them with a stimulus to think about their practice as mathematics teachers. Throughout the implementation of the design phases, the researcher was present in whole group, small group and planning sessions. The impact of the researcher was evident in the following illustrative comment:

It was a bit of an eye-opener when you were in here one day ... because we've always been getting them to, "Show your thinking." and then one day you said, "Well, some of the kids do like just doing it in their heads and putting their answer down because we're doing a lot of whiteboard work" and I thought, "Oh yeah." I've always been saying, "Show your thinking, your steps of thinking" but if they know it's seven straight away, it doesn't really matter what's happening in their

head, which was interesting for me to realise. They don't have to always show their thinking. (Julie)

Visits to other school sites that were part of the project were also influential in adopting practices, such as the focus on the design of learning spaces and the use of student data: "We know the students' data so why aren't we sharing it with them? It is about growth, and the data are used to help inform us so that we achieve that growth." (Troy)

The PAC maths approach allowed for professional experimentation – the teachers at Mallee Primary School adapted their practice from a class-based approach to a whole cohort approach that involved adopting a shared responsibility for teaching mathematics. Team planning sessions provided opportunities for teachers to share experiences about their new ways of teaching approaches to mathematics:

The strategies that we've named up and the language that's been associated with them has started to come through. So that's been good. My group takes a little bit longer but they can use the words to describe how they've solved it. (Cathy)

Salient outcomes were evidenced through the teachers noticing that through the university school research partnership they had achieved some success with getting students to use multiple strategies for finding solutions to maths problems. For example, after completing the cycle on mental computation, Julie noted that "All students bar one achieved growth, and the growth ranged from improving by 2 to some getting 30 or more. Andrew went from 50 to 89 and even Evan improved by 25". She commented:

The first time I gave them the test, a lot of them just really didn't know how to – like the detective question, they didn't know what they were looking for and they didn't know how to answer a question two ways. Because we've taught them that, I think they had more of a go at the [post] test.

The following comment suggests there was increased enthusiasm for teaching and learning mathematics:

We've had very little behaviour management ... the kids have really coped with it. There's been no complaints. When it's PAC maths, they don't go, "Oh..." They say, "Oh, PAC maths is what we're doing" and I think it's been good in the sessions that we do have together that they realise that sometimes we can be so isolated in our rooms, "Oh, we're all learning this." That's quite a powerful thing.
(Jane, Grade 5/6 teacher)

In terms of constraints, the biggest challenges were allocating time for collaborative planning and reflection to occur, along with some initial reluctance by some teachers to lead the whole cohort sessions. Overall, however, the results from this case study demonstrate that professional growth occurred as a result of external input, professional experimentation, and experiencing salient outcomes. Shifts in teachers' knowledge, beliefs and attitudes occurred as they observed the benefits of the approach and as they engaged in regular reflection and discussions to collaboratively plan the cycles of instruction. Student data demonstrated growth in mathematical knowledge, which, along with increased enthusiasm for the teaching and learning of mathematics, provided motivation for teachers to continue with the approach. Throughout the process, the researcher provided support through regular visits, emails and provision of resources. Regular check-ins with the teachers and monitoring of progress as enacted through the DBR process also helped to facilitate the university-school partnership.

Case Study 2: Beech High School

This case study involved a secondary school in which a 1-to-1 iPad strategy was implemented as part of a substantial revision of how to engage students and their parents in learning. Teachers collaboratively planned and recorded units of work, delivering these to

students via a learning content management system named Canvas. Students selected tasks of varying difficulty and parents could track their progress and communicate with teachers electronically. Early findings indicate that this approach improved student engagement, connectedness to school and teachers, and parental involvement.

Beech High School, located in a regional city in northern Tasmania, has an ICSEA below the national average of 1000. Throughout the project, staff from Beech High School worked with the research team to implement a range of teaching and learning innovations. In line with the school's priorities, the 2019 focus for the university-school partnership was the implementation of digital technology for the Year 7 cohort, representing a 'step-change' in the school's approach to the integration of technology in the classroom. In previous years, the use of digital technology at the school was problematic, with two shared laptop trolleys, poor Internet infrastructure, and slow computers leading to frustration for students and teachers. In 2019, the input of professional expertise provided by the university researchers involved evaluating the iPad strategy implementation and sharing information with the Year 7 teaching team.

The iPad strategy was designed to support the personalising of learning for the new Year 7 cohort and it evolved through two iterations; its first in Term 1 and second in Term 2 (with each term lasting 10 weeks). To gain teacher, student, school leader, and researcher perspectives, data collection involved three interviews with the Year 7 leader, interviews with students of mixed ability (six in Term 1 and three in Term 2), a survey of the Year 7 teaching team attitudes at the end of each term, and two classroom observations per term. The researchers sought to investigate factors that enabled and constrained the personalisation of student learning through the strategy. The researchers provided a consistent point of contact and ongoing discussions and feedback, anchored in the aligned purposes of school priorities and the wider ARC project.

At the end of both iterations the researchers met with the Year 7 teachers, the Year 7 leader, and the school principal to feed back the combined findings from the teacher survey, student interviews and classroom observations. Following each classroom observation, the researchers also engaged in critical reflective conversations with the Year 7 leader with a focus on how the observed practices related to the objectives of the case study, which she then fed back to the teaching team. This enabled the researchers to contribute to the ongoing evaluation and refinement of the strategy's design.

Drawing on all methods of data collection, the following three factors enabled the personalisation of student learning:

1. *Student agency over pace and challenge of learning*: Students could engage in 'anywhere, anytime' learning using mobile technology and had instant access to learning instructions during lessons to clarify teacher expectations. In certain subjects, teachers provided students with banks of questions at different levels of challenge, allowing them to complete questions they felt were at "the right level" (Student interview comment).
2. *New ways to communicate about learning and assessment*: Students shared their learning more actively with their classmates, teachers and parents through the Canvas discussion forums and ePortfolios. Students perceived that the ePortfolios enabled students to easily share their learning with parents. One student commented, "It's much easier to show them what you're working on than to have to try and explain it".
3. *A more enjoyable learning experience*: Five of the nine interviewed students commented on the raw appeal of using the iPads, which were "fun for learning" when compared with traditional approaches. When asked how teachers might improve the experience, one student commented "I wish we could use them for all aspects of our learning".

The three enablers, when combined, led to more engaging, meaningful learning experiences for the Year 7 cohort. All students interviewed were positive about the iPads and their impact on learning and convenience in classroom and home settings. As with any major change to established practices, however, there were (at least) four elements in the strategy that constrained the personalisation of learning:

1. *Technical issues*: Iteration 1 was characterised by technical glitches, such as some students not having access to required applications, teachers lacking knowledge about iPad versions of apps, students forgetting iPads or not charging their devices. Technical issues were less apparent in Iteration 2.
2. *Student distraction*: Students and teachers commented on various minor misuses of iPads that distracted students from learning (e.g., airdropping images, searching for memes). Student interview comments suggested staff monitored such behaviours, leading to a culture of tight control. Students were unable to access the Apple Appstore, limiting the potential for using iPads as learning tools and tools for disruption simultaneously.
3. *Low-level uses of iPads*: Interviews with the Year 7 leader and classroom observations revealed low-level usage of the iPads, with an operational focus. The Year 7 leader expected to engage students in more advanced use of the iPads in the future to leverage the affordances of mobile learning for personalised experiences. The school had no clear strategy for upskilling staff who were unfamiliar with teaching with technology.
4. *Lack of planning time for teaching teams*: Teachers at the school engaged in professional learning communities (PLCs) where they discussed student data and reflected on units of work, however they lacked time in school hours to collaboratively plan, edit or upload content to Canvas. The lack of planning time, and

lack of distributed leadership amongst the teaching team, increased the pressure on the Year 7 leader to implement and progress the strategy.

While 1-to-1 technology plans are commonplace in many schools nationally and internationally, the iPad strategy at Beech High School represented a major attempt to improve learning conditions for students in regional Tasmania. The university and school partnership enabled the evaluation of the implementation of the strategy and teachers commented on the benefits of this approach where the research focussed on challenges relevant to the teaching staff. One teacher commented,

The alignment of our school priorities with the research goals...supported our partnership by providing a clear focus and allowing staff to see that this was not another new project but a grant that would assist us in supporting what we, as a school, are aiming to achieve.

The evaluation revealed feelings of optimism from students about having iPads and Canvas as learning tools, fostering more self-paced learning, choice over levels of challenge in certain subjects, increased access to information, additional ways to communicate with peers, teachers and parents, and a more enjoyable learning experience. These were some of the salient outcomes of the teachers' professional experimentation with the implementation of the iPad strategy in their domain of practice. While more advanced uses of digital technology may be found in other settings, this school's first foray into the world of increased access, ePortfolios and online discussions led to a more personalised and accountable learning experience for students.

Yet the student optimism was in contrast with other outcomes in the domain of consequence such as teacher frustrations about technical issues, relatively low-level uses of the iPads for teaching and learning, and, perhaps most concerning, a lack of any system-level processes for supporting high quality teaching and learning in all classrooms. The research

partnership between the university researchers and Year 7 teaching team and the discussions of findings from the teacher survey revealed surfaced many perspectives about the iPad strategy. The team discussed the need for a model of distributed leadership for the Year 7 teaching team around the iPad strategy, including the planning and editing of content for Canvas, coupled with time for planning in school hours. Benefits were discussed of a deprivatised approach that “changes culture and practice so that teachers observe other teachers, are observed by others, and participate in informed and telling debate on the quality and effectiveness of their instruction” (Fullan 2007, p. 36) allowing for teachers with greater proficiency in teaching with mobile devices to work side-by-side with others who are less proficient. This type of collegial expert input may present opportunities for engaging in professional experimentation expanding the potential for digital technology to transform and personalise learning.

Case Study 3: Teatree Primary School

The third case study conducted at Teatree Primary School, addressed the pillars of personalised learning and wellbeing with a focus on the teachers. Teatree Primary School is a regional K-6 school, located in Tasmania and as the data reported in Table 1 show, the school is among the least advantaged in the state. Due to the inherent stressors within this context, there was strong motivation from staff to engage in learning about managing their own stress through learning about and applying self-regulation knowledge and skills.

The teachers and teacher leaders at Teatree Primary School cycled through three iterations of personalised professional learning on self-regulation in an effort to support their own stress management. This learning was based on Self-Reg Theory (Shanker 2010, 2017) and complemented other professional learning occurring concurrently within the school. In each iteration invitations were extended for teachers to be videoed within their learning spaces and engage in one-on-one learning conversations to connect the professional learning

to their classroom practice. As a part of their professional experimentation within this study, at the end of each iteration, teachers reviewed their learning, shared experiences of learning from the video capture initiative (viewing and discussing their own in Iteration 1 and 2 or viewing and discussing a colleague's in Iteration 3) and completed a questionnaire.

The university researcher collaboratively designed the professional learning with school representatives to respond to staff requests in both content and mode. The researcher provided an input of professional expertise as professional learning facilitator, videographer, and self-regulation teaching and learning mentor and observer (Clarke and Hollingsworth, 2002). The personal nature of the professional learning invited vulnerability and trust, making understanding the context and relationship-building prerequisites leading into and during the study. Furthermore, collaboration with participants, facilitating learning, and mentoring, required researcher reflexivity in data collection and analysis (Berger 2015).

Four distinct phases framed this study; an anticipatory phase referred to as Iteration 0; followed by three research phases referred to as Iterations 1, 2 and 3. Iteration 0 occurred over the first year of the study. The focus of this iteration was to establish a relationship between the university researchers and school research participants. This included multiple site visits by the researchers to gain an understanding of the research context, build relationships with participants, and establish a foundational understanding of the brain-body response to stress and the five domains of stress (Shanker and Barker 2016). Iteration 1, 2 and 3 aligned with the first three 10-week school terms the following year. Each of these iterations had the following structure across the term:

- Personalised professional learning (beginning of the term)
- Video mentoring (mid-term)
- Review and questionnaire (at the end of the term)

This structure allowed data from each iteration to inform the design and content of the next iteration.

Teacher needs guided university research decisions regarding the content and mode of the professional learning over the three iterations with the number of teachers volunteering to be videoed and mentored increasing from three to eight over the course of the study. Each iteration drew data from video mentoring learning conversations, group discussions, and questionnaires. The data were analysed to identify participants' perceived growth in managing stressors as a result of self-regulation learning and themes of what enables and constrains this learning.

Participants reported growth in their ability to manage stressors across all questionnaires. This included growth in knowledge and skills as well as reported application. Examples of growth from data collected in Iteration 2 include the following comments from participants: One teacher referred to a growing self-awareness of her stress response, "I have become much more aware of when I need to implement self-reg strategies when dealing with high stress situations." Another teacher commented on her use of self-regulation strategies, "Before I would go home and not have anything on, now I go to the gym, cook, walk, I chuck on the headphones and listen to podcasts or music."

Participants reported growth in knowledge, skills, and application of self-regulation over the year. Themes identified around the constraints to the learning and application of self-regulation included:

- time – lack of time to learn or apply;
- energy – high stress situations are energy depleting, rendering it difficult to learn or apply self-regulation;

- isolation – when alone with a class it is difficult to get the support needed in high stress situations, self-regulation is difficult if no one is there to coregulate; and
- the intensity of the negative stressors experienced within the learning context – some situations create a threat response for teachers making it difficult to self-regulate.

The data analysis highlighted the following factors enabling the learning and application of self-regulation:

- social interaction – learning together as a team enhanced the experience;
- video feedback – although being videoed for some was daunting, all video participants commented on the value of the experience and the learning that came from the feedback and learning conversations;
- curiosity in the topic – learning about how the brain and body responds to stress and self-regulation made the learning interesting;
- distinguishing between stress behaviour and misbehaviour – this distinction helped participants understand their own behaviours and respond differently to the behaviour of others; and
- practice – with greater understanding, self-awareness through reflection on their own and others' self-regulation practices occurred.

This case study provided insight into how a university – school partnership resulted in the positive outcomes for both parties. The school benefited from professional learning resulting in the development of teachers' understanding of self-regulation to enhance stress management. In the domain of practice, teachers demonstrated growth in their understanding of the physiological responses to stress, ability to identify their own stressors, capacity to apply strategies to reduce these stressors, and support students through coregulation. Positive outcomes for the university included an opportunity to research within the context of a

school, understand and evolve design principles for professional learning, and gain a deeper understanding of teacher stress and potential ways to reduce this.

Discussion and conclusions

In each school, the university and school research partnership responded to the initiatives that the school leadership and teachers identified as important to their present classroom practice. Some initiatives sought to make learning more relevant to students, whether through encouraging students to set their own goals in mathematics and make use of their own performance data or through introducing technology into the literacy class to enable students to work at their own pace in literacy. In the third case, teacher wellbeing was supported by the provision of ongoing support by the researchers to enhance teachers' skills in self-regulation. These case studies responded to the particular challenges and opportunities present in the three different schools, to enhance professional development for teachers through practitioner research (Cramp and Khan 2019).

In all cases the research aimed to respect the knowledge generation of the school teachers through processes in which they took increasing responsibility for evaluating the initiatives they were trialling and evolving in their classrooms. The roles between researchers and teachers differed slightly in each case in response to the various school contexts. The partnerships were not without their challenges which included time and logistical issues identified in previous research by Bartholomew and Sandholtz (2009).

The design-based research methodology (Anderson and Shattuck, 2012) enabled the research team to support teachers to develop their approaches to implementing and iterating curriculum innovations with research informed practice and reflexive evaluation strategies that helped them to produce refinements through further iterations. This 'flipping' of the research partnership to one where researchers support teachers' own initiatives may be

productive for developing successful school-university partnerships that can sustain the benefits of research projects beyond their necessarily limited timeframes. We were interested in understanding the conditions for effective sustainability of the learnings and the evolving of teaching practice, that comes from partnering in research projects. Both schools and universities seek to have long term mutually beneficial research partnerships and effective professional learning. These case studies help to identify a range of potential conditions that establish shared goals in research partnerships that are productive to longer term benefit.

We contend there is not only scope but also a necessity within the prescribed curriculum for teachers to personalise the learning experience for their students, to support both learning and wellbeing outcomes. This project presented a large-scale multi-site study that integrated a focus on the wellbeing and education of regional low SES students in ways that responded to the schools' individual contexts. The interconnected model of teacher professional growth (Clarke and Hollingsworth, 2002) enabled the analysis of three different case studies which each had their own contextually relevant foci for professional experimentation and offered insights into the inputs and outcomes of the changed practices. Evaluative research into how multiple strategies interact, including individual and combined effects on student wellbeing and academic performance has the potential to provide a valuable template to address disadvantage in like contexts, both nationally and internationally. The findings of this study contribute to ongoing dialogues about university and school partnerships as catalysts for teachers' professional experimentation within their classroom practice.

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