# RECLAIMING PROFESSIONAL PRACTICE: CASE STUDIES OF TEACHERS COLLABORATING TO DESIGN LEARNING IN THE SENIOR YEARS OF SCHOOLING

Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

Helen Dolan

College of Arts and Education

Victoria University, Melbourne

August 2019





## ABSTRACT

Despite much policy and research that underscores the need for a greater focus on the professionalism of teachers, including the capacity of teachers to collaborate around curriculum, the historical and contemporary framework of school organisation and practice tends to require individualist approaches to planning and teaching. This study examines the practices of teachers who are collaborating to design interdisciplinary curriculum as part of the South Australian Certificate of Education (SACE). A collective, purposeful case study is constructed to document collaborative planning practices in three key schools and a group of schools taking part in a professional learning STEM strategy to integrate subjects. To appreciate the demands of interdisciplinary planning the study includes the design and facilitation of workshops with Aboriginal women about Indigenous ways of knowing, being and doing, to seek alternative narratives to describe the emerging collaborative design cultures in the case study schools.

Policy and SACE Authority data are interrogated to demonstrate the ways in which teacher collaboration is both encouraged and made relatively invisible. The study argues that the invisibility of collaboration around interdisciplinary approaches to learning needs to be addressed in policy and practices and exemplars made visible to promote wider take-up of interdisciplinary planning practices. Teachers and school leaders in the case study sites point to the ways in which collaborative design work interrupts routine individual practices and replaces them with more collaborative solutions. The study further finds that teachers embrace opportunities to build professional practices through planning learning discourses around curriculum creation processes. The study concludes with the design of a 'Collaborative Design Framework' to support teachers to consider more collaborative ways of planning learning and inclusion of Aboriginal planning standpoints in mainstream education contexts.

# DECLARATION OF AUTHENTICITY

I, Helen Dolan, declare that the PhD thesis, entitled Reclaiming professional practices: case studies about teacher collaboration to design learning in the senior years of schooling, is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

[redacted]

gna ure:

Date: 11th May 2020



# TABLE OF CONTENTS

## TABLES AND FIGURES





## ACKNOWLEDGEMENTS


*To my late mother Margaret ….. because you made it all possible*

*To Jack: ….who loves me*

*To my daughter Leda: ….who inspires me*

*To Aboriginal women and Aboriginal teachers …. who shared their understandings with me and a special thanks to Lisa Warner, facilitator of Aboriginal Women's leadership programs, Jillian Miller, former Superintendent of Aboriginal Education in South Australia and Tammy Edwardson, teacher in secondary schools and in the University sector*

*To my Supervisor Marie Brennan, PhD ….who believed in me*

Extraordinary Professor, Stellenbosch University, South Africa
Honorary Professor of Education, Victoria University, Melbourne
Adjunct Professor, University of South Australia

*To family and women friends…. thank you for your encouragement!*

*and to my grandchildren, Ava and Otto…. I gift this to you*

*And a very special thanks to the schools and inspiring teachers who spend their working lives enriching students' capabilities, especially their capacity to collaborate.*

*Thank you All*

# CHAPTER 1

## DESIGNING STUDENT LEARNING COLLABORATIVELY

### INTRODUCTION

There is a yet to be imagined scope for teachers to learn from other teachers in Australian schools through a focus on practices that nurture professionalism and the creation of collective frameworks of respect and trust. This study seeks clarification from Education Leaders in policy positions, school leadership teams and from classroom teachers about 'professionalism' and the practice of designing learning collaboratively. It also seeks 'other' understandings from Aboriginal women leaders who share key and highly relevant wisdom about collaboration. In this study 'collaborative design' is presented as a way to 'be teacher' and claim, or perhaps reclaim something meaningful about the role of 'teacher' that may have been misplaced, professionally, along the way. This thesis has been enacted over a five-year period and has been subject to design changes to incorporate 'other' knowledge systems to deal with abstract concepts such as 'collaboration' and 'professionalism' which teachers are expected to work with and apply on a daily basis.

Clarity is required because while teacher judgement and capacity to work together is highly valued by members of the profession, education policy often undermines the capacity of teachers to collaborate by framing the work to be accomplished in terms of individual actions. For example, the 'Australian Teacher Standards' (AITSL, 2011) are based on the assumption that teachers will connect with others, to 'plan', 'implement', 'review teaching and learning programs'; 'review, modify and expand repertoire of teaching strategies' and 'lead colleagues in selecting, creating and evaluating resources' (Teacher Standard 3). In the absence of structural and organisational change, however, the onus is placed on the individual teacher to find time and space to collaborate and plan to achieve such outcomes. The Teacher Standards have adopted a 'fixed position on teacher professionalism, where individual teachers largely are 'accountable' for achieving 'a standard'. While teachers engage in performativity objectives, school organisational reforms to support professional collaboration and the collective efforts of teachers are often assumed or such efforts go un-noticed.



Significant curriculum reforms, including the South Australian Certificate of Education (SACE) and the Australian Curriculum (AC) were implemented in the State between 2008 and 2016. The newSACE or future SACE, as it was called during the transition years, made official space for integrated subjects and interdisciplinary work. This study collected data initially during the transition period and then beyond; it is thus able to capture both the previously existing processes developed in some schools and how they were able to use the umbrella of the newSACE policy to create new curriculum approaches collaboratively. The introduction of an Australian national curriculum transitioned to State education authorities during this time. In South Australia, there was a decision to adopt the AC, and the integration of senior secondary Australian Curriculum into SACE subject areas was phased in between 2015-2018 in english, mathematics, sciences, history, and geography subjects.

Senior secondary reforms (2008-2012), including interdisciplinary curriculum design and opportunities for a focus on collaborative thinking and planning, reveal gaps in both practice and policy related to teachers collaborating to design learning. Systemic responsiveness to redress structural and organisational issues to enable interdisciplinary thinking and collaborative planning solutions consequently remain part of a much broader issue about societies commitment to teacher professionalism. Peim warns, that if teachers are not vigilant about their professionalism, including their role as curriculum creators, education may increasingly come to be understood in terms of what Derrida might define as a programmable, delimited, predictable future that is essentially the endless repetition of the present' (2012, p.236). Policy that is indifferent to teacher practice and teacher professionalism risks diminishing teacher belief in their capacity to make a difference.

Despite government policy favouring individualist perceptions about the role of teacher, there are schools and teachers who have found ways to advance teacher professionalism such as through collaborative efforts and influence. These teachers are rejecting individual design practices in favour of collective philosophies with the potential to regenerate and inspire innovative and confident professional teacher identities as creators of curriculum. Teachers in this study therefore are well positioned to contribute to our collective understandings about learning design, including the capacity of teachers to collaborate. They are also in a position to provide insights into the professionalism of teachers based on leadership rather than performativity objectives. They are 'teachers who are choosing to 'jump past the hoops' rather than 'through the hoops' in resisting performativity agendas (Bourke, Lidstone and Ryan, 2013, p.1). This study draws inspiration from such teachers

who are making new spaces to engage with others and with interdisciplinary knowledge to design Integrated Programs of learning. Along the way, teacher understandings about work and professionalism are challenged and existing norms displaced, such that teachers are positioned to consider collaborative rather that individualistic, planning standpoints.

Collaboration, teacher professionalism and interdisciplinarity are the dominant fields of knowledge explored. The identification of contradictions teachers confront on a daily basis also directs the study to consider disciplinary versus interdisciplinary knowledge issues, teacher capacity to interact and collaborate effectively and consideration of 'other' values and knowledge creation systems and practices. Teacher as creator of learning is also a key consideration in a study about reclaiming professional identities.

In the absence of collaborative planning frameworks in school planning generally, this study looks to Aboriginal value systems and knowledge creation practices to identify descriptive narratives about collaboration that align with collaborative design work achieved in some schools. Aboriginal values and knowledge creation practices can inform planning practices and are a way to re-organise and reconceptualise interdisciplinary knowledge when designing learning. Aboriginal ways of 'knowing, being, doing' and valuing provides such a framework. In western knowledge systems, reflection on personal and collective ways of (being, knowing, doing and valuing is a reflection too on our collective and personal ontology, epistemology, methodology and axiology standpoints (Martin and Mirraboopa, 2003, p.209-211).

This work includes researcher reflection about curriculum leadership in schools experiences during the implementation of the Australian curriculum (2012-2016). Therefore references to my role as an Implementation Officer, at the time, in Aboriginal schools are included as are reflections related to longstanding relationships with Aboriginal people prepared to gift knowledge about values and knowledge creation practices. Practices that seemingly align with the details of collaborative design work of some teachers, in schools. Alignment of narratives gifted, with planning practices in schools has developed over time as part of regular 'yarning' with Aboriginal teacher leaders and an Aboriginal Community leader. Chapter eight (Section 7) has been written in consultation with this Community Leader.

The capacity of teachers to 'interact very effectively' (Salonen and Savander-Ranne, 2015, p.8) provides a key focus for this study to explore enablers and barriers of collaborative practice in school contexts.



This study observes that curriculum planning practices in senior secondary contexts continues to be undermined because reforms, systemically, continue to be dominated by assessment rather than planning priorities. As a result, knowledge fields identified and issues and key questions arising are about designing learning and the practice of collaboration in relation to teacher professionalism. Other key issues and questions are about enabling teacher capacity to collaborate, teacher identity as creators of curriculum and a question too about how schools can be organised so teachers can collaborate. With reference to Aboriginal ways of 'knowing, doing, being and valuing' (Martin et al, 2003), the study also asks what a 'collaborative design' framework might look like.

It is important to contextualise the study by offering an insight into the evolution of interdisciplinary thinking and planning in senior schooling in South Australia. This is discussed in the next section and is followed by an overview of the newSACE and the Australian Curriculum and a discussion of key issues in relation to teacher professionalism, as identified in the literature. Issues arising relate to schools not organised around teacher work practices and teacher capacity to collaborate. Additionally, policy and practice stakeholder assumptions about 'collaboration' that contribute to the invisibility of teacher collaboration and interdisciplinary practices are explored. In the absence of data about Integrated Programs and programming that negate teacher efforts to progress an interdisciplinary planning and learning culture is also a key area to be explored through the development of key questions. In Chapter 8, the findings are analysed and discussed in 'sections' and in response to the key issues, and are presented as a contribution for professional discourse at a school or in policy settings.

This introductory chapter presents a pre and post South Australian Certificate of Education (SACE) curriculum renewal perspective (2008-2012) as well as an Australian Curriculum positioning related to interdisciplinary curriculum knowledge, thinking and planning which, despite barriers, has slowly gained momentum as valid alternatives to the plethora of stand-alone SACE subjects. STEM (science, technology, engineering, mathematics) initiatives too have motivated teachers to consider more integrated and collaborative design planning solutions across the range of subjects. The significance of this study is discussed at the end of chapter one and again in the final chapter.

## INTERDISCIPLINARY THINKING AND PLANNING IN SCHOOLS: PRE-NEWSACE

Groundwater-Smith, Brennan, McFadden, Mitchell and Munns (2009) voice scepticism about the level of integration and cross-disciplinary teaching and learning in upper secondary Australian schools. They suggest that 'it would be fair to say that at an upper secondary level the role of integration or cross-disciplinary teaching and learning is at a minimum' (in Long, Moran and Harris, 2010, p.58) and this raises questions about the status of the uptake of integrative practices in secondary schools in Australia, in that

> it is difficult to find many examples of true interdisciplinary study…[ despite] 30 years of experimentation in curriculum linked to interdisciplinarity including a middle schooling focus and generally strong support for more integration across the disciplines and integration with cross curricular approaches for the delivery of ICT, problem- based pedagogies and rich learning tasks.

Fortunately, there are some schools and teachers who persevered in developing interdisciplinary work which helped to give rise to new options for interdisciplinary study in South Australia. It is worth outlining an example of this 'pre-history' here, as an illustration of achievements prior to the reforms to the SACE (2008-2012). For example, in the early 2000s, a small group of teachers at a metropolitan senior secondary public school (Years 10-12) rejected single subject learning options in favour of designing an integrated package of learning for a group of students transitioning back to education after periods of disengagement. (Note that in South Australia, students can only complete their final Certificate in a schooling setting.) A small group of experienced teachers at the school worked deeply with student-centred philosophies to design an Integrated Program that required students to create an individual 'Learning Plan' around which all other learning was connected. 'Learning objects' emerged as part of the integration of subjects and the synthesis of knowledge including English and Information Technology so that each learning object could be linked to each student's individual Learning Plan. From an assessment perspective, however – as remains the situation currently – teachers were required to meet the assessment requirements for each individual subject integrated, so assessment work was repackaged for assessment according to each subject's assessment requirements.

The success of their efforts was the integration of multiple subject content into a 'coherent theory of practice' (Timperley et al., 2007, p..225) and the creation and choice for students of an 'Integrated Program' of learning as part of their SACE. This model proved to be effective for students returning to school after disrupted schooling experiences and informed newSACE options 2008-2012. Connecting content from two or more subjects with a student plan, including student interests and aspirations also helped students visualise successful SACE outcomes and



future pathways. Teachers at the time did extensive mapping of each subject with each stand-alone subject integrated to meet assessment demands and to ensure students were meeting individual subject objectives and were not disadvantaged in any way.

The program created by this small group of teachers with interdisciplinary interests was implemented successfully for as long as the teachers retained their roles. The planning and negotiation of the program was years in the making and teacher efforts were eventually validated a decade later with the inclusion of the 'Cross Disciplinary suite of subjects' as well as the 'Local Program and Integrated Program' option as part of newSACE (2008-2012) reforms. Their advocacy for interdisciplinarity in senior secondary contexts has continued over two decades and one such advocate has been the prime initiator of interdisciplinary learning in senior secondary contexts in a site participating in this study. Research on the prevalence of part-time senior schooling in South Australia by Ramsey and colleagues (Ramsay, 2006; Brennan, Ramsay, McKinnon and Hodgetts, 2009) also provided an impetus for subsequent SACE reforms, recognising the need for flexibility and shifts in school organisation to support student participation. Legislation to increase the school leaving age in 2009 also meant that senior curriculum would need to change to incorporate diversity of students and their future pathways into the year 11 and year 12 curriculum.

## THE SACE REVIEW

The South Australian government instituted a review of its senior secondary certificate, involving three independent reviewers, who reported in 2006. Their Review included a very 'strong call in submissions and consultations for schools to be able to develop learning programs as part of the SACE that result in a curriculum that meets students' individual needs better' and opportunities for teachers 'to develop and have accredited, comprehensive integrated learning units and programs—a facility that was not readily available under existing SACE arrangements' (Crafter, Cook and Reid, 2006, p. 79). The focus was on meeting 'local needs' at every opportunity and to promote a 'SACE for All' culture.

The review recommended 'frameworks organised around an integration of disciplinary knowledge and areas of vocational knowledge. In addition, the learning unit frameworks included a mechanism for interdisciplinary or trans-disciplinary learning (Crafter et al., 2006, p.112). The Review Panel suggested that a model used in Ontario Canada, motivated by changes to teachers working conditions and school routines' (OECD Report, 2012, p.49) within a culture of 'active collaboration and the nurturing of trust' Sahlberg, 2011, p.2), be investigated as a model for constructing interdisciplinary programs. The Ontario model based its work on professional

learning communities as the key driver of improvement that has obvious parallels with collaborative design and teachers designing learning in (learning design) teams.

Recommendation six of the SACE Review advised that the newSACE be based on learning unit frameworks at Stage 1 and Stage 2, and that mechanisms be developed to enable students to undertake 'interdisciplinary study' across frameworks. As a result of these considerations, a 'Cross Disciplinary suite of subjects' and an 'Integrated Program' option were introduced into the SACE in 2008 - 2012 in South Australia.

The SACE Review recommended 'Increased flexibility and responsiveness in all aspects of senior secondary education to attract and hold a more diverse range of students' (Crafter, Crook, and Reid, 2006, p.61). This included a program option where 'schools may develop an Integrated Program that combines the learning and assessment requirements of two or more whole subjects and still enables a student's achievement to be reported with reference to the original subject outlines'. Details for the planning, teaching and assessment of the 'Integrated Program', in contrast to the single subject framework, are presented as a set of SACE Board Guidelines for Local Programs and Integrated Programs (SACE Board Guidelines, reviewed 2018)

The stand-alone 'Integrated Learning' subject, in particular, supports many students to complete SACE requirements. As a result of successful completion rates and teacher and student interest in this subject, the SACE Board in 2014 provided students with the option of completing an additional Stage 2, 'Integrated Learning' stand-alone subject as part of SACE Certificate requirements. The preference of South Australian educators for stand-alone integration options (i.e. a single subject) rather than 'Integrated Program' SACE option approaches can be understood from a historical 'practice architecture' (Kemmis, 2009a) perspective: for example there is an existing individualised planning culture in our schools and policy promoting collaboration to design learning is limited because teachers historically don't plan collaboratively. Consequently, opportunities for teachers to embrace opportunities that mostly involve collaboration with others, is of little consequence and professionalism too continues to be shaped by the familiarity of existing 'practice architectures' (Kemmis 2009a; b). This is discussed in more detail later in Chapter 1, Key Issue one, 'Narrow interpretations of professionalism that undermine a sense of collective teacher identity' (p23-25).

Working as a teacher practitioner from the 1970s to 2000s and later as an Implementation Officer, including for SACE reforms, I used 'Integrated Program' frameworks to support students to complete compulsory SACE subjects including the 'Personal Learning Plan' and Literacy and Numeracy subjects at Stage 1 of the new SACE. By planning and teaching holistic and



integrated programs across subjects at Stage 1 and 2 of the SACE, students appeared more likely to remain engaged. For example, one such program in a farming region integrated all three compulsory subjects at Stage 1 of the SACE using an agriculture focus. Compulsory Literacy, Numeracy and the Personal Learning Plan subject contents were integrated with a focus on agriculture issues providing relevance and meaning for student engagement.

The assessment of 'Integrated Programs' remains contentious. However, the introduction of the subject, the 'Research 'Project', a compulsory SACE subject at Stage 2 of the SACE from the 'Interdisciplinary suite' of subjects, provides a precedent for the assessment of a range of other integrated frameworks such as the 'Integrated Program' that incorporates interdisciplinary skills and understandings and the assessment of more than one subject, concurrently, rather than as separate sets of knowledge and understandings. As noted earlier, interdisciplinary design frameworks have supported students to complete compulsory SACE subjects and to design Integrated Programs of learning by integrating content from across a range of subject frameworks at Stages 1 and 2. These steps help to validate the contribution being achieved by teachers and students engaging with integrated and interdisciplinary SACE frameworks.

The emergence and the visibility of interdisciplinary thinking and learning in the newSACE however continues to be a challenge partly because the 'Integrated Program' option is not complemented by a detailed framework common to other single SACE subjects which is overwhelming to many teachers and schools, new to more integrated design planning approaches. The Integrated Program guidelines also demand that the process of integrating diverse knowledge does not diminish the importance of the learning scope and requirements and the assessment scope and requirements and performance standards of each subject integrated. As a result, all assessment tasks need to be repackaged under disciplinary subject requirements for assessment and reporting purposes. Teachers of Integrated Programs are thus required to revert to 'disciplinary thinking' and single subject disciplinary assessment requirements, after carefully engaging in a complex process to re-conceptualise disciplinary content as interdisciplinary programs of learning. In this way, operational assessment requirements in senior secondary education contexts continue to take precedence over the efforts of teachers to integrate knowledge and organise learning and teaching in schools. Teachers are in consultation with assessment authorities to address such issues but it is the positioning of teachers as implementers of curriculum rather than as creators, which allows such dominant attitudes to teacher work to continue unchallenged.

Nevertheless, interdisciplinary ways of thinking about and designing learning have gained momentum in the SACE. The 'Interdisciplinary suite' of reform provides opportunities for teachers to engage in 'cross-disciplinary' thinking and integrative synthesis processes to design learning from across the range of subject frameworks at Stage 1 and 2 that includes Community Studies, Cross-Disciplinary studies, Integrated Learning, Personal Learning Plan and the Research Project. The introduction of this suite of subjects represents an effort to make integrative practices more visible systemically. It is the first time, for example, that 'integrated' and 'interdisciplinary' terminology has been used to name subject frameworks that are now listed separately but, nevertheless, alongside disciplinary options. The use of more integrated language and the associated imagery suggests that interdisciplinary design practices in senior secondary schools in this state have officially emerged and are possibly here to stay if leadership teams pay attention to the details, including anything preventing a team of teachers from feeling supported to plan collaboratively.

In a senior secondary context, the 'Interdisciplinary suite' and 'Local Programs and Integrated Program Guidelines' send a strong message to schools about the inclusion of opportunities to work with interdisciplinary knowledge as well as disciplinary knowledge. More teachers are aware of the ongoing presence of interdisciplinarity but few senior secondary sites have committed unreservedly to the rigors of interdisciplinary design complexities as deeply as the three key sites identified for this study (Case Study 2, 3 and 4). It is also important to identify a gap in the collection of data about teacher and student capacity to work with interdisciplinary knowledge. Data is not collected about what subjects are integrated and how, nor is there data about Integrated Programs that integrate the compulsory subjects at Stage1 or 2 or data about teacher interest in interdisciplinary planning and learning that is possibly enabling successful SACE outcomes worthy of wider attention. This study, however, provides case study examples that could be used to build better understandings about integration of subject knowledge in the SACE and the work of teachers as designers of SACE curriculum.

**THE INTRODUCTION OF THE AUSTRALIAN CURRICULUM (AC)**

The introduction of a new national Australian Curriculum (AC) has the potential to influence collaboration around integrated curriculum. The development and transition to a new national curriculum, developed federally, commenced in South Australia in 2012 with the implementation of the first learning areas made available to schools for students from Reception to year 10. For senior secondary students ACARA (Australian Curriculum and Reporting Authority have provided



a senior secondary Australian Curriculum in English, Mathematics, Science, Humanities and Social Sciences. In this State authorities have aligned the Australian Curriculum subjects with existing newSACE equivalent subjects, for teaching commencing in 2017-2020.

The newSACE and the evolving Australian senior years curriculum has the potential to further teacher expertise in interdisciplinary practices based on ACARA characterisation of the national curriculum as a 'dynamic and futures-oriented document, subject to 'ongoing monitoring and review' … 'including practice about learning, teaching, curriculum design and implementation; and contemporary research in discipline and cross-discipline areas' (ACARA, 2010, p. 25). I am encouraged by the inclusion of 'curriculum design' and 'cross disciplinary perspectives' in this statement but it is not yet matched by a focus on policy to collaborate professionally as part of core practice. So despite some momentum in interdisciplinary thinking, core organising principles for the Australian Curriculum, as separate subjects, or Key Learning Areas (KLA) remain:

> Disciplinary knowledge, skills and understanding are described across eight learning areas of the Australian Curriculum: English, Mathematics, Science, Health and Physical Education, Humanities and Social Sciences, The Arts, Technologies and Languages. The latter four have been written to include multiple subjects, reflecting custom and practice in the discipline'. (2010, n. p.)

In addition, three Cross-Curriculum Priorities are included to ensure that the 8 KLAs each take up issues and draw connections across the dimensions of the Australian Curriculum on various conceptual themes that 'provide multiple pathways to search, access and organise content to support a progression of learning in relation to a conceptual theme–familiar to teachers who engaged in interdisciplinary planning practices. These are Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia's engagement with Asia and Sustainability.

Specified General Capabilities are meant to be developed in all areas of the curriculum, through diverse KLAs: The Australian Curriculum includes seven General Capabilities: literacy, numeracy, ICT capabilities, critical and creative thinking, personal and social capability, ethical understandings and intercultural understandings. These multiple dimensions in the design of the AC are summarised by ACARA in a figure showing the inter-relationship among the elements:


FIGURE 1: THE THREE DIMENSIONS OF THE AUSTRALIAN CURRICULUM

Thus, there are multiple ways in which the Australian Curriculum (Foundation to Year 10) includes interdisciplinary perspectives. First, it has been written with reference to interdisciplinary complexity of four of the eight disciplinary subject areas listed, namely the Humanities, Social Sciences, the Arts, Technologies and Languages. These learning areas 'reflect custom and practice in the discipline' but also include opportunities for multiple subject perspectives to design learning. Secondly, the Cross-Curriculum Priorities provide opportunities for the inclusion of other knowledges for depth of understanding. 'Curriculum connections' draws connections across the dimensions of the Australian Curriculum on various conceptual themes that 'provide multiple pathways to search, access and organise content to support a progression of learning in relation to a conceptual theme'; very familiar to interdisciplinary planning practice approaches. Thirdly, there is growing interest in the development of new subjects (such as Civics and Citizenship). South Australia's Cross Disciplinary suite of subjects as part of the new South Australian Certificate Education (SACE), includes a range of subject frameworks (Integrated Learning, Multidisciplinary Studies, The Research Project, The Personal Learning Plan, Community Studies and the Integrated Program (the focus of this study), that draw on content from multiple subject frameworks.  Over time, the combination of the newSACE and opportunities that emerge from the AC to build interdisciplinary expertise could add momentum to interdisciplinary thinking, planning and teacher professionalism. Also because many senior secondary teachers work in junior secondary contexts as well, there is opportunity for cross-fertilisation of interdisciplinary thinking and learning from (Years 8-12).



## KEY ISSUES FOR INVESTIGATING TEACHER COLLABORATION RELATED TO THE DESIGN OF INTEGRATED PROGRAMS

The broad issues informing this study are about teacher professionalism and the organisation of schooling to support professional practice. This study broadly supports the view 'the more one educator's learning is shared and supported by others, the more likely that a culture of continuous improvement, collective responsibility and high expectations for students and educators, grows (Killion, 2012, p.17). Greater clarity about professionalism therefore frames the purpose and design for this study that reflects upon research showing 'teachers reporting relatively infrequent collaboration with colleagues within schools (Schleicher, 2012, p.47). Infrequent professional collaboration is not acceptable in a world where there is growing consensus about the need for collective resolutions. Infrequent collaboration is also part of a broader issue about the de-professionalism of teaching, a growing field of knowledge, as researchers seek clarity about a multi-layered concept. This study therefore seeks clarity about professionalism, linked to collaborative practice and in the process, seeks alternative (Aboriginal) narratives about collaboration that may interrupt and inspire different visions to progress teacher thinking about collaboration and professional practices.

This study understands teacher professionalism as the ability of teachers 'to do their work as they see fit on the basis of their own sense of 'knowing' how to do it' (Freidson, 1994, p.73). In other words, teachers require autonomy, individually and collectively to determine the goals associated with work effort. This study is focussed on teachers reclaiming key elements of teacher professionalism by collaborating to design learning. It aims to reveal something of teachers 'truth game' (Foucault, 1972 in Bourke, Lidstone, Ryan, 2013) about professionalism in collaborative design contexts. It is about teacher autonomy and 'teacher will and capacity for self-governance (understood as pedagogical freedom and absence of control) which poses a challenge for teachers, … both individually and collectively' (Mausethagen and Mølstad, 2015, p.39). This study aims to reveal capacity building strategies as a result of teachers designing learning together, that appear to build teacher professional identities. Teachers require collective identity resolutions to draw strength from one another's ideas and shared experiences and, as observed in Aboriginal frameworks (NHMRC, 2003), and in key Aboriginal values of respect, reciprocity and responsibility for 'survival and protection'. a focus on the development of a collective identity, could be a key consideration in any future position on teacher professionalism. Engaging in discourse about values, knowledge and collaboration helps free pedagogical thinking and provides opportunities to build teacher capacity to contest the de-professionalisation of the teaching profession

**Key Issue 1: Narrow interpretations of teacher professionalism**

Because professionalism continues to be shaped by the familiarity of existing 'practice architectures' (Kemmis, 2009a) of the profession, and professionalism means different things to suit diverse purposes and contexts, it is defined broadly in the literature. Schools require starting points from which they can build their own professionalism frameworks to guide professional development and professional practice. The OECD Professional Teacher Index (Schleicher, 2016, p.36-37), for example, talks about professionalism from the perspective of domains that include teacher knowledge, teacher autonomy and teacher capacity to connect and collaborate. This study has chosen to work with Schleicher's domains of professionalism (Figure 2: OECD Professional Teacher Index, 2016) to help clarify and simplify the plethora of understandings associated with teacher professionalism in the literature. See Figure 2 below.

| |
|---|
| **Domain 1: 'Teacher Knowledge**: Knowledge necessary for teaching. Includes formal teacher education and incentives for professional development (OECD, 2014b) Includes regular information exchange, to reach consensus about teacher practice including planning learning and collaborating to moderate to maintain standards. Provides opportunities for teachers to challenge 'practice architectures'; teacher sayings, doings and relatings about practice. |
| **Domain 2:** '**Teacher (collective) Autonomy':** Collective responsibility for decision making related to teacher work (OECD, 2014b) including teaching content, course offerings, employment of staff specific to the needs of a learning design team of teachers. |
| **Domain 3: 'Teacher capacity to collaborate with peer networks** (OECD, 2014b). Includes 'capacity building' which is 'any strategy that increases the collective effectiveness of a group,' (Levin & Fullan, 2008, p295) Includes leadership team responsiveness to anything preventing or enabling collaborative teacher practice. |

**FIGURE 2:** OECD PROFESSIONAL TEACHER INDEX (Schleicher, 2016, p.36)

In the process of researching 'collaborative design' this study is encouraged to consider 'collaborative design and what this practice contributes to discourses of professionalism. From the perspective of the baby boomer generation who were often the first members in a family of the 1960s and 1970s to hope for a tertiary education, professionalism was an aspirational ideal worth pursuing. They were the days of professionalism 'as an exclusive club' (Evans, 2015, p3)



to which teachers were encouraged to aspire. In more recent, critical observations in the literature, Johnston (2015) for example found that professionalism in Australian schools is largely associated with the expectation of improved standards of teaching and includes, for example, the implementation of the 2011 Australian Teacher Standards (AITSL, 2011), (2015, p3). The Standards state; 'standards contribute to the professionalisation of teaching and raise the status of the profession' (Australian Institute for Teaching and School Leadership (AITSL, 2011 p.1). Johnston contests this and argues:

> while providing some clarity about what being professional may be, it could be argued that the implementation of a set of professional standards for teachers also narrows the perception and appearance of professionality' (2015, p6).

Professionalism discourses, when used as a way to standardise individual teacher practice as well as develop individualised policy and attitudes about teacher work, have encroached on what teachers already do: which is, 'to interact very effectively' (Salonen et al 2015). Interpretations of professionalism that narrow professionality can undermine a sense of collective teacher identity and teacher belief in their capacity to make a difference, or 'collective efficacy' as defined by Bandura (1997, p.477).

Researchers, post 2011, understand professionalism in more ambiguous terms, which this study suggests reflects the lived experience of 'professionalism' for many teachers. Ambiguity about professionalism reflects a system that has most likely not prioritised opportunities for teachers to share, collaborate, create or purposefully engage in routine professional discourses as part of teacher work. Such opportunities are critical to avoid compliant attitudes and narrow interpretations of professionalism as promoted by the 'Standards' that erode teacher voice and suppress the breadth and depth of teacher expertise often invisible and lying dormant in school communities.

The design of this study therefore needs to seek alternative professionalism narratives, such as narratives about 'teacher capacity to collaborate' (Salonen et al, 2015) or narratives about teacher expertise to engage students, design learning or assess learning. Narratives about teacher excellence remain invisible in schools, while in comparison official 'teacher improvement' narratives related to 'Teacher Standards' means that this conceptualisation of professionalism continues to thrive. Challenging 'teacher improvement' cultures and associated narratives and promoting teacher expertise narratives collectively is an important step in reclaiming 'professionalism' on teacher terms. I am aware that schools, including the case study schools for this study, which embrace 'collaborative design' practices, are perhaps more likely to develop their own conceptualisations of professionalism.

Groundwater-Smith and Mockler identify inquiry-based professional learning as both an enabler and mobiliser of professional judgment and professional courage (2009, p136). This study, likewise, suggests 'collaborative design' which 'offers a counter strategy' to a teacher improvement professionalism focus and also provides positive teacher expertise narratives that challenge teacher compliance. Gilbert too, discusses on-going collaboration as an important aspect of building professional learning communities, capacitating teacher organisation and leadership and keeping teachers engaged with school environments. He also advises that additional curriculum reform expectations require on-going professional learning as an essential component of successful curriculum change (2012, p44).

In these more recent times, researchers have moved towards professionalism "*as including work-related learning or development that occurs unconsciously, without people's awareness of being developed* (Evans, 2015, p9). 'Collaborative design' is an opportunity to explore and contribute to teacher 'development that occurs unconsciously'. Evans describes it as research that attempts to understand *'what goes on in an individual's head that makes her or him accept a new idea or new way of doing something, that represents a professional development '*episode'. In this study, it is referred to as an epistemological shift or a change in practice from individual to more collaborative ways of being a teacher (Andreotti, 2012). The case studies provide examples of teacher claims about 'professional development episodes' and teacher acceptance of new ideas. Metaphors and teacher explanations of metaphors that describe collaborative design practice also provide insights into teacher acceptance of '*new ways of doing something'.* See chapter 8, section 6 and 8).

Evans also observes that inadequate definitions and conceptualisations of professionalism and professional development abound and far too few researchers clarify what they mean when they use these terms (2015, p10). The prevalence of inadequate definitions is why this study has chosen to refer primarily to Schleicher's OECD teacher professionalism domains, (knowledge acquisition, working with autonomy and networking) because they at least provide clarity and offer the researcher opportunities to construct consistent methodological lines of inquiry.

Teacher claims about professionalism in relation to designing learning collaboratively will be discussed in each of the case studies using Bourke et al, six definitions of professionalism about how teachers enact their roles, in collaborative design contexts. Analysis and discussion therefore will reflect on teacher professionalism claims in relation to aspirational, assertive, overt, subtle, passive, or unresisting, resistance standpoints (Bourke et al, 2013, p.5). Because the study is about teacher leadership more generally, personal observations suggest, the more overt forms of teacher resistance to performativity management regimes, will be more relevant.



Evans observes that professionalism is very much a contested concept and many researchers argue for the 'need to work with 'plural conceptions' of professionalism. In the literature a range of views represent professionalism variously as a form of

> occupational control; a socially constructed and dynamic entity; a mode of social co-ordination; the application of knowledge to specific cases; the use of knowledge as social capital; a normative values system that incorporates consideration of standards, ethics, and quality of service; the basis of the relationship between professionals and their clients or publics; a source of specific identity; and a basis and determinant of social and professional status and power (2015, p3).

Because teachers are more likely to develop professional identities or change professional practices in 'work related learning situations' 'where teachers are unaware of being developed' (Evans, 2015, p9), Evans suggests that a study about 'collaborative design practice' can contribute to our understandings about teacher 'development that occurs unconsciously'. This is because work-related learning situations are most likely collaborative and include engaging in discourse, creating with others, and designing learning together, situations that are about teacher development (professional learning, professional practice) that relates to teacher knowledge, teacher autonomy and teacher networking (OECD Professional Teacher Index, 2016). This study suggests professionalism therefore, can also be conceptualised usefully mainly in terms of 'teacher practices' including teacher belief in their collective capacity to make a difference referred to by Bandura as 'collective efficacy' (1997, p. 477). In terms of school leadership too, Donohoo, Hattie and Eells suggest promoting a culture of collaboration focused on

> knowing thy collective impact, leaders have the potential to support school improvement in ways that positively influence teachers' collective efficacy beliefs and thus promote student achievement (2018, p43)

**Key Issue 2: Schooling is not organised around teacher work practices or teacher capacity to collaborate**

Educators are part of a work culture, which appears resigned to the fact that a teacher will carry on individually, regardless of the collective challenges presented. Building upon the core capacity of teachers to collaborate (Salonen et al. 2015, p.8), as observed in design contexts in the case study sites, is an obvious consideration, moving forward. There is, however, little time for teacher planning, let alone collaborative design or shared implementation despite the identified need for intense collaboration to sustain and improve teacher practice and educational outcomes for

students. The outcome for teachers therefore is that they continue to act individually rather than collectively despite research and scholarship continually noting collaboration as an issue needing addressing, as reflected in the following quotes:

> Teachers report relatively infrequent collaboration with colleagues within schools, beyond a mere exchange of information and ideas (Schleicher, 2012, p. 47).
>
> School Principals report that a lack of preparation is a serious problem in Australian schools (Grattan Institute, 2010, np)
>
> Teachers identify the need for 'more meaningful professional collaboration between teachers in schools' (Jenson, 2010, p.20)
>
> Learning about planning and being able to plan effectively is identified by newly qualified teachers as an area requiring significant focus (Hagger, Mutton, Burn, 2011, p.394).
>
> More than half of new teachers in most countries never received appraisal or feedback from an external individual (Schleicher, 2012, p.71)
>
> Three out of four teachers responding to the OECD Teaching and Learning International Survey (TALIS) in 2008 reported that they would not be rewarded for being more innovative in their teaching (Schleicher, 2012, p.36).
>
> Across OECD countries, more than half of 15-year-olds are in schools where school-level stakeholders have the responsibility to decide which courses are offered, and more than 40% of students are in schools that determine course content. School leaders generally have a degree of discretion in how they design curriculum content and sequencing, organize teaching and instructional resources, and monitor quality (Schleicher, 2012, p.19)

Policy related to collaboration in schooling is often determined by 'the rhetoric of grand challenges' (Benneworth, Amanatidou, Schachter and Gulbrandsen, 2014, p.3), including most recently a focus on collaborative planning across STEM subjects which is challenging teachers to plan together and engage in conversations about the practice of teaching and learning itself.

> Unfortunately, collaboration is 'intimately bound up with the rhetoric of grand challenges' such as multiculturalism, reconciliation, technological and environmental challenges that teachers understand as central to their role. Teachers collectively and individually often 'carry the burden of delivering' these big-ticket policy items without support or negotiation related to the various domains of teacher professionalism (Benneworth, et al, 2014, p.3).

Despite the discretion of leadership teams in schools about how curriculum is designed, the responsibility for designing learning is ultimately realised by the individual teacher often with limited support or follow-up, as quoted, and for many teachers, especially early career teachers, this can be particularly overwhelming. So, despite data suggesting that 40% of site leaders across OECD countries have discretionary powers to change how curriculum is designed, including from individual to more collective resolutions, leadership teams are perhaps not using or do not have discretionary powers to promote greater teacher curriculum design collaboration.



Teachers will continue to design learning individually because it is part of teachers' practice architecture[1], their perceptions, understandings about 'right conduct', 'praxis' in education contexts, and specific to each subject, all of which 'enable and constrain conduct in three dimensions: 'sayings', 'doings', and 'relatings' (Kemmis, 2009a). In this study I am interested in the 'sayings' linked to rhetoric associated with teachers being collaborative and the 'doings' and 'relatings' linked to teachers designing learning collectively rather than individually. The individualised 'praxis' associated with designing learning traditionally has constrained curriculum design practices and responsibilities to the individual teacher rather than allowing it to take on more collective perspective. Green suggests changing practice architectures, that often place teachers in impossible and unsustainable conditions, 'requires forms of collective change and forms of collaborative discussion and inquiry to explore not just changing what practitioners know and think and say and do but how teachers relate to others' (2009, p.37).

Kelchtermans argues too that

> the value that is placed on shared work must be both said and shown. The opportunity for shared work and shared study must be prominent in the schedule for the day, the week, the year. The purpose for working together must be compelling and the task sufficiently challenging. The material resources and human assistance must be adequate. The accomplishments of individuals and groups must be recognized (2006, p. 224).

This statement highlights the complexity of collaborative interventions and demands that teachers collaborate routinely. The research design needs to select methods that help to reveal the multiple and subtle forces that impact on collaborative success or failure in schools and identifies the forces that help to unravel the complexities of collaborative practices that are all so easily ignored.

**Key Issue 3: Lack of clarity about 'collaboration' exploits teacher capacity to collaborate**

Limited conceptual clarity about collaborative practices adds to the complexity of teacher work and 'without more specificity, more models ... more evaluation, understanding and development and practice of collective ideologies, collaborative narratives have become part of a common vocabulary, but influences practice little' (Brown, 1994, p.8). The research identifies the significance of a 'shared collective responsibility for outcomes' (Killion, 2012, p. 2) where the 'focus shifts from a focus on individual goals to teachers contributing to the learning and knowledge base of all teachers (Cole, 2012, p.2).

---

[1] Kemmis (2009a) notes 'practice architectures' …are constructed not only by the knowledge, capabilities, values internal to traditions in education but also by meta-practices external to those traditions –meta-practices of educational administration, policy making, …teacher education, and educational research and evaluation. See Chapter 2.

Collaboration is an evolving process and expectations of collaborative practices and of teachers, is largely implicit. Additionally, collaborative behaviours about knowing, thinking and doing (Martin et al 2003) collectively, are mostly undefined in our schools. So, even though there is consensus about the importance of collaboration, the 'professionalism of teachers' and the importance of 'collective excellence' (Hattie, 2015, p27), and 'collective teacher efficacy' (Bandura, 1997, Eells, 2011, Donohoo 2017, Donohoo, Hattie, Eells, 2018), the various areas of teacher professionalism continue to lack definition and clarity and receive random attention, at best. The ambiguous articulation of teacher professionalism remains because teachers are not positioned to 'collaborate' as part of routine teacher practices. Without such a focus rhetoric and inaction conspire to make teacher professionalism invisible and the responsibility for teacher professionalism remains no one's in particular.

Long suggests that 'true interdisciplinarity re-conceptualises the role of teacher and learner' (2010, p.48) and in doing so helps to maximize opportunities for teachers to collaborate and co-create learning opportunities with colleagues and with students. This study agrees with Long and observes that Integrated Program design work, challenges the role of teacher as implementer because when teachers collaborate to design learning they are required to engage in synthesis of knowledge, share knowledge, negotiate and reach consensus on all aspects of the design process. Collaborative design is 'the glue' that supports teacher creativity and innovative potential (Davis, Aruldoss, McNair and Bizas, 2013b, p189). This statement embodies the collaborative design work observed of the case study sites.

There have certainly been various movements to build teacher capacity to collaborate, including philosophical efforts towards an appreciation of more constructivist viewpoints about teachers making meaning of teaching practice with others. There has also been efforts to change the architecture of schools with a focus on changes to physical surroundings and SACE curriculum reforms, and the introduction of a Cross Disciplinary suite of subjects have all made contributions to collaborative practice for teachers and students. These changes progress the possibility for collaborative, cross disciplinary curriculum design work but collaboration requires not only teacher commitment but system wide action to support teacher knowledge, autonomy and teacher capacity to collaborate.

To achieve 'knowing'; 'knowledge about knowledge, or awareness of the processes of learning and knowing, rather than the content of what is known' (Meta Knowledge), (Yunkaporta, 2009, p.11), requires opportunities to engage across the various professionalism domains and opportunities to seek diverse knowledge and knowledge creation practices and understandings,



including knowledge about 'shared collective responsibility' (Killion, 2012). Such concepts, have links, to 'Aboriginal Ancestral Knowingness; knowledge as a changing force that flows from land, spirit and Ancestors and is constantly evolving' (Yunkaporta, 2009, p.11). Understanding other knowledge creation possibilities will be reflected upon in the stories provided by teachers in this study.

Given the research evidence, teacher capacity to network and collaborate needs to be recognised as part of core teacher work and included in education policy contexts. As a way of being and doing teacher work collaboration needs to be visible and preserved in everything that teachers do, but it somehow remains a secondary consideration instead of being practised as a critical and visible component of what teachers do on a routine basis. Questions need to be asked about how a system can persist with collaborative rhetoric in the absence of policy that supports teacher capacity to collaborate. It is incongruous and often places teachers in unsustainable situations.

Changing how teachers plan learning to include integrative synthesis across subjects and shared design practices is in reach of all teachers. Unfortunately, 'teacher capacity to interact very effectively' as identified by Salonen et al as a 'core teacher capacity', remains largely ignored or blatantly exploited without policy acknowledgement.

Knowledge, skills, access to resources and time required for teachers to 'craft' learning within assessment and accountability frameworks, while also designing learning inclusive of individual student needs is increasing the complexity of the design process. Despite the added complexities it is a responsibility that the individual teacher often welcomes because, I believe, teachers understand the design process as an intellectual and creative challenge that they take enormous pride in crafting and are instinctively compelled to combine their knowledge, skill, commitment and judgment 'to do a job well for its own sake' (Sennett, 2012, Utube). Teachers who understand the design process in this way need to be able to engage in curriculum design discourses in spaces where both their tacit and explicit knowledge is respected, shared, challenged, negotiated and eventually understood, collectively. Such spaces include interdisciplinary thinking and design spaces, where the design of learning revolves around teacher capacity to embrace a co-creation principle that involves not just thinking about what to design but designing in order to think and tapping into capacities that are often overlooked by conventional planning learning practices (Leavy, 2012, p28).

To support the visibility of teacher professionalism too, consideration of 'teacher as craftsman/woman' may be useful. 'Craftsmanship' concepts provide understandings about the

design skills and dispositions teachers require to design learning. The experiences and practices of teachers collaborating to design learning reflect Sennett's understandings about 'craftsmanship' and the deep connection many teachers experience when provided with opportunities and enabling conditions to engage in designing learning and then subsequently being positioned to teach that learning.

Sennett talks about the 'enduring, basic human impulse that combines skill, commitment and judgment to establish a close relationship between head and hand' (2012, Utube). Sennett asserts that this connection is vital to physical, mental and societal well-being. The deep head-hand connection experienced by many teachers perhaps represents the desire teachers have for a broader interpretation of teacher professionalism to include teacher as creator of learning. This desire and subsequent struggle to achieve this connection has been brought to my attention particularly in interdisciplinary design schooling contexts. The 'head', 'hand' objective and recognition of teacher as creator, I believe, deserves greater consideration in research and in practice and policy contexts.

Sennett's 'craftsmanship' perspective is also worthy of our attention about doing a job well for its own sake and includes seeing a job through from the design phase to the implementation phase to make an educational difference. This sense of making an educational difference aligns with Eells' meta-analysis of teachers designing learning collectively to make an difference to students' lives (2011).

The Australian Institute for Teaching and Student Learning (AITSL) has the responsibility for development of 'The Professional Learning Charter' and the 'Leadership Development Framework' in Australian schools. These documents eagerly describe the culture and processes for effective collaboration and professional growth in predominantly individual teacher behavioural terms and fail to describe any associated structural or organisational requirements so teachers can collaborate to 'make a collective difference' in the first place.

The 'Australian Professional Standards for Teachers[2] is fundamentally about individual teacher accountability and what the individual teacher should or could do to attain 'proficient', 'highly

[2] The Australian teaching Standards is "part of Australia's efforts to improve student attainment and ensure it has a world class system of education. Their development included a synthesis of the descriptions of teachers' knowledge, practice and professional engagement used by teacher accreditation and registration authorities, employers and professional associations. Each descriptor has been informed by teachers' understanding of what is required at different stages of their careers. An extensive validation process involving almost 6,000 teachers ensured that each descriptor was shaped by the profession"



accomplished' or 'lead ratings'. An individualised perspective is contradictory to the very concept of collaboration or 'collective teacher efficacy' or 'passion for making the difference' (Hattie, 2015, p. 27). Concepts embraced by many teachers but with limited systemic awareness about the struggle to connect routinely in an eight-hour+ day.

The Teacher Standards boldly promote teacher capacity to

> lead colleagues, work with colleagues, initiate collaborative relationships, initiate strategies, lead and implement, demonstrate and lead, model and support colleagues, model exemplary practice and initiate programs, implement professional dialogue within the school or professional learning network(s), advocate, participate in and lead strategies to support high-quality professional learning opportunities for colleagues (AITSL, n.d.).

To achieve this level of connectedness, the organisation of schooling, structural change and teacher work conditions need to be part of any deliberations about 'collaboration inspired' resolutions.

'The Australian guidelines for school leadership development' has a focus on the identification of future leaders rather than 'teacher leaders' or 'teachers as leaders'. I suggest a focus on 'the capacity to make a collective difference' be considered in any leadership identification process. The limited conceptual clarity about 'collaboration' in policy and practice generally, and the associated collaboration rhetoric for teachers to be increasingly collaborative has become part of a shared language in schooling that relentlessly demands collaborative resolutions but without reference to changes to the organisation of schooling or teacher work and conditions.

In light of Eells' findings about the significance of teacher belief that they can make a collective educational difference (2011, p121) it is more critical than ever to revise our perceptions about teacher work not being collective, and identify and address aspects of schooling that are constraining professional collaboration and the capacity of teachers to collaborate and replace them with actions that enable teachers to make a difference.

Insufficient consideration in support of teacher professionalism is evident across schooling; however, I believe that the schools taking part in this study are genuinely interested in developing a culture of commitment to 'teacher professionalism' and collective efficacy and are routinely

(Australian Institute of Teaching and School Leadership) (AITSL) https://www.aitsl.edu.au/docs/default-source/apst-resources/australian_professional_standard_for_teachers_final.pdf

addressing this through a focus on capacity-building strategies including ‘sharing’ knowledge to design ‘Integrated Programs’ of learning introduced as part of SACE reforms for the South Australian Certificate of Education (SACE), (2008-2012). This includes adopting and adapting interdisciplinary design approaches in teams that encourage teachers to share expertise and collaborate depending on what subjects are being integrated. These actions are being implemented in teams that are largely autonomous and have significant school leadership responsibilities. Sharing knowledge gathers momentum and, as a consequence, teachers in these sites appear to be developing the capacity to collaborate with peer networks, routinely. They are therefore developing collaborative philosophies which perhaps better reflect the ways students see and understand a more connected world.

> At the collective level, the beliefs that teachers hold about their school’s ability to affect achievement are important to the success of that school. Intervention efforts can be directed at building efficacy, so that teachers approach their schools ready, willing, and able to be effective (Eells, 2011, p129)

Across the education spectrum there is insufficient consideration in support of teacher leadership and professionalism and when teachers do get together, to craft ‘Integrated Programs’ for example, professional outcomes are generally poorly understood, except by the teachers engaged in the process. Unfortunately limited awareness about the collaborative design process and for teacher as leader and creator of curriculum is generally assumed rather than understood. Many teachers do seek active decision-making roles and this is reflected in the case study sites through persistent teacher efforts to work in interdisciplinary and collaborative ways, despite philosophical, attitudinal and structural and organisational barriers.

If teachers are to work more consistently as high-level knowledge workers, policy that encourages recognition of the early adaptors of education innovation such as those developing Integrated Programs would further support their efforts. Champions of the ‘Integrated Program’ option in senior secondary are persistent in their efforts to collaborate, identify, adapt, adopt, re-interpret, reimagine and reconstruct curriculum knowledge. It is the ‘teacher lead-user’ or teaching team that is innovating and advancing knowledge associated with curriculum reform in interdisciplinary design contexts, and not the State mandated authority, which is merely the messenger, the observer of reforms. The reforms themselves are as a result of teachers sharing expertise at the local level. The original curriculum artefact provided to teachers needs to be understood at a policy and implementation level as merely a guide to what evolves in curriculum



at the local level if teachers are to ever achieve a satisfactory level of collective and creative autonomy where they can assume teacher as creator of knowledge status. Reforms associated with ‘knowledge building’ are best achieved through sharing expertise on a regular basis, which in the case study sites includes the practice of sharing interdisciplinary understandings and expertise and designing ‘Integrated Programs’ collectively.

**Key issue 4: The invisibility of interdisciplinary planning options in a disciplinary world**

In a disciplinary world, which is familiar to most, a school, for example, offers the subject ‘Biology’ and individual teachers take their cues for designing a program of learning from the SACE Biology subject framework provided by this States Reporting Authority for the senior secondary Certificate of Education as well as from Biology exemplars on the SACE Board website. In contrast, in an interdisciplinary context, teachers intentionally collaborate to design learning and the inclusion of biological knowledge becomes one aspect of a much broader topic of learning. In one of the schools participating in this study, for example, biological knowledge was integrated into a program called ‘The Body in Question’ and included a collective re-imagination and reconstruction of physics, physiology, psychology, immunology, mathematics, language and literacy knowledges. The key difference is not only about teachers working collectively to design learning; it is also about creating something collectively and respect for other teachers’ knowledge and design.

Unquestioning acceptance of entrenched disciplinary standpoints is to the detriment of interdisciplinary knowledge, thinking and understanding in senior schooling, which, as a way of understanding learning, is increasingly relevant. The initial intent of the ‘Interdisciplinary suite’ of SACE subjects introduced in 2008-2012 in this state was about the growing importance of interdisciplinary knowledge. It was not about the importance of teacher professionalism or teachers sharing expertise. The package does not come with a preferential collaborative design approach label. The subjects in the suite can all be designed individually without reference or regard to teacher capacity to collaborate. The subject names themselves are suggestive of the need to seek knowledge and expertise elsewhere but, from my experience as a Project Officer for the implementation of SACE curriculum, teachers continue to design these subjects individually because that is what they have always done, so these options have had limited impact on actual teacher design practice and the capacity of teachers to network and collaborate which perhaps should be the intent of any interdisciplinary reform agenda.

Schleicher agrees and notes that ‘too many policies have focused on individual teachers and school leaders instead of trying to change how teachers work. Ontario’s relatively recent education reform agenda, ‘where improvement was based on a change in teachers’ working conditions and school routines’, may be a more useful agenda (OECD, 2013, p.49). This study supports such an approach.

One of the key reasons I have chosen to research teachers collaborating to design ‘Integrated Programs’ is because this option offers a design process where teachers have greater control over the process rather than designing learning based on an individual teacher response to subject content and assessment scope and sequence provided by state assessment authorities. The ‘Integrated Program’ option encourages teachers to build relationships with colleagues from across the disciplines and allows for a re-imagination of content across two or more subjects, to address key ideas and issues of interest to students. Importantly the design process builds teacher capacity to collaborate as well as teacher expertise as knowledge builders. The process has the potential to directly impact on teacher practice and influence in schooling and positions teachers as creators as well as implementers of curriculum. Schleicher describes such teachers as ‘high-level knowledge workers who constantly advance their own professional knowledge as well as that of their profession’ (2012, p.38) and suggests we need as many of these sorts of teachers as possible.

**Key issue 5: Limited availability of data to inform generations of teachers about ‘Integrated Programs’ and programming practices**

Lack of publicly available data results in limited emergence of the Integrated Program option in senior schooling and this is a major issue for its continuing emergence across sites. ‘Systemic emergence’ is the diffusion of systems level interventions, more widely and is referred to in literature about ‘Learning Frontiers’ (2013, p.2) of relevance to Key Case Study 3, Chapter 5.

The application of interdisciplinary design resolutions as a practice has been validated strongly as a way to facilitate and engage teachers in the design of STEM (Science, Technology, Engineering, Mathematics) initiatives internationally and nationally (see Chapter 7. ‘A Case study of teachers’ designing integrated ‘STEM’ programs collaboratively’). Teachers in the participating schools have created senior secondary Integrated Programs of learning with names that champion their interdisciplinarity such as an Integrated Program called ‘Dream, design and develop’, a central study that has as its focus the innovation cycle that requires students to identify a problem and then engage in a process to design, prototype and market a solution. There is also a program called ‘Order from Chaos’, a central study with a focus on humanity



seeking and creating order in the form of systems and patterns and examines both order and chaos within human society and the natural world.

Despite the sophistication and relevance of the Integrated Programs created, existing assessment policy and limited Integrated Program data collection, to inform teachers about Integrated Programs and practices, contributes to the limited emergence and visibility of the ‘Integrated Program’ option in senior schooling in this state. These programs are not as visible to other teachers because they cannot be named or assessed as ‘Integrated Programs’ because student work is required to be assessed as part of individual subjects. Interdisciplinary thinking and understandings also do not align neatly with single discipline-based content and assessment scope and requirements, and this unfortunately is to the detriment of the emergence of interdisciplinary thinking and ‘knowing’ and teachers working collectively with interdisciplinary curriculum knowledge and design options. I suggest if the Integrated Program option was more accessible and visible in the data this learning option would ultimately enable teacher professionalism to be more broadly actioned.

However, given the current invisibility of the Integrated Program option there is limited opportunity for the practice to emerge as a viable design alternative to disciplinary subject options in senior secondary contexts. Its emergence is dependent on providing evidence to the contrary. The invisibility of the Integrated Program option is compounded because data about student participation and completion at Stage 1 or 2 of the SACE, which is a given for all other SACE subjects, is not available for Integrated Programs. Official student SACE outcomes do not include data about student engagement in ‘Integrated Programs ‘and student results are based on the ‘assessment scope and requirements’ of each subject integrated and requires, as discussed earlier, that teachers re-package assessment tasks specific to single subject requirements, for assessment purposes. This practice, although ‘managed’ professionally by teachers, undermines the significance of interdisciplinary thinking and learning. It also undermines interdisciplinary expertise of teachers and their capacity to engage deeply with diverse knowledges to design innovative learning opportunities for groups of students. It is an example of the ‘”grammars” of schooling, (about designing learning and knowledge) being encoded deeply in social-institutional frames (over time) that function to reproduce power inequalities’ (Brennan and Zipin, 2018, p.246).

Because data is not collected about interdisciplinary programs and practices ‘grammar of schooling’ perceptions persist and determine how teachers design learning and what forms of knowledge should be included or excluded. I agree with Roger Martin of Ontario reform

significance when he describes the need for all of us to adopt a worldview that says that ‘any existing models are not reality’. Adopting a standpoint that embraces integrative thinking visions and includes collecting data about Integrated Programs can help expand integrated and collaborative possibilities rather than shrinking the possibilities (Martin, 2013/14, p.3, p.7) for systemic emergence.

The positioning of the ‘Integrated Program’ option on our State Government’s Assessment Authority website is also unconvincing in terms of its visibility and accessibility especially for early career teachers. Firstly, the Integrated Program option is not part of the SACE ‘Interdisciplinary suite’ of options because it cannot be defined as a single subject and it cannot be found as part of a mainstream search for teachers keen to access information about ‘Integrated Programs’. The information that is available is in the form of a five-page document ‘Guidelines for the development of Local Programs and Integrated Programs’ SACE Board, n. p), from the SACE Board of South Australia and is informative but does not identify teacher capacity and conditions required nor the complexity of the design process to create such programs. This responsibility lies within the jurisdiction of the various schooling sectors in this state including the Government, Independent and Catholic school sectors.

The SACE Boards website, however, has agreed to teachers accessing two Integrated Programs online that enable students to complete these programs as part of the SACE. The Integrated Programs are called ‘Preparation for work or TAFE study’ and ‘Preparation for University entry’. These programs were created in one of the schools in this study; however they are presented as a list of single subjects without details of the integration of knowledge or how teachers can connect and collaborate in interdisciplinary thinking spaces to design such programs. Interdisciplinary expertise is of little consequence from a policy and assessment perspective and is the domain of schools and teachers to interpret, negotiate, construct and reconstruct on behalf of their communities.

**Key Issue 6: The absence of alternative thinking and planning in curriculum planning contexts**

The absence of alternative thinking and planning in curriculum planning contexts limits opportunities for consideration of diverse planning perspectives. This study includes reference to Aboriginal knowledge creation and planning processes that may help guide curriculum planning decisions in schools. Descriptions of and the use of Aboriginal narratives about ‘knowledge creation’ processes may contribute to decisions about what may work best with a diversity of students and includes consideration for example, of ‘holistic’, deep narrative’, ‘communal



knowledge’, ‘Elder knowingness’, ‘Intellectual Biomimicry’, ‘circular logic’, ‘synergistic knowledge’, ‘Indigenous pluralism; narratives that may influence teacher (Yunkaporta, 2007,n.p.) thinking and planning practices.

Facilitating teacher awareness of alternative thinking, planning and knowledge building practices, as part of collaborative design contexts supports teachers to design and apply knowledge in unfamiliar ways. For example, thinking about and applying curriculum knowledge ‘as a changing force that flows and is constantly evolving’; that ‘is inseparable from land, place, spirit, language, kin, law, story’; ‘that is inseparable from deep narratives’; ‘that draws upon nature based concepts for deeper understanding of abstract concepts’; ‘that draws knowledge from many language groups’ and asks teachers and students ‘to return to concepts for deeper understanding’ and ‘cyclic views of time and processes’ and knowledge creation practices that recognise that, ‘knowledge is developed, retained and shared for innovative thinking’. Yunkaporta explains ‘learning doesn't go straight from one side to the other, It bends out to the side, bringing in knowledge that might seem to be off topic, but that creates deeper understandings (2009, p.7). Similarly in relation to drivers of interdisciplinary learning, Klaassen defers to Mazur who refers to iterative loops in learning that ‘allows for the integration of diverse disciplinary knowledge bases to resolve a problem (Klaassen, 2018, p.2).

Knowledge creation understandings and insights provide a space for teachers to think about designing learning from alternative perspectives and connects teachers with alternative knowledge creation perspectives and ideas for pedagogical and curriculum resolutions. Some of these ways of thinking about and designing learning have been identified in the case studies and I believe reflect the thinking and actions of teachers in interdisciplinary design contexts. This study promotes the application of Aboriginal knowledge creation practices as a possible framework for how teachers can plan and design learning, particularly in interdisciplinary contexts and in mainstream planning contexts as well.

Acknowledgement of Aboriginal planning practices in interdisciplinary design contexts represents a way forward to reclaim Aboriginal ‘knowledge creation’ and planning practices more generally. ‘Reclaiming Indigenous planning includes: connecting the past and the present to facilitate Indigenous planning for the future’ and ‘rethinking planning practices that include traditional knowledge, cultural identity and control and care over land and resources’ (Walker, Jojola and Natcher, 2013, p.1). These authors may be talking here specifically about planning for sustainability of culture and resources but their statement could just as easily apply in education

'planning' contexts. Nakata (2001) too talks about concepts such as the importance of connecting the past with the present and describes 'the application of the 'Cultural Interface' in schooling as beginning in Indigenous life worlds and then extending learners in the overlap with non-local realities'.

Walker and colleagues also explain that reclaiming Indigenous planning provides real experiences relevant to the effort of Indigenous peoples to assert their rights and to shape their own futures and that 'Indigenous planning is about change; it is about the process of decolonising the place and space relationships of Indigenous people and ensuring that Indigenous epistemologies and methodologies are put into planning practice now and in the future' (Walker et al, 2013, p.538). Collaborative design can be understood as a planning process that contributes to decolonising the place and space relationships of teachers involved in creating a more diverse, pluralist and democratic planning environment.

**Key Issue 7: Interdisciplinary Design Expertise: Synthesis of Knowledge practices**

When teachers engage with interdisciplinary knowledge in design contexts to co-construct programs of learning, a unique space to create, think and be challenged is created. This study suggests that collaborative design spaces can be considered as a 'third space'; a space that stimulates critical thinking, helps to develop new knowledge, and teaches participants to be open to different perspectives (Fraser, 2012). From Aboriginal perspectives the third space is a place that acknowledges

> Aboriginal and Torres Strait Islander communities have deep cultural worldviews that differ from those in the Western education system. The first space represents Indigenous ways of knowing, being and doing. The second represents Western ways. The third cultural space is a place of not knowing, of seeking understanding and of mutual respect (USQ, EATSIPS, n.p), (University Southern Queensland, Embedding Aboriginal and Torres Strait Islander Perspectives, n. p) (see Appendix #7).

The choice of problem-type is an essential element for the realisation of this space where different disciplines meet to create joint solutions, or products (such as Integrated Programs). The problem identified is central to the planning process, which in turn dictates the level of integration required and its alignment to content and assessment requirements of various subjects being integrated into a program of learning. Kolko suggests that there are three methods of formalising the synthesis or integration process in practice, including 'reframing', 'concept mapping', and 'insight combination' that emphasise teacher capacity to prioritise, judge and forge connections. (For details see Appendix #6)



Pierce, the 'father' of abductive reasoning, argues that everything we know is determined by something we previously knew and the seeds of all kinds of ways of world making are contained in abductive inference (see Fisher, 2001, p12). In Peirce's view, the goal of all inferential thinking is to discover something we do not know and thus enlarge our knowledge by considering something we do know. Collaborative design provides a safety net for such a process.

Klaassen defers to numerous researchers about aspects of successful interdisciplinary work including starting as early as possible for lifelong learning because once teachers are ingrained in a certain discipline, it is harder to lower disciplinary egocentrism (2018, p11), Engaging teachers routinely in interdisciplinary thinking, including asking teachers how their discipline might contribute to student learning about a particular issue, is an important consideration for sharing knowledge and encouraging symbioses between the disciplines (Klaassen, 2018, p.852). The art of identifying new issues of relevance and the realisation of novel pedagogical resolutions across the different disciplines that could be incorporated into a program of learning are familiar considerations for teachers designing Integrated Programs. Detailed analysis of a collaborative design process using a designer lens and analysis of Integrated Programs created is required to better understand collaborative synthesis in interdisciplinary contexts.

**SIGNIFICANCE OF THE STUDY**

A sense about who educators are professionally can be undermined in reform contexts if teachers are not part of the conversation. Reform offers opportunities for discourses that highlight teacher work practices and opportunities to develop clarity about key concepts and understandings including about 'collaboration'. What also needs to be asked of teachers in reform contexts – which is rarely asked – is about how reforms impact on teacher practice.

Being collaborative and jointly responsible for improving the profession and what happens in schools concerns teachers. So collaborating to plan learning is not just about working with complexity with diverse knowledges it is also about working together with ambiguities and contradictions and as part of teams to improve teacher work, to make teachers more visible so that they are better positioned, for example, to progress interdisciplinary knowledge, thinking and planning standpoints in senior secondary contexts. Yunkaporta, talks about

> knowing, respecting and living your own stories [as teachers and designers of learning] and bringing them alongside the stories of the place where you are… That's the ways of knowing, ways of being, ways of doing – epistemology, ontology, methodology – knowing stories of relatedness, respecting stories of relatedness, living stories of relatedness (2009, p.78).

This is a study based on the understanding that learning for teachers is enhanced when teachers are recognised as co-creators of knowledge as well as implementers of curriculum created.. Making collaborative design practice visible to teachers for consideration is important in a world increasingly interested in collaborative and interdisciplinary knowledge creation practices. This includes challenging 'fixed position' approaches about how learning is designed in schools as well as analysis that makes visible contradictions identified by teachers in the case study sites. By identifying and analysing contradictions experienced by teachers including in relation to policy and practice issues, the study is actively trying to raise awareness of contradictory policy and practice that impacts on teacher planning practices as well as teacher capacity to collaborate professionally. In doing so the analysis aims to raise awareness and suppress contradictions in education contexts. Foucault, talks about

> contradictions as surface reflections and contradiction as 'the illusion of a unity that hides itself or is hidden' … and analysis must suppress contradiction as best it can' (Foucault, 1972. p1*).*

This research about teachers collaborating to design 'Integrated Programs,' is presented as a series of case studies and provides a snapshot about what can be achieved collectively in planning contexts by teachers if there is greater clarity about both 'interdisciplinarity' and 'collaboration' in schooling from both policy and practice perspectives. Deeply reflective collaborative design work not only offers opportunities for teachers to connect with teacher professionalism domains but it is about 'letting go of trying to know everything' which in 21st Century education contexts, is increasingly deserving of our attention.

This study aims to inform policy and practice by providing rich stories that capture teacher experiences of collaborative design and the conditions that enable teachers to collaborate to work deeply with knowledge. Of particular significance, the study aims to fill a gap in the documentation of daily practice of teachers planning together in senior schooling. The complexity of that work should thus be revealed, creating opportunities for meaningful discussion about teacher professionalism as it relates to collaboration in school contexts.

Having identified seven key issues, from both scholarly and professional experience, the task of designing a study about teachers' successful practice in collaborating around integrated programming is increasingly necessary. The next chapter specifies the design choices made and this is followed by five case study chapters which are then drawn together, along with relevant additional data, in chapter 8, while Chapter 9 identifies key learning from the study.



# CHAPTER 2

## METHODOLOGY

### INTRODUCTION

To design a program of learning that has not been developed previously is a creative challenge, a privilege and a key responsibility. Opportunities for teachers to collaborate in 'contested knowledge spaces' between knowledge systems (Nakata, 2007, p.9) and be inspired by the wealth of knowledge that exists within teacher communities however, is often short-lived and fragmented. The need for teachers to engage regularly in dialogue to define and redefine self as teacher and to consolidate opportunities for 'collective efficacy' (the dominant factors influencing student achievement in schools (Donohoo, Hattie, Eells 2018, p.41), requires action across the education spectrum. It is thus timely for a study about teachers collaborating to plan learning, in the senior years of schooling.

The design elements of this study pay attention to teacher practice and the conditions that support teacher collaboration to design learning. Secondly, the research design includes a focus on some of the details of the 'collaborative design' process and experience. There is minimal descriptive research available on collaborative interdisciplinary design except general philosophical commitment enquiries about teacher professionalism and exhortations to expand opportunities. The study therefore aims to generate significant descriptions of practice as a way to provide the basis for wider analysis. Such 'rich' or 'thick' description (Geertz, 1973, p.5) requires in-depth qualitative case study to generate and share and to relate the practices undertaken to their context.

This study has identified 'collaborative design' (in interdisciplinary contexts) as 'a collaborative intervention' from which teachers have opportunities to achieve collective excellence outcomes. Kelchtermans' (2006, p.224) discussion of the complexity of collaborative interventions suggests that the research design also needs to include methods that help reveal the multiple and subtle contexts that affect collaborative success in schools and methods of inquiry to identify conditions that unpack the complexities of collaborative practice. The evidence collected for this study includes narratives about teachers sharing and designing learning collectively because they reveal details about the practice of collaborative planning

that align comfortably with the broad domains of teacher professionalism (as presented in Chapter 1, Figure 2, OECD Teacher Professionalism Index (2016, p45).

The research design for this study acknowledges teachers who have the courage to assert their professionalism through working together to develop Integrated Programs. To understand teacher capacity to collaborate and commit to collective efficacy outcomes 'to make a difference' requires a research focus on 'collaborative interventions' in schools that includes a focus on the practice of designing learning collaboratively. A case study design (Stake, 1995; 2006) has been chosen to illustrate collaborative practices adopted at the school level and shared conditions, such as school culture aspects, teacher understandings and claims about 'collaborative design', in the senior years of schooling.

A study by Loughland and Nguyen about the impact on teachers' sense of collective efficacy as a result of their participation in a collaborative professional learning model determined that 'the construct of teacher collective efficacy needs to be moved out of its measurement paradigm into a concept malleable enough for the purposes of professional learning' (2020, p4). This study is shifting the 'collective efficacy' measurement paradigm by identifying and offering *collaborative design* as a practice that impact on teacher learning, professionalism and teacher efficacy.

## THEORIES THAT INFORM THE RESEARCH DESIGN

A number of theories inform the research design for a study about "teacher cooperation when constructing, de- constructing and re-constructing knowledge; planning together" (Salonen et al 2015, p.8). The theories provide a foundation on which to progress conceptual understandings about 'collaborative practice' and 'teacher professionalism' and the mutually dependent and potentially constructive relationship that evolves when these concepts are considered simultaneously to explain and promote the work of teachers. Theories of relevance include Engeström's Activity Theory (2000) and Kemmis's 'Practice Theory' and theory of Practice Architectures (2009a). The study also draws upon 'Cultural Interface Theory' (1995, 2007) and Indigenous Standpoint Theory' (Nakata, 2007).
See Figure 3: Research design for collective teacher futures.



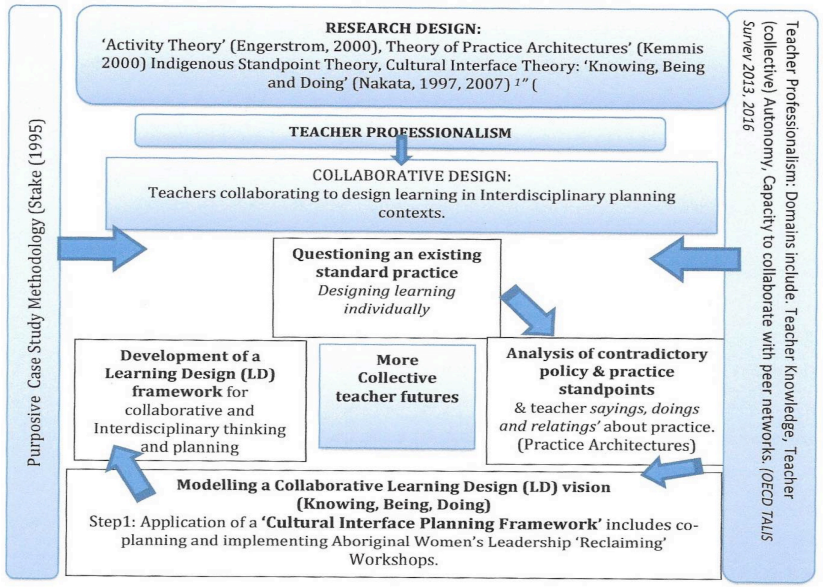



FIGURE 3: RESEARCH DESIGN FOR COLLECTIVE TEACHER FUTURES

**Research Design and Activity Theory**

Engeström's Activity Theory (2000, p.960) provides a cycle of expansive learning, which begins with the '*action of questioning an existing standard practice'*, which in this study is about questioning the practice of designing learning individually. Engeström's cycle then proceeds to the '*identification and analysis of contradictions'* evident in transcripts of interviews and focus group discussions. Teacher claims about collaborative design practice include teacher 'sayings, doings and relatings' (Kemmis, 2009a) about changes in thinking and practice as an outcome of their engagement in designing learning with others. Teachers designing learning collaboratively appear to be challenging existing historically developed architectures of daily practice (Kemmis, 2009a) and contesting the space that exists between disciplinary and interdisciplinary knowledge for the design of curriculum.

Engeström's cycle then proceeds to '*modelling a different vision'.* In this study, the modelling of a different vision involves the researcher engaging at the 'Cultural Interface' with Aboriginal women in workshops about 'reclaiming' Aboriginal values and knowledge creation practices. This includes 'Yarning' and 'Being' at the Cultural Interface to promote shared knowledge and understandings about values and knowledge. This challenge to Western knowledge systems offers a way to identify new practices of collaborative practice.

The final step in Engeström's cycle is about '*examining and implementing';* and in this study, it is about 'listening to Aboriginal discourses and identifying narratives about key values and knowledge creation practices that could form the basis of an alternative planning learning framework with a focus on collaborative design practice.

**Research Design and 'Cultural Interface' Theory.**

Nakata argues that *'*an Interface approach is not simply a vehicle for Indigenous transition into mainstream, but a source of innovation, critical thinking and problem-solving skills that is relevant for learners of any culture' (Nakata, 2007, in Yunkaporta, 2009, p.53). Collaborative design is a process that demands teachers plan learning at the interdisciplinary, disciplinary interface. Nakata describes the 'Interface' as a 'site of struggle over the meaning of our existence' (2007a, p. 210). So too, when teachers design learning collaboratively they are engaged in a struggle



over knowledge and the meaning and relevance of particular knowledge in a program of learning. The premise for this study is that collaborative design contributes to teacher professionalism more than curriculum designed individually.

The planning and implementation of 'Reclaiming Workshops' for this study (Appendix #2) provides a 'Cultural Interface' opportunity for the development of learning design frameworks that aim to serve as organisational structures to challenge teacher thinking, discourse and practice about designing learning in 'contested knowledge spaces' (Nakata, 2007, p9) such as collaborative and interdisciplinary design spaces. It is also an opportunity to include Aboriginal planning standpoints in mainstream education contexts.

By identifying narratives about 'being', 'knowing' and 'doing' (Martin et al, 2003) by listening to Aboriginal women discuss values and knowledge creation practices of relevance to them, the aim is to conceptualise a collaborative design framework that promotes collaboration, knowledge sharing and collaborative design practices. After nearly two decades of senior secondary reforms with a focus primarily on the teaching and assessment of disciplinary content, it is important to offer alternative frameworks and narratives that highlight planning learning, collaboration and diversity of understandings about teacher professionalisation.

**Research Design and 'Practice Architecture' Theory**

Kemmis' concept of 'Practice Architectures' helps to identify the historical conditions that have led to sayings, doings and relatings that obstruct, enable or transform practice (2009a). Kemmis summarises 'the study of practice; by emphasising that practices are always 'embedded in sets of social relationships, as meaningful activities that endure to produce products and transform states of affairs' (2009a, p.22). He goes on to elaborate how practices are created informally and over time, and in the process, sayings, doings and relatings become entrenched. Their discursive forms (sayings) , their characteristic arrangement of objects as part of work (doings) and their social arrangements (relatings) become distinct and recognisable as from a particular field such as education or law (Kemmis, 2009a, p.24). This study suggests that entrenched practices are more likely to be challenged from a shared position where practices are collaborative and where knowledge is

constantly challenged. The research design for this study therefore includes the identification of conditions and teacher *sayings, doings and relatings* about collaborative design practice to identify emergent curriculum design possibilities and practices that could be applied to promote collaborative planning in schools.

**Research Design and 'Standpoint' Theory**

Standpoint theory proposes that authority to know something is rooted in individuals' positioning (their perspectives). Standpoint theory sheds light on the specific circumstances and insider knowledge available only to members of a certain collective standpoint (Ryan, 2005).

The study uses the word 'standpoint' to describe the common lived experiences of being teacher, known only to teachers. Frustrations arise when 'others' with greater power determine how teachers are seen or unseen; what teachers do or don't do, or what teachers teach or don't teach. Likewise, only Aboriginal people are in a position to articulate Aboriginal standpoints and it is therefore important to acknowledge those standpoints gifted to this study by Aboriginal leaders in the schooling sector and in the community, through workshop participation.

Standpoint theory provides ways to reflect on personal bias and power as researcher and teacher. It demands consideration of the relations between one's own positioning and the standpoint of others: how others know, understand, think, plan and teach. The research has been designed so teacher 'standpoints', that enable or obstruct teacher capacity to collaborate and innovate within particular conditions, are made visible.

Following is a summary of theories guiding the Research Design considerations that will be applied to gather data for analysis. Activity theory guides the research journey; Theory of Practice Architectures question existing core teacher practices that are impacting on teacher capacity to express teacher identity and professionalism; Standpoint theory challenges dominant knowledge and understandings and ways of being, knowing and doing the work of teacher and seeks inclusion of 'other' knowledge in education planning contexts. See Table 1, below, a summary of theories guiding the Research Design.



**Summary of theories guiding the Research Design.**

| |
|---|
| **Activity Theory**; (Engeström, 2000) (A cycle of expansive learning)<br>*Research design actions include:* |
| **Questioning an existing standard practice:** i.e. the practice of designing learning individually.<br>**Analysis of contradictions**: Identify contradictory policy, practice, standpoints that demands individual actions and impact the capacity of teachers to collaborate<br>**Model a different vision:** Identify schools, standpoints, and practices with a collaborative rather than an individualistic learning design vision.<br>**Develop a new Learning Design framework** using learning from Aboriginal Reclaiming Values and Knowledge Creation workshops + School Case Study data. |
| **Theory of 'Practice Architecture'** (Kemmis 2009)<br>*Research design actions include:* |
| **Identification of structural conditions**; 'practice architectures' built over time that obstruct or enable collaborative practice.<br>Identify teacher practices around interdisciplinary planning and design through teacher sayings, doings and relatings)<br>**Identification of school and policy conditions** that support the transformation of practice from designing learning individually to more collaborative practices. |
| **'Standpoint Theory'** and 'Cultural Interface theory', (Nakata 1997, 2007)<br>*Research design actions include***:** |
| **Identification of contradictory policy demands on teacher practice**.<br>Identify Aboriginal standpoints that reflect interdisciplinary planning practices that challenge dominant policy discourses.<br>Identify opportunities for engagement with Aboriginal knowledge (ie identify collective discourses and narratives that describe interdisciplinary design practices<br>**Design Reclaiming workshops in collaboration with Aboriginal teachers/leaders at the Cultural Interface** to progress de-colonial Aboriginal futures including the reclamation of Aboriginal values and knowledge creation practices in mainstream curriculum planning.<br>**Engage in learning at the 'Cultural Interface** (ie creation of collaborative design frameworks to generate ways to further 'de-colonial' Aboriginal futures'). |

**TABLE 1**: A SUMMARY OF THEORIES GUIDING THE RESEARCH DESIGN

**Self-reflection' and Research Design**

The study is partly self-reflective. The researcher recalls professional experiences of teacher practice to support research design decisions. For example, as a Curriculum Implementation Officer for the Australian Curriculum (secondary), I was required to engage deeply with teacher practitioners in the interpretation and adaptation of curriculum policy for implementation that supported the specific aims of schools, school leadership, teachers, students (including a specific focus on Aboriginal students) in remote, rural and metropolitan secondary schools. Long term relationships built on trust and reciprocity nurtured over time in some of the schools taking part in this study, have helped to minimise the distortion of discourses related to teacher planning practices. Researcher professional experience has also influenced the design, the development of key questions and the choice of methodologies for this study.

**Fields of Knowledge**

The fields of knowledge explored for this study include interdisciplinarity and teacher engagement with interdisciplinary knowledge, teacher professionalism and professional collaboration, teacher as designer and 'knowledge creator' and Aboriginal values and knowledge in education planning contexts

The fields of knowledge taken into account in the study are shaped by a search for greater transparency about teacher professionalism. The fields reflect a journey about ways to challenge the hierarchies of knowledge in schooling and how decisions are made about what counts as worthwhile knowledge in teaching and learning contexts. The fields of knowledge outlined here and in the key issues in Chapter one, guide the choice of both data collection and analysis. The methods chosen aim to make visible the practices, knowledge and understandings about teachers working collaboratively, teachers achieving collective autonomy and teachers transforming practice from individual to more collective practices. Fields of knowledge about Aboriginal standpoints offer alternative knowledge perspectives about ways of 'knowing, doing and being and valuing' teacher, which will be included in alternative learning design frameworks in the final chapter (Martin et al, 2003).



**WHY CASE STUDY METHODOLOGY?**

Case study is one of the most frequently used qualitative research methodologies. Robert Stake's (1995) approach to case study aligns comfortably with this researcher's epistemological orientation. Stake talks about notions of knowledge and reality, about constructivism and existentialism that he believes should be the epistemologies that orient and inform qualitative case study research 'since most contemporary qualitative researchers hold that knowledge is constructed rather than discovered' (Stake, 1995, p.99).

Because there is limited scholarly practical research about collaborative design in interdisciplinary senior schooling contexts, a rich case study approach is needed to illuminate the issues that could be taken up by other researchers. Purposive Case Study Methodology (Stake 1995), including individual interviews, document collection and focus group discussions, provides opportunities for teachers to both reflect upon, and be inspired to provide, rich descriptions about the practice of designing learning collaboratively in interdisciplinary contexts. These forms of dialogue are complementary and consequently what is said or not said in an interview may be built upon or prompted in a focus group discussion context or vice versa.

Each of the key case study sites has ventured into interdisciplinary 'collaborative design' realms, yet their reasons for doing so are based on diverse philosophical standpoints. These include for the purposes of 'interdisciplinary thinking and learning', to 'engage students in their learning', and to design learning that supports 'student well-being'. The methodology therefore needs to make visible, through the presentation of rich data, the practices involved in designing learning together as well as teacher capacity to collaborate, teacher autonomy and the transformation of teacher practice from individual to more collective practices – all of which fall under the various domains of teacher professionalism, (OECD Professional Teacher Index, 2016).

Case Study Methodology allows teachers to tell rich stories about practice and the challenge of collaborating with colleagues to achieve something 'new' collectively. Teacher capacity to collaborate is not only a key issue in terms of its emergence as

a recognised and valid form of teacher practice, it has also been constructed in policy as a key education solution. It is part of a complex web of education policy rhetoric that undermines the capacity of teachers to collaborate by demanding individual actions. Being indifferent to teacher capacity to collaborate undermines professionalism that is conditional on the 'capacity of teachers to collaborate' in the first place.

Purposive case study methodology also allows the researcher to identify, name and acknowledge the various elements of the domains of teacher professionalism that help build 'collaborative expertise' and progress 'teacher professionalism'.

For example, 'advancing teacher influence' (Donohoo, 2016) is dependent on site specific 'leadership responsiveness' in prioritising 'professional collaboration' and 'collective autonomy' so that teachers are better positioned to focus on reaching 'consensus' about planning, teaching and learning. Donohoo emphasises the significance of school leadership teams 'paying attention to the details and undercurrents in a school including anything preventing a team of teachers from feeling supported' (2016). Paying attention to the details means caring about teacher professionalism individually and collectively and noticing why, when, how and what can be done organisationally and systemically to help teachers collaborate as part of standard teacher practice.

Case Study methodology allows teachers space to consider changes to practice and reflect on old, new or developing 'practice architectures'; new sayings, doings and relatings (Kemmis, 2009a, b) to transform teacher practice from individual and disciplinary to more collaborative and interdisciplinary. Case Study methodology provides a much-needed space for teachers to reflect on professional collaboration and how it might be refined for emergence elsewhere. Stake also argues for a flexible case study design that allows researchers to make major changes after they proceed from design to research. This study made changes to the research design about working closely with Aboriginal people to introduce alternative knowledge systems to address issues and questions arising during the course of the case study.

Stake also suggests the initial design should always include issues and issue questions (Yazan, 2015, p.140). In this study, questions derived from the key issues



about teachers working collaboratively have helped to determine the research questions. The issues identified include the lack of conceptual clarity about collaboration in policy and practice and the unquestioning acceptance of entrenched disciplinary standpoints in schooling generally.

The unavailability of data about the Integrated Program has helped to determine the direction of the research. The questions arising, therefore relate to the invisibility of teacher design practice in interdisciplinary contexts and the ongoing struggle for acknowledgement of teacher expertise. See Key Issues Identified and Key Questions arising (Table 2).

**KEY QUESTIONS**

Key questions are a result of synthesis of key issues identified. The overarching question has evolved to include a focus on teacher professionalism and teachers collaborating effectively to design learning (Salonen et al, 2015). ***How the practice of designing learning collaboratively helps teachers reclaim professional practice*** includes reference to 'collaborative design' as a basis for 'collaborative practice and collaborative excellence' in schooling (Eells, 2011; Hattie, 2015; Donohoo, 2016).

See Table 2 below: Summary of Key Issues identified and Key Questions arising

**Table 2: Summary of Key Issues identified and Key Questions arising**

*How does the practice of designing learning collaboratively help teachers reclaim professional practices in the senior years of schooling?*

| Key issues identified | Key Questions arising |
|---|---|
| Schooling is not organised around teacher work practices and teacher capacity to collaborate despite research that shows 'intense collaboration' progress's teacher practice and student outcomes. | **KEY QUESTION**: *How does the practice of designing learning collaboratively help teachers reclaim professional practices in the senior years of schooling?* |
| Disciplinary versus interdisciplinary knowledge divide impacts on teacher engagement in integrated and collaborative planning approaches<br>There is no official SACE data about Integrated Programs because it is not assessed as a stand-alone subject. A lack of data does not encourage interdisciplinary thinking and planning in senior schooling ie STEM contexts. | *How do schools build teacher capacity to work within and against SACE policy to develop rich interdisciplinary programs? …… when 'capacity building' is 'any strategy that increases the collective effectiveness of a group of teachers'.* |
| Minimal recognition or focus on collaborative expertise, collective excellence (Hattie 2015) and collective efficacy (Eels 2011) in schooling. | *How are teachers collaborating to design Integrated Programs and what is the role of teacher as creator of knowledge in collaborative planning contexts?*<br><br>*What metaphors best describe teachers collaborative design experiences?* |
| Invisibility of Aboriginal value systems and knowledge creation practices in mainstream planning practices. | *What could a learning design framework look like that is inclusive of Aboriginal standpoints to create knowledge and plan collaboratively?* |

Questions seek details about school cultures, teacher dispositions, school leadership decision-making, teacher capacity to collaborate and teacher professional practices. Sub-questions are about how 'designing learning with others' results in changes to teacher practice related to teacher professionalism including teacher 'capacity to network and collaborate', 'teacher knowledge' and 'teacher (collective) autonomy' (OECD Professional Teacher Index, 2016).



Because the research is in schools where teachers are designing 'Integrated Programs' it is important that questions make links to the influences, including interdisciplinarity, that are motivating teachers to collaborate to design learning in the first place. A question therefore is asked about *how schools develop teacher capacity to collaborate 'when "capacity building" is any strategy that increases the collective effectiveness of a group of teachers'* (Levin and Fullan, 2008, p295) Other sub-questions are about *how teachers collaborate for knowledge building, schools as 'knowledge building organisations and the role of teacher as 'knowledge builder'* described by Schleicher (2012, p.38) and Chan (2011, p.147) as very important educational goals for any future position on teacher work and schooling. Additionally, '*how teachers collaborate to design Integrated Programs?'* provides details about a detailed process about designing learning collectively.

The issue of working with complexity in interdisciplinary design contexts raises questions about *how teachers work within and against SACE policy to develop rich integrated tasks that meet the assessment requirements of specific individual subjects.* The study here reaches out to alternative knowledge systems to help explain planning practices in interdisciplinary contexts.

A 'summary Interview survey' is included in the design of this study for practising teachers interviewed in the case study sites. Teachers responded to five questions about *'what the overall experience of designing learning collaboratively is like'*. This included *'personal dispositions needed to engage in collaborative design work'; 'reasons for school and teacher commitment to collaborative design work' and 'school cultural factors and strategies that support collaborative design work'* (See Summary Interview Survey: Appendix #4.)

Teachers were asked to consider metaphors to describe their collaborative design experiences as well as what their future learning design intentions were in relation to seeking ongoing collaborative design opportunities. Teacher perceptions about collaboration are identified by Strype et al (2004, p.806) as an important research subject.

**CASE STUDY SITES**

Schools were identified as a result of 'insider' researcher knowledge about schools and teachers promoting and implementing the Integrated Program SACE option that requires the integration of content across subjects. Knowledge was gained through engagement in curriculum leadership positions, including as a Curriculum Implementation Officer for the SACE (2008-2012) and then for the Australian Curriculum (2012-2016).

The number of schools across this state with a whole school commitment to interdisciplinary and collaborative design and the Integrated Program option is small, but characteristics of the three key sites identified all align comfortably with Miles and Huberman's (1994, p.34) sampling strategies that include sites with strong links to the conceptual framework provided for the study and sites that include teachers who are champions of collaborative design practice. Some of the sites have also generated rich information about the emergence of and collaborative design experiences of teachers that suggests teachers in these sites have experience in providing explanations about interdisciplinarity that are convincing and can be generalised in the findings. The three other sites identified are in the early stages of developing interdisciplinary capacity as part of their engagement with Statewide STEM (Science, Technology, Engineering and Mathematics) program planning initiatives.

The three Key Case Study schools identified have all embraced interdisciplinary thinking and planning in various iterations for periods exceeding fifteen years or more to complement their school visions and philosophical standpoints. Each school has been an early adaptor of the 'Integrated Program' reforms (2008-2012) to progress their school's interdisciplinarity visions.

One of the schools has a reputation as a leader in interdisciplinary thinking, planning, teaching and learning to progress and support STEM outcomes. This site has taken significant steps in transforming teacher 'practice architectures' and the organisation aspects of schooling to cater for interdisciplinarity and the capacity of teachers to collaborate.



The second site has identified Integrated Program options as a means of achieving student well-being for students at risk of not completing the SACE (the South Australian Certificate Education). A connected, holistic program of learning is seen as a way to retain students in schooling. Teachers at this site were designing Integrated Programs long before the 'Integrated Program' option was introduced in (2008-2012). Interdisciplinarity thinking, designing and learning and the Integrated Program option have provided a system-approved vehicle for the work already achieved. Two of this school's Integrated Programs, for example, are proudly visible on the school website including the 'SACE for Work' package and a 'SACE for University package' (Australian Tertiary Admissions Results (ATAR) package). Other sites are also increasingly promoting Integrated Program options including an Aviation Integrated Program as part of school cluster arrangements with the University sector.

The third key site is a semi-rural school with progressive structural reform visions including, at year 10, a 'Big Picture School' philosophy that provides an organisational structure that supports interdisciplinary approaches for the design of learning and teacher capacity to collaborate.

Two additional schools were also identified because of their engagement in STEM professional learning opportunities that including the development of STEM 'Integrated Programs' using interdisciplinary and collaborative thinking and design approaches. Teachers in these sites are encouraged to design units of work using content knowledge from across the range of STEM subjects (Science, Technology, Engineering, Mathematics). Both STEM focus sites have engaged in at least one to four years of a State STEM Initiative involving opportunities to engage in professional learning with other STEM school-based teachers with expertise in STEM planning and implementation. The University sector is also part of the STEM professional learning to develop sustainable models of best practice of STEM integration and strategic planning.

**ETHICAL CONSIDERATIONS**

Ethics approval for this study was granted by Victoria University, Melbourne, (HRE14-097) and the Department of Education and Child Development (DECD) in South Australia (CS/14/513-11) 25th September 2014.

The research design issue of 'insider' in contrast to 'outsider' research positioning is an ethical consideration in relation to 'a teacher interviewing other teachers'. In this study, teacher, interviewing teachers has helped to determine how the data is collected and analysed. Key 'insider' challenges identified by Fleming (2018, p312) include; minimising the potential for implicit coercion of the participants, acknowledging the desire for positive outcomes; ensuring tacit patterns and regularities are not taken for granted; and awareness too of the potential conflicts about being a teacher and researcher within the same context.

The challenge identified by Fleming requires a focus on clarity of information and communication related to participant engagement in the study. Familiarity and empathy issues are more challenging and relate to the 'desire for positive outcomes' and 'blindness to tacit patterns emerging in the data'. In this study these challenges are moderated through the inclusion of an initial conversational approach to the interview that includes talking about the intent, sequence and interview questions. This is followed by a less familiar approach when delivering questions.

Ethical questions about confidentiality and anonymity also had to be addressed. Care has been taken to minimise the likelihood of quotes being traced back to particular schools or people in schools because working deeply with interdisciplinary knowledge and collaborative planning approaches is still considered somewhat contentious, including case study sites experiencing excessive levels of scepticism and pushback responses at a systems level while also receiving international recognition for education innovation.

A Case Study about teachers working as Implementation Officers for the Australian Curriculum (2012-2016) demanded particular attention to 'familiarity' issues because the researcher had previously worked in this role. Particular attention was therefore paid to emphasising voluntary participation and opportunities for group discussion.



Additionally, as a result of long-term professional leadership roles in Aboriginal education, the researcher has 'insider' appreciation about Aboriginal process and understandings in education contexts. Because of 'insider' knowledge, emphasis on researcher as listener and learner was required for the implementation of the Aboriginal women's workshops, included as part of the design for this study. The Aboriginal Manager also agreed to reflect on workshop data and further articulate Aboriginal participant narratives that we agreed reflected planning learning practices (process and narratives) evident to the researcher in the key case study data. Data that reflects Aboriginal knowledge and planning processes can then be taken into consideration to describe what is evident when teachers design learning collaboratively. The application of Aboriginal narratives also challenges eurocentric values and knowledge in education contexts.

Beginning teachers in the case study sites and Aboriginal women and senior years students participating in the Aboriginal Women's Reclaiming Values and Knowledge Leadership Workshops, are the most at-risk groups in this study. In collaboration with the co-facilitator of the Workshops (See Appendix #2), participants engage in face-to face discussions about ethical and integrity issues regarding ownership of knowledge, consent and authorship pertaining to knowledge shared and objects Somekh and Lewin (2011, p.150), advise all communication with at risk participants should avoid on-line environments. Consequently, all participants in this study received details about the research topic and any possible privacy, consent and authorship issues arising, verbally, via phone or face to face as well as via email. All Interviews and Focus Group discussions were voluntary and included opportunities for discussion about such issues, together with explicit discussion of the right to withdraw at any time.

As a non-Aboriginal researcher, the study builds upon existing relationships in existing structures using existing protocols at the local level. For example, planning included responding to the six core values outlined in the Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research (NHMRC, 2003). These considerations are based on participatory processes that include sustaining reciprocal relationships. The Aboriginal co-planner and co-facilitator of the workshops for example, has collaborated with the researcher on previous projects.

**PARTICIPANTS AND THEIR CONTRIBUTIONS**

Contact was made with five distinct groups: 1) Education Leaders in curriculum and policy positions that includes Curriculum Implementation Officers; 2) Principals and members of school leadership teams from the case study sites; 3) Classroom teachers designing 'Integrated Programs' collaboratively, including in STEM planning contexts and 4) Aboriginal Leaders, two of whom are educators. In addition, this group included 5) 20 Aboriginal women who were participants in two 'Reclaiming values and knowledge creation' Workshops.

Education Leaders in curriculum and policy positions provided senior years curriculum and interdisciplinary history and policy insights. Nine education leaders interviewed talked about opportunities and barriers related to interdisciplinary and collaborative curriculum work in schools and challenges in managing curriculum reform agendas.

School leaders were asked about the disciplinary and interdisciplinary knowledge divide in curriculum as well as teaching as a 'knowledge profession' and schools as knowledge-building organisations. The role of teachers as creators of curriculum rather than as implementer was included in discussions.

The most significant group in the study are Principals (P) and Senior Leaders (SL) or Teacher Leaders (TL) in site based leadership teams and most significantly classroom teachers from the three key case study sites. 'This group was asked to reflect on their school's response to recent curriculum reforms, school visions, professional collaboration issues, interdisciplinarity and teachers designing learning collaboratively. Teachers interviewed included early career teachers (ECT) (0-3yrs experience) and experienced teachers (ET) (more than five years' experience).

The semi structured interviews and focus group discussion questions for teachers related to teacher professionalism, teacher capacity to collaborate and the practice of designing learning in interdisciplinary contexts. (See Appendix #3.) The following headings determined a specific set of questions for practising teachers that included 'collaboration and professional practice', 'curriculum reform and collaborative practice', interdisciplinarity and teacher professionalism (teacher knowledge, teacher autonomy, teacher capacity to collaborate with peer networks); 'personal experience



of and teacher claims about outcomes and practice transformations related to collaborative design practice'. Teachers were also asked to provide metaphors that describe their collaborative design work.

Senior Leaders (SL) and Teacher Leaders (TL) of site based Leadership Teams and teachers at the site level engaged in semi structured interviews and focus group discussions. A post interview summary survey also asked teachers to reflect on design experience and future intentions to seek 'collaborative design' opportunities. (See Appendix #4.)

Teachers leading STEM reform efforts and classroom teachers from three STEM sites also participated in the study. Participants had all engaged in 1-4 years of a national STEM professional development program with a focus on integrative synthesis of STEM subject knowledge for the creation of 'Integrated Programs' for students in junior secondary schooling contexts (Years 8-10).

The schooling sector participants included interviews with six Principals or Curriculum Leaders, five interviews with experienced teachers and five interviews with early career teachers. Twelve teachers also took part in three Focus Group Discussions. This resulted in 14 Transcripts for analysis (12 interviews and 2 Focus Group Discussion transcripts).

Contact was made with Curriculum Implementation Officers for the roll-out of the Australian Curriculum (2012-2016). Ten Curriculum Officers took part in a Focus Group Discussion and five in interviews about their role. Questions asked were developed with reference to Gilbert's Australian Curriculum Professional Learning Flagship program about leading curriculum change (ACARA, 2011). The interviews aimed to reveal collaborative practices observed in schools and strategies that supported school leadership teams and teachers to plan and engage with the key elements of the AC Australian Curriculum.

As an Implementation Officer at the time, I was not aware of literature about teacher collaboration and professionalism – for example, Gilbert's (2011) vision, Eels' (2011) findings about collective efficacy or Hattie's (2015) understandings about 'collaborative excellence'. Nor did I engage at that time in discourses about teacher professionalism. My focus as an Implementation Officer for the Australian Curriculum

was more about building teacher familiarity with the mechanics of using, designing, implementation and assessment of learning and less about teacher professionalism, knowledge, dispositions 'collaborative expertise'. My decision to build awareness about the mechanics of the AC in junior secondary or AC links to SACE in senior secondary schools was, in retrospect, at the expense of long-term structural and organisational change and respect for teacher capacity to collaborate.

The fifth group are Aboriginal teacher leaders and Aboriginal women who participated in leadership workshops co-designed and facilitated with a local Aboriginal Manager of Aboriginal Women's Programs. The workshops were about reclaiming values and knowledge creation practices. Participants included Elders and Aboriginal women mainly from the government sector. The workshops introduces participants to a set of values*:* respect, reciprocity, equality, spirit and integrity and 'survival and protection' (NHMRC, 2003, p8) and knowledge creation definitions: Holistic knowledge practices, Deep narrative, Communal knowledge, Elder knowingness (Yunkaporta, 2007, n.p.) with the intent of inspiring discourses about 'knowing, being and doing' (Martin et al, 2003) collectively.

The workshops demanded 'cultural interface' considerations, and engaging in conversations about knowing differently about planning and collaboration concepts. The process aimed to 'harness the knowledge of two cultures in order to create new knowledge' to achieve a 'balance between Indigenous methodologies and conventional academic methods' (Yunkaporta, 2009, p.170).

The Reclaiming Workshops (Appendix #2) engaged participants in sharing understandings about Aboriginal values and knowledge creation practices and consider too about how they can be applied, personally and professionally. Data collected includes data from the workshops about 'reclaiming values' and 'knowledge creation practices and interviews with the Aboriginal co-facilitator and an interview with two Aboriginal leaders working in the University sector. Narratives women share about values, collaboration and knowledge creation practices will be collated followed by a reflection on the data with the Aboriginal co-facilitator. 'Collective' narratives and understandings shared will contribute to answering the key questions.



## DATA ANALYSIS

Table three summarises the discussion to this point and provides a description of the eight data collations aligned with specific analysis methodologies to make visible teacher practice to answer the study's key questions.

Table 3: Summary of Data collation Descriptions aligned with analysis methods

| **Descriptions of Data collated** | **Analysis of Data methodologies** |
|---|---|
| **CONTRADICTORY POLICY AND PRACTICE DATA** and impact on teacher practice / professionalism | **Analysis** of contradictions: with reference to Foucault' "analysis must suppress contradiction" (1972, p150) |
| **DATA about CAPACITY BUILDING** and COLLABORATIVE DESIGN PRACTICE<br>- School leadership responsiveness data<br>- Teachers' sayings, doings, relatings and capacity to collaborate data.<br>- Teacher claims about epistemological shifts from individual to collective<br>- Collective autonomy[1] claims data | **Analysis** of teacher claims about 'mutual core competence of teacher to interact effectively' (Salonen et al).<br>**Analysis** of claims using 'intensities of professionalism' (Bourke, 2013*)*<br>**Analysis** of claims with reference to Mausethagen, Molstad (2015, p8) 'dimensions of professional autonomy' |
| **SACE 'INTEGRATED LEARNING' SUBJECT DATA** (2012-2017) (in the absence of SACE 'Integrated Program' data). | **Analysis** of Official SACE single subject in relation to student and teacher interest in interdisciplinarity approaches. |
| **TEACHER AS KNOWLEDGE CREATOR DATA** from Aboriginal Reclaiming Workshops discourses and narratives about the collective perspective. | **Analysis of transcript data** about teacher as 'knowledge builder/creator.<br>**Analysis** of data about the expertise of teachers is aligned with the domains of teacher professionalism and 'knowledge building' theories. |
| **SUMMARY INTERVIEW SURVEY DATA** Personal dispositions, motivations, school culture factors. | **Summary Survey analysis** adapted from Davis 2013, (CREANOVA Project). |
| **DATA ABOUT AN INTERDISCIPLINARY, PLANNING LEARNING PROCESS** in one of Case Study sites | **Analysis** of data with reference to OECD Professionalism Index (Schleicher 2016) |
| **ABORIGINAL VALUES & KNOWLEDGE CREATION PRACTICES DATA** in mainstream schooling | **Analysis** of discourse and narratives in response to Aboriginal Values and Knowledge Creation Practices definitions (Yunkaporta, 2007) |
| **DATA about METAPHORS** teachers use to describe collaborative design practices. | **Analysis** with reference to Klein's observations about shifts in metaphor descriptions from static to dynamic networks, (2007, p21). |

The analysis begins with the identification of various repeated themes from interviews and focus group discussions, followed by the collation and consideration of data. A range of themes were identified: Contradictory policy and practice, Teacher capacity to collaborate, Teacher engagement in collaborative design practice, Teacher as knowledge creator, Collaborative design practice and Aboriginal values and knowledge creation practices in mainstream planning. These themes represent the collective voice of 'teacher capacity to collaborate to design learning' and how teachers experience professionalism in collaborative design contexts as revealed by site leaders and teachers engaged in designing Integrated Programs collaboratively.

Analysis of contradictions experienced across the case study sites highlight the impact of policy and practice decisions on the capacity of teachers to collaborate to design learning. For example, teacher judgment and capacity to work together is highly valued but often, existing policy contradicts this, turning teacher work into individual actions and the individualisation of the teaching profession. By identifying contradictions the aim is to by make visible through the research that which often remains invisible (1972).

Analysis about how teachers' experience professionalism is a key consideration for analysis across the case study sites. The analysis draws on Bourke et al.'s research about how teachers' experience professionalism in order to highlight how teachers experience professionalism in collaborative design contexts.

> In Australia, the promulgation of policies, ...has seen a discourse of performativity that privileges measurable outcome goals, redefining earlier notions of teacher professionalism (Bourke, Lidstone and Ryan, 2013, p1).

The prioritising of data about teacher professionalism across all the case study sites includes analysis in relation to claims teachers make about knowledge, autonomy and capacity to collaborate. This focus provides consistency across sites and evidence of teacher resistance to a performativity culture through a focus on collaborative design practice. Data for analysis includes teachers shared collaborative experiences, concerns and contradictions experience when designing learning together and teacher and leader statements about anything preventing a



team of teachers from feeling supported (Donohoo, 2016).

Teacher claims about professionalism specifically are aligned with the descriptions of professionalism shaped by Bourke et al (2013, p.5) about teachers' 'intensities of professionalism'. This study assumes the standpoint that 'interdisciplinary design contexts' are inextricably linked to 'leadership' rather than 'performativity' outcomes and, therefore, analysis of teacher statements in this study, aligns with Bourke et al 'assertive resistance', 'aspirational resistance' or 'overt resistance' leadership focused definitions of professionalism, rather than the various performativity definitions of professionalism shaped by Bourke et al.

Analysis of a detailed description of a collaborative design process by a curriculum team manager responsible for designing and renewing Integrated Programs is also included. Analysis includes, once again, teacher professionalism claims with reference to the domains of teacher professionalism' (OECD Professional Teacher Index, 2016). The analysis provides evidence about *'practices that advance teacher professionalism' and strategies about 'how schools develop collective expertise'.*

Analysis of teacher claims about autonomy is aligned with Mausethagen and Mølstad's (2015, p.8) two 'dimensions of professional autonomy' that includes the *'will and capacity to justify and develop core practices'* and *'the will and capacity for self-governance'*. Teacher claims about 'autonomy' include comments about the extent of teachers' decision-making power such as making decisions about teaching content, course offerings, employment of teaching staff and opportunities for information exchange to maintain standards.

Analysis of teacher statements about the transformation of practice from individual to more collaborative practices in interdisciplinary contexts are aligned with Andreotti's suggestion that such experiences 'help shift educators' epistemological understandings about knowledge, curriculum, teaching and learning' (2012, p.2).

Donohoo (2017) lists key actions to advance teacher professionalism including 'goal consensus', 'advancing teacher influence', teacher knowledge about one another's work, cohesive staff, site leadership responsiveness and effective systems of intervention. Actions to advance teacher professionalism are identified in the case

studies to highlight links between collaborative practice and specific actions used in schools to progress teacher professionalism and 'collective excellence'. This evidence is considered in the development of frameworks to encourage teachers to collaborate to design learning and are presented in the final chapter.

Analyses of metaphors provided by teachers as part of a Summary Survey about collaborative design work explores Klein's observation about the shift that occurs in the move to interdisciplinarity 'from the static logic of a foundation and a structure to the dynamic properties of a network, a web, a system, and a field' (2000, p.21).

A summary of survey data analysis is about teachers' final thoughts about what it takes to successfully plan collectively and, to address the absence of data about 'Integrated Programs', this study includes analysis of data about a single subject framework subject which was introduced in (2008-2012) called 'Integrated Learning' which suggests the potential for opportunities to engage in collaborative design practice. Analysis of official SACE data about a single subject framework subject includes data about the number of completed student enrolments, 2012 to 2017 in the Interdisciplinary suite of subjects that includes the subject Integrated Learning, Data about the 'Integrated Learning' subject specifically provides an insight about school leadership and teacher interest in more integrated planning and teaching approaches as well as student interest and engagement in interdisciplinary and more integrated learning opportunities.

Analysis is included too about changes in teacher practice from individual to more connected and collaborative practices. This study explores changes in teacher practice around a core activity of curriculum design work. The focus of the analysis aligns with a definition of innovative change described as

> 'the implementation of a new or significantly changed process or practice or organisational method observed at the education system level, concentrating particularly about changes in practice' (OECD, 2016, p.20).

In this study the changes relate to a shift in how teachers plan learning from individual to more collaborative. Analysis of changes to teacher practice is illustrated largely through teacher 'claims' about planning learning collaboratively in interdisciplinary senior school contexts. The evidence shared is both pedagogic and organisational. Changing planning practices from individual to more collaborative



approaches involves exploring teacher 'capacity to collaborate' and provides an indication of the significance teachers attach to interdisciplinary knowledge, thinking and learning in the absence of official senior years data about the 'Integrated Program' learning option (in this particular State context).

## INTRODUCTION TO THE CASE STUDIES

In the Case Study chapters that follow, school leadership team members and teachers provide descriptions about the struggle to collaborate and design interdisciplinary programs as well as insights about conditions that support or constrain collaborative design work. There are a diversity of perspectives provided by Principals (P), School Leaders (SL), Teacher Leaders (TL) Curriculum Leaders (CL) Experienced Teachers (ET), Early Career Teachers (ECT), Implementation Officers (I.O), Aboriginal Women Leaders (AWL).

Individual quotes from the interviews are identified according to the role of the person interviewed (ie School Leader number 2 interview becomes SL2) and quotes are identified based on a number assigned to the interview in a particular school For example Senior Leader (SL), number two interview (also transcript 2), from the researcher perspective is quoted as SL2. Quotes are identified in the transcript and presented in the thesis by line number (ie T306). So a quote by a Senior Leader, interview number two at a particular site, becomes (SL2, T306). Focus Group Discussions (FGD) are identified by transcript number only.

The chapter summaries following provide an overview of the case study chapters. The study makes particular reference to three Key Case Study chapters; chapter 4, 5 and 6. They are referred to in this way because these particular case study sites have made considerable effort for up to, two decades to build teacher capacity to design Integrated Programs collaboratively. The two other case study chapters (Chapter 3 and 7) provide insights about how Implementation Officers interpret their Australian Curriculum (AC) reform implementation role that included, according to Gilberts implementation flagship program, 'collaborative professional learning' (2011, p.7) and attention to interdisciplinary knowledge perspectives. Gilbert states the Australian Curriculum

> is subject to ongoing monitoring and review in discipline and cross-discipline areas and that curriculum change is not a process limited to a particular period of time but an ongoing and necessary part of the routine practice of schools (Gilbert, 2011, p.2)

Chapter 7 focuses also on system-wide efforts to implement integrated synthesis of STEM subjects and associated structural changes.

**Chapter 3: Implementation Officers' reflections about 'professional collaboration' and the implementation of the Australian curriculum (2012-2016)**

Secondary teachers in this State have been involved in ten continuous years of state and national curriculum reform including the implementation of a new senior secondary certificate education (SACE), 2008-2012, and of the Australian Curriculum (2012-2016). Implementation Officers for the Australian Curriculum were interviewed about their role in supporting schools to adopt collaborative, knowledge sharing arrangements and about practices observed about teachers collaborating to design learning. In terms of stakeholder responsibility for professional collaboration it is evident that if 'collaboration' is not clearly defined, professionally, the responsibility for reform, is more likely to be redirected to those with less power. This study argues therefore that a focus on the teacher professionalism 'teacher knowledge, collective autonomy and the capacity to collaborate' could provide some of the solutions to collaborative reform issues in schools (OECD, Teacher Professionalism Index, 2016).

**Chapter 4: A Case Study of 'teacher time for interdisciplinary thinking and planning'**

'Time for interdisciplinary thinking' is the vision and the charter for this school. This vision is recognised as important because it specifically shapes the process of designing learning in an interdisciplinary collaborative design context where teachers work autonomously and are collectively responsible for the creation and maintenance of Integrated Programs of learning. The vision also ensures that there is a shared language.

This school is committed to teacher led 'curriculum reform through the development of 'interdisciplinary teams' and working collaboratively on the entire problem through the lens of teacher expertise. The school expressly:



> *values the decisions that teachers make about teaching and learning by giving teachers the power and the time to make these decisions* (SL1, T562).

**Chapter 5: Student well-being and a strong relationships-based approach to designing, teaching and learning**

Student well-being and a strong relationships-based approach to designing, teaching and learning using integrated approaches is strongly supported at this site. Teachers design learning together within well-established well-being frameworks and are clear that 'it's the well-being of students' that comes first; it is the foundation for the school's interdisciplinary approach and the subsequent integrated learning packages created. The fact that two of the programs can now be accessed more widely by other schools validates the well-being vision at the school and consolidates teacher resolve to continue to create interdisciplinary learning opportunities for and with their senior secondary students. The school's collaborative design practice has been sustained successfully for nearly two decades.

**Chapter 6: A case study of a 'moral imperative': *To do something about 'student engagement'***

Compelling data sets convinced the site leadership team and teachers at this school to embrace an integrated curriculum vision to engage students in learning in a secondary context. Subsequently, self-identified staff worked out ways to collaborate professionally, to imagine and realise significant structural change, as well as *'less insular attitudes' to planning, teaching and learning'* through the *'synthesis of curriculum content'* across the disciplines. This case study site is working at the interface of planning and teaching with the 'Big Picture' network of schools including extensive professional collaboration opportunities that challenge teachers traditionally held beliefs about planning, teaching and learning.

**Chapter 7: A Case study of teachers' designing integrated 'STEM' programs** (Integrated science, technology, engineering, mathematics programs) in secondary contexts Teachers' designing integrated 'STEM' programs collaboratively is an important inclusion in research about teachers designing learning together. Interdisciplinary thinking, integrative synthesis and structural change is an agreed strategy for the development of STEM teaching and learning in South Australian

schools and internationally. Synthesis of knowledge across subjects is understood in STEM contexts as best achieved collaboratively and therefore enabling teacher collaboration is a critical consideration in progressing this State's STEM strategy, that is proving challenging to progress.

**Chapter 8: An holistic analysis of the data.**

As part of a process to reflect on and analyse data to reveal links to the key questions to be answered in chapter 9, this chapter is presented in eight sections; together they summarise the study's findings. Each section is designed as a stand-alone contribution for professional discussion at a school or in policy settings. Data from each of the case study sites is integrated to provide an holistic analysis about the creation of Integrated Programs. Additional sources of data, other than sources identified in each of the key case study chapters, are also included in this chapter's analysis. These include data from the Aboriginal women's workshops, official SACE data about the subject 'Integrated Studies' in the absence of data about the 'Integrated Program', a detailed description of an integrated planning process from one of the case study schools and an analysis of teacher dispositions, motivations and school culture factors impacting on teacher future engagement in collaborative design practices,

**Chapter 9: The importance of Collaborative Planning**

The chapter reflects on personal professional experiences over time and the importance of collaborative work in defining teacher identity. It includes reference to key researchers that guide the research such as Salonen et al, (2015) who describe some of the most important elements of a teacher's work as 'co-operation when constructing, de-constructing, and re-constructing knowledge; planning together; team teaching'. The chapter reiterates the key questions and makes reference to the questions in relation to the eight Sections of analysis in chapter 8. The questions are responded to under the key issues identified including 'building teacher capacity', 'working within and against SACE policy', 'teacher as creator of knowledge', 'metaphors to describe collaborative design practice' and 'Aboriginal planning standpoints in mainstream schooling.



# CHAPTER 3

## CASE STUDY 1: IMPLEMENTATION OFFICERS' REFLECTIONS ABOUT PROFESSIONAL COLLABORATION AND THE IMPLEMENTATION OF THE AUSTRALIAN CURRICULUM (2012-2016)

### INTRODUCTION

A literature review for schools to prepare lead teachers to mount a successful Australian Curriculum professional learning program included a focus on leadership capacity for leading curriculum change and teacher capacity to collaborate (Gilbert, 2011), yet few schools are organised so that teachers can collaborate routinely. So, despite research consistently validating the benefits of collaborative practice, making time, space, structural changes and organisational elements available so teachers can collaborate is easily ignored in schooling contexts. There are exceptions, including in the case study sites where site leaders are actively working out ways to make time and space for teachers to routinely design learning together.

Secondary teachers in this State have been involved in a decade or more of continuous state and national curriculum reform. For the duration of the implementation of both the SACE and the transition to the Australian Curriculum, support was provided by a secondary team of Implementation Officers, assigned to work across allocated districts and in schools with leadership teams.

The job and person specification for a Curriculum Implementation Officers for the Australian Curriculum was described as a 'state-wide leading role working directly with school leadership in schools to provide support, (professional learning programs and materials, clarity and advice) about the implementation of Australian Curriculum and how schools might design the familiarisation and implementation phases of the Australian Curriculum (SA Government, DECD, 2011). Retrospectively, the emphasis was about organisational and structural design as well as curriculum

design and Implementation Officers working with leadership teams including teacher leaders to achieve these outcomes. This case study explores Implementation Officers' understandings about their role, as it relates to teachers collaborating and collaborative design resolutions observed in schools at the time (2012-2016).

The Australian Curriculum, Assessment and Reporting Authority (ACARA) provided the 'Professional Learning Flagship Program' to support a consistent implementation approach that identified the following capacity-building solutions to progress the implementation of the first Australia-wide curriculum. It included professional learning for leading curriculum change to

> enable participants to identify key factors influencing curriculum change in their professional contexts and strategies for addressing them including such factors as clarifying goals, promoting organisational structures and management processes, engaging school teams, cultures, and beliefs, building collective capacity through learning, reflection trust and collegiality (Gilbert, 2011, p. 34)

These are big picture recommendations and the use of terms such as 'collective capacity', 'sharing, collaboration and cooperation', 'trust and collegiality', 'professional learning communities' and the capacity to 'struggle for what teachers believe' reflect this intent, particularly 'the struggle for what teachers believe'. Implementation Officers, including myself, however, focused mainly on the provision of a familiarisation and implementation phase in each school that included the key elements and mechanics of the AC and the intricacies of planning and assessment in a 'standards based curriculum' in particular.

Implementation Officers for the Australian Curriculum were interviewed for this study about their roles in supporting schools to plan and implement a five-year curriculum reform strategy. This included questions related specifically to professional learning opportunities for teachers such as collaborative knowledge sharing arrangements, or teachers collaborating to design learning or teachers engaging in synthesising curriculum content together to progress teacher learning including interdisciplinary knowledge and curriculum options. The interview sought any strategy with a focus on building teacher professionalism; teacher knowledge, collective autonomy or teacher capacity to collaborate.



This chapter provides background information to a study that argues that a focus on 'collaborative design' resolutions helps progress teacher professionalism; teacher knowledge, collective autonomy and the capacity to collaborate and influence schooling as identified in the OECD Professional Teacher Index (2016; see Appendix #1).

## STATE INITIATIVES THAT SUPPORTED THE IMPLEMENTATION OF THE AUSTRALIAN CURRICULUM

Implementation Officers were supported in their roles by three key state-wide initiatives that complemented curriculum policy reform efforts. In South Australia, there are three education sectors - Public, Private and Catholic Education – with responsibility to lead the development and implementation of innovative practices in teaching and learning, community interaction and school organisation. This research took place in the Public sector where three initiatives provided guiding support and tools for the implementation of the Australian Curriculum (AC). They included the 'Teaching for Effective Learning Framework' (TfEL Framework), a resource for guiding quality teaching and learning in South Australia; a 'Learning Design Tool' to support curriculum planning during the implementation of the AC and a Discussion Paper by the South Australian Secondary Principals Association (SASPA) about the need for clarity in existing policy about 21st century learning and teaching paradigms (SASPA, Discussion Paper, 2014).

SASPA members described fundamental principles that they believe embody 21st century learning and teaching paradigms consistent with the South Australian Teaching for Effective Learning (TfEL) framework. These principles include learning '*that is designed to be learning for life', 'learning designed to be relevant and meaningful', 'learning designed to be personalised and accessible 24/7' and 'learning designed to be collaborative'.* To complement these learning principles, four 'teaching principles' were developed. All principles reflect the central role teachers play in the 'organisation and creating of learning'. The principle, *'teachers needing to be collaborative learners' and re-focusing the way time is used in classrooms',* is the most relevant to this study. The teaching principles imply a focus on teachers as professionals with the knowledge and autonomy to innovate, collaborate and create. Collaborative design practice is a strategy that may support schools to achieve them.

The South Australian 'Teaching for Effective Learning Framework' Guide (TfEL), published in 2010, prior to the implementation of the Australian Curriculum (AC) in 2012-2016, and 'the Learning Design Tool' were both used to facilitate AC planning and provide guidance to support quality teaching and learning in this State.

Reference to 'collaboration' in the TfEL document includes the identification of dialogue and collaboration to enable co-construction of learning and there is also acknowledgment that knowledge construction is best accomplished through collaboration and deliberate and thoughtful design, planning, organisation and evaluation. Valuing students' prior knowledge and seeking out what students already know, can do and understand, to inform planning is also understood as fundamental to the planning learning process.

TfEL encourages school leadership teams to structure timetables to allow staff collaborative planning time to develop skills for designing, planning and organising learning and teaching and acknowledges the importance of 'deep pedagogical and disciplinary knowledge to design learning for understanding'. The concept of 'interdisciplinary knowledge', however, is conspicuous by its absence. TfEL encourages Leadership teams in schools to 'critically evaluate the effectiveness of systems and structures for maximizing learning' (for students). The effectiveness of systems and structures that support the learning of teachers (2010, TfEL, DECD, p.26) to 'work collaboratively to design and plan teaching programs that are responsive to student needs and curriculum standards' (2010, TfEL, DECD, p.27) also needs consideration.

In terms of promoting teacher professionalism TfEL identifies the importance of teacher knowledge but there is limited reference to teacher autonomy and strategies to facilitate collaborative practice other than *'dialogue' and 'planning time'*. Advice for teachers to collaborate to achieve outcomes is forthcoming but policy about how this can be achieved in schools, for example via collaborative planning is less visible. Similarly, policy linked to achieving the various domains of teacher professionalism, other than accountability mechanisms, like the Australian Teacher Standards, are generally understood as excessive to requirements.



The 'Learning Design tool' is the third element supporting Implementation Officers which engages teachers in re-thinking the relevance of what is taught and why. Fadel and Bialik suggest a major update to our knowledge goals that includes

> modern interdisciplinary subjects, branches, and topics, focused on essential concepts, meta-concepts, methods, tools with cross cutting themes … included in students' education to equip them with knowledge necessary for the twenty first century (Fadel, Bialik, Trilling, 2015, p. 54).

When Principals talk about the need for 'clarity in existing policy about 21st century learning and teaching paradigms' (SASPA Discussion Paper, 2014) what they are referring to are policy demands that use language and concepts that are ambiguous. Principals are asking for detailed explanations of key concepts that describe teacher practice and professionalism and how to achieve it. The three domains of teacher professionalism, teacher knowledge, autonomy and collaboration, could be used as a framework, to adapt at the site level to achieve professionalism objectives.

The three complementary statewide initiatives provided a foundation for the implementation of the Australian Curriculum. The TfEL framework has been well supported but it does not make explicit its broad acceptance to promote teacher professionalism. Implementation Officers, however, used these resources to guide a relatively consistent approach to AC reforms in this State.

This study aims to complement the TfEL Framework by providing details about the practice of designing learning collaboratively. Gilbert's (2011) literature review is used to construct the key discussion questions conducted with Implementation Officers for this study. In his literature review, Gilbert clearly states:

> The Australian Curriculum is not restricted to learning from the Disciplines and it also recognises that 21st century learning does not fit neatly into a curriculum solely organised by learning areas or subjects that reflect that disciplines. Consequently, the approach to knowledge required of curriculum leaders (and teachers) goes beyond the disciplinary perspective, which is likely to be a major challenge in a curriculum traditionally dominated by disciplinary structures (Gilbert, 2011, p.29).

## INTERVIEWS WITH AUSTRALIAN CURRICULUM IMPLEMENTATION OFFICERS

Interviews with Australian Curriculum (AC) Implementation Officers are about their observations in schools about teacher collaboration, including the prevalence of

teachers collaborating to design learning. Five interviews with Implementation Officers as well as a group discussion with eleven Implementation Officers form the basis of the data collected. The discussion prior to the interviews for this study provided common reference points for Implementation Officers to reflect on and elicit their perceptions, opinions, beliefs and attitudes about 'professional collaboration' as part of the implementation of the AC.

Fourteen Implementation Officers were initially employed to work in secondary contexts with leadership teams across 162 sites including, High Schools (64); combined primary and secondary schools (14); special schools (18); Area schools (47) and Aboriginal Anangu schools (17).

The interviews included questions about interdisciplinarity, collaboration and professional practice and examples of collaborative design practices observed (2012-2016). The Implementation Officers are former colleagues of the researcher and, when interviewed, time was taken to share experiences about common understandings about key work roles and responsibilities such as working directly with Principals and leadership teams in schools and being cognisant of Gilbert's Flagship professional learning program, particularly as it related to the role of Implementation Officers in *'building collective capacity'*.

**Collaboration and the Professional Learning Flagship Program**

Implementation Officers were asked to consider various elements of 'The Professional Learning Flagship Program' **(**Gilbert, 2011), about what they had observed in schools involving teachers collaborating to design curriculum and their perceptions about 'professional collaboration' in implementing the AC. Implementation Officers' responses to the prevalence of professional collaboration suggested the focus on teacher collaboration to implement the AC was minimal in schools. An Implementation Officer commented *'teaching in most schools is still the teacher goes in, they shut the door and it's a pretty individual profession at the point of delivery'* (I.O. 1, T187) and *'teachers initially resist change, it's like a grieving process, and eventually they come to some sort of conclusion that, I can work with this, I feel confident with this, I can cooperate with this'* (I.O. 2, T1409). Another Implementation Officer suggested **'***you cannot persuade teachers about*



*collaboration, they have assumptions about it, they think they do it anyway; they think they collaborate, so how do you go out there and collaborate? It's like, we do it anyway*' (I.O.3, T290). This raises issues about teacher understandings about capacity to collaborate and teacher understanding of key concepts associated with professionalism.

Implementation Officers were comfortable with helping schools become familiar with the new curriculum but accepted that curriculum reform implementation was ultimately the responsibility of leadership and practising teachers in schools. The reality is *'teachers have to play in a space to try to balance a lot of balls, and sometimes the balls that they're balancing are less important to learning, but more important to the administration and the effective running of the school'* (I.O 1, 430). Advocating for professional collaboration and teacher professionalism as part of a key reform strategy perhaps requires a concerted effort systemically. This statement alludes to the complexity of competing priorities associated with collaboration and teacher professionalism. Generally Implementation Officers statements about collaboration were described in terms of teacher practice rather than as a reflection of their own practice.

Responsibilities for professional collaboration are rarely clearly defined – Teachers are rarely asked about collaborative structures and processes to support their learning; knowledge, autonomy or capacity to collaborate. The responsibility for reform is more likely to be redirected to those with less power. When the entire school community has an ongoing commitment to professional collaboration, as in the case study schools, rather than being directed from the sidelines, hierarchies of knowledge and hierarchies of practice are less likely. Implementation Officers were very positive, for example, about teacher reactions to specific task design workshops, resourced centrally, that were successfully implemented across school districts where teachers worked collaboratively and received a consistent message to guide future planning in schools. More often than not however, teachers continued to design individually rather than seek more collaborative design solutions when they returned to their schools. The key element was that they 'collaborated' which is why they were very positive about the experience but this practice was not replicated when teachers returned to schools. Acknowledgement of collaborative practice is

rarely highlighted in professional learning situations, but it needs to be, and teachers need to be part of the solution to make it more visible and central to teacher practice.

**Collaboration and the new Australian Curriculum**

Implementation Officers were asked about the new Australian Curriculum (AC) and any significant shift in relation to collaboration amongst teachers, site leaders, students and parents. As quoted earlier, the Australian Curriculum is described as a three-dimensional curriculum that recognises the central importance of disciplinary knowledge, skills and understanding; general capabilities and cross-curriculum priorities (ACARA: Australian Curriculum, Assessment and Reporting Authority). Implementation Officers made particular reference, to the 'Capabilities' as the most likely source to generate collective decision making and teacher confidence in their abilities to use the Australian Curriculum as a *'suggestive planning tool rather than an obligatory tool'*. The 'Capabilities' (literacy, numeracy, ICT, critical and creative thinking, personal and social capability, ethical understanding and intercultural understanding) demand that learning tasks are inclusive of planning practices. They provide a common language across subjects and amongst teachers for collective understandings and future actions. The Capabilities could be a part of what Sennett (2012) describes as the '*daily rituals that bind people in their everyday lives'.* Implementation Officers suggested the Capabilities could possibly evolve and serve as opportunities and structural mechanisms for future reforms.

> *A boxed curriculum doesn't require real reform. Leaders will try and manage getting it in place and doing the right thing, being compliant.' 'I think that more and more people are starting to realise the General Capabilities are the real drivers of both teaching (planning) and learning reform* (I.O.3, T158)
>
> *The Australian Curriculum came as boxed-up disciplines that reinforced a structured and ordered curriculum that we probably were trying to get away from. It's only when people say, I know my curriculum really well, and I know the skills, and I also know how to connect learning across the disciplines* (I.O. 1, 130 – 160).
>
> *Any innovation involves problem solving and problematising takes a lot of time, and there's that tension in secondary where teachers are constantly torn between knowing what they'd like to be doing but constrained by the amount of stuff they have to cover and so it's harder work for a lot of them. It involves more thinking and risk taking* (I.O. 3, 133).

There was a general sense that teachers needed more time to reflect on the possibilities of the new curriculum before they could feel confident to take risks



necessary to collaborate and innovate. Professional collaboration solutions to address tensions teachers experience in curriculum reform contexts need to be a key reform consideration yet it is not something that those responsible for implementation reforms are likely to consider in the first instance. This study argues that unpacking the key aspects of teacher professionalism could reveal solutions to reform issues described.

In discussions about collaborative opportunities in teaching and as an outcome of the AC one of the IOs reflected on their previous role as a Drama teacher and said the part he liked about Drama

> *is that it is a collaborative space all of the time. It's about learning about yourself, and the fact that individuals can do things, the same things in different ways, and you need to be accepting of that diversity and of yourself to be different, and that's ok. So, for me the most powerful thing is to feel confident about communicating your ideas, confident enough with your own identity and be someone who's learnt how to collaborate and achieve something in a collective space, rather than achieving something in a space that is often hidden* (I.O 3, 793) *and is artificial* (Case study 2, TL3, 68).

Building on 'drama teacher expertise' and understandings with teachers in planning learning spaces would be a useful consideration in reform contexts.

**Additional drivers of professional collaboration in curriculum reform contexts**

Additional drivers of professional collaboration in curriculum reform contexts include standards-based moderation and assessment practices that use collaborative strategies that encourage teachers to engage in dialogue about the 'standards' and where teachers are expected to reach agreed understandings about 'the standard' of student work, according to A-E descriptors of the standards for each subject.

Implementation Officers also talked about trying to 'get groups of people to sit down and discuss' what they were doing in relation to planning and moderation.

> *The space the I.O.s are playing in now is less to do with this or that presentation about the AC. Now groups of teachers are getting together reflecting on work samples and the standards, … and trying to get consistency, and that's having an impact on practice in terms of what they do in the classroom* (I.O.3, T612-619).

Moderation practices support planning learning practices but at this stage there is limited support to build teacher-planning capacity specifically.

Partnership arrangements in schools and across schools and with the community were included as a driver of greater collaboration, for example, *"Middle Schooling arrangements and attitudes that continue to encourage reflection and collaboration"* and more collective ways of being a teacher. However, it was expressed that many of these partnership arrangements *are "dependent on good people willing to commit to that sort of relationship, and that's about trust"* (I.O.3, T826).

The 'Teaching for Effective Learning' (TfEL) framework was understood by Implementation Officers as a driver of collaborative practices in schools, including 'learning by design' practices. *TfEL has certainly been one of the things that I think the implementation has been about* (I.O. 1, 417).

For example, teachers used 'learning by design' approaches in secondary teaching contexts in the Anangu Pitjanjatjara and Yankunytjatjara (APY) Lands. Teachers across these schools agreed that when planning learning, they needed to think about knowledge to help families and communities. Teachers agreed to ask themselves three questions 'when new knowledge comes from outside'. Yunkaporta talks about 'loosing your identity in knowledge that comes from outside' (2009, p.34). Teachers, including Aboriginal teachers and support staff decided to design with reference to *'What does this learning mean for students and their families?, what learning do we have here that is the same and what is different? and how can students use this new knowledge and skills to help their families and communities?'* These decisions and arrangements are made and adapted locally and are critical in building a common narrative between teachers and between teachers and their communities so communication and collaboration is more likely.

'I'll give it a go' attitude to reform was also considered important.

> *If I had to give an overall reaction from most of the leaders, and also most of the I.Os, we are all pleased about limited resistance to reform and the openness to give it a go. I'll organise it; I'll spend some time on it. I think there's an appreciation that there's been time given to them, even though it might not be enough, there's been support given to them in terms of support from Implementation Officers. The implementation has been heavily focused on getting 'the what' (of curriculum) underneath their belt; the how is now increasingly becoming more prominent* (I.O. 1, 475).



**Examples of collaborative design curriculum work observed by Implementation Officers**

Implementation Officers shared stories about collaborative curriculum work observed or had been involved in facilitating. The following three stories are about technology inspired collaboration and 'subject integration' and collaboration motivated by a key idea of interest inspired by the AC 'cross curriculum priorities'.

Technology driven collaboration across schools

> *A Phys Ed. teacher using iPads and video-recording to create electronic portfolios is creating assessment tasks that are supportive of the Phys Ed learning area and have sufficient rigour and complexity to meet the Australian Curriculum Standards. This teacher is collaborating with a specialist volleyball school, interested in using technology to support student learning in the specialised area of sports coaching. It's about recognising what is valued across subjects and how technology can support that collaboration* (I.O. 3, 452).
>
> *I'm hoping the dialogue will enable them to reflect on what they're doing and recognise that by collaborating and respecting both the specialist sports knowledge and the pedagogical and technological knowledge that each of them bring to the table, they can cross-fertilise a bit and come up with really meaningful stuff* (I.O. 3, 488).

Collaboration via subject Integration

> *This is a site that is integrating History/Maths/Science …. they chose to do it that way because they knew the structure, the content linking them, and they all had interest in the Kokoda story. For maths they did trig linear equations; the science people did Energy Systems and Reflection, dehydration, gravity and expending energy downhill or uphill with a backpack …. that sort of stuff. The history people looked at the film Kokoda and focused on building 'critical and creative thinking' and 'ethical capabilities' to highlight the importance of 'seeking truth' in their own research. The learning culminated in planning a walk of the Kokoda Trail. So, the first three weeks there are three key tasks for maths. For science there's four tasks and then two tasks for History to meet the standards in each of the three subjects being integrated. In the last week, there were 15 lessons to complete the program and there was no particular class time for maths, science or history. It was inter-changeable according to student interest and ensuring they meet the standards of each subject. They've gotten used to the AC, and they're confident with it and they wanted to trial it, and they wanted to do it together. The fact is, they'd had three years' experience of the Australian Curriculum, so they knew the structure of it; they knew the standards and so they had the confidence to integrate it* (I.O. 2, T, 223 – 238)

Cross Curriculum priorities and collaboration

> *Another site is integrating 'Health and PE', Technology and the Arts. They call it global studies; an Integrated Program across Humanities and English in year 8 and 9, which is highlighting the cross-curriculum priorities (Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia's engagement with Asia and Sustainability as part of inquiry based learning approaches, and it is led by the* Principal (I.O.3, T672).

These examples highlight integrated design work in junior secondary contexts. The examples provide an insight about teacher interest in interdisciplinary knowledge perspectives and highlight the interdisciplinary and collaborative capacity of teachers in schooling more generally, which provides confidence for interdisciplinary and more collaborative practices moving forward.

## SUMMARY

In the key case study sites, Implementation Officers observed the drivers of collaboration, including TfEL and the Capabilities in the A.C. are challenging existing planning, teaching and learning practices. The 'drivers of collaboration' identified by the I.Os have been generated and shaped at the school level and are examples of actions that remind us that schools are not just reliant on centralised systems and that schools can shift emphasis towards improving the practice of teaching itself. An Implementation Officer stated however, *'unless the system drives this more and gives licence for people to do innovative practice for 21st century learning, it's probably going to just dawdle along in little pockets*' (I.O.1, T75).

Answers provided by the I.O.s suggest that it is important for teachers to share knowledge and have opportunities to collaborate as part of reform efforts but the links between Implementation Officers perceptions about their role in relation to building capacity to collaborate was tenuous at best. There was also limited evidence about specific examples of school leadership mobilising teacher collective capacity. Elmore suggests 'leadership is both a marker for capacity and a factor in determining an organisation's ability to mobilise and use capacity in its environment' (2006, p7).



Gilberts extensive literature review, prepared specifically for the implementation of the Australian Curriculum may have been on reading lists for I.O.s but recalling professional discourses about teacher collaboration as part of reform efforts was rarely referred to in interviews with I.O.s despite teacher collaboration being supported widely by evidence that leads to 'a wide range of teacher and student outcomes in schools' (ACARA, Gilbert, 2011).

Implementation Officers agreed that Phase One of the implementation process about teachers becoming familiar with the structure of the Australian Curriculum required more time than expected for teachers to feel confident in terms of new concepts, processes, content and the transition to applying this learning in practice. Teachers were generally understood as very compliant and enthusiastic in wanting to get the Australian Curriculum right so time was an important consideration because teachers were in transition to a standards based curriculum and there was the added complexity in relation to both planning and assessment. To support teachers SACE Board Officers and Implementation Officers provided workshops for the duration of the implementation of the AC and observed that three years experience was needed for teachers to feel confident in their capacity to work with the AC; to know the structure of it, to know how to plan for and assess the standards. It is only 'after teachers have successfully worked with these requirements that Implementation Officers suggested teachers feel confidence to innovate and collaborate to integrate subject content' (I.O. 2, T, 223 – 238).

This study can only imagine more collaborative and connected outcomes if the implementation focus had been more directly about working with school leadership to mobilise teacher collective capacity rather than, as was often the case, I.Os working with smaller groups and teams in schools to mobilise the schools teachers. This approach ultimately demanded that individual teachers learn to know, practice, plan and assess the Australian Curriculum as individuals rather than collectively.

Was this a case of school leadership stepping back from providing the vision and the culture moving forward because there were Implementation Officers to provide the message or was it the case that when the education community is provided with significant reform agendas we ignore the evidence, in this instance, about collaboration, because we assume teachers will do it anyway and because we don't

have time for teachers to collaborate or structures and processes in place or confidence in our teachers to work together to resolve reform issues, collectively? As an Implementation Officer for the Australian Curriculum I feel the reforms around 'collaboration' may have been an opportunity missed given the evidence available from ACARA (Gilbert, 2011) at the time.

Planning with leadership in schools was a priority outlined in the job and person specifications, but inevitably, if leadership did not make themselves available the message given, focused on what teachers needed to understand, be and do to survive in the classroom with the AC rather than leadership taking a bigger picture perspective about teacher capacity (to collaborate), and teacher leadership at the site level.

In retrospect enabling leaders and teachers to identify key factors influencing curriculum change and teachers suggesting strategies to address them by clarifying site and individual goals may have been a better way forward. Promoting school teams and organisational structures and management structures so teachers can be mobilised to collaborate in the first place, may also have been a better course of action. A focus too on collaborative design, as is evident in this study, to build collective capacity through learning and reflection, and trust and collegiality could have contributed to whole school reform outcomes as well (Gilbert, 2011, p. 34).

What was achieved is significant curriculum reform and Implementation Officers all shared examples of collaborative knowledge sharing arrangements in schools and examples too of individual teachers planning and implementing integrated curriculum. Teacher feedback about support provided suggests they were satisfied with the four years provided to familiarize themselves and action the details of the AC. It is important also to reflect on what could have been achieved if the focus was more about the development of teacher capacity and a focus on anything preventing a group of teachers from collaborating effectively (Levin et al 2008, p295).

More research is needed to make visible the learning journey and collective efficacy journey of teachers, school leaders and those supporting reforms in contexts related to the implementation of the Australian curriculum. In the process to support teachers, people with power at a systems level sometimes forget that school-level



educators can learn best from one another's knowledge and practical experience and in the process find new ways of supporting professional practices as part of achieving curriculum reforms at the local level.

## SEGUE TO THE THREE KEY CASE STUDIES

In moving from the overall perspective of the Implementation Officers, the thesis now explores in detail three key case studies. In contrast to many schools in this state, these case study schools share three critical understandings. Firstly, they are confident in their knowledge about their students and curriculum frameworks and they know how to reconceptualise and apply subject frameworks for specific groups of students. They are confident in their collective capacity to design learning using interdisciplinary knowledge and design practices while also meeting compulsory requirements of the SACE and the AC. Secondly, they understand curriculum as a 'suggested' framework rather than one that is static and not open for re-conceptualisation. Thirdly, they are knowledgeable and enthusiastic about education reforms, locally and more broadly. It is important to note, for example, that in contrast to most schools, where 'teachers report relatively infrequent collaboration with colleagues within the school, beyond a mere exchange of information and ideas' (Schleicher, 2012, p.47), the case study sites have each developed or are developing structures and processes that enable teachers to collaborate and communicate routinely. The structures and processes are specific to each key case study site. They recognise the significance of prioritising the organisation of schooling so teachers can collaborate routinely, as part of core business as a means of identifying and resolving practice issues and in doing so, this study suggests, these sites are guaranteeing a way to progress teacher professionalism.

As discussed in Chapter 2, Table 3, themes emerged within and across the key case studies. The range of analyses strategies include a focus first on the identification of contradictions that define the ambiguities and the barriers to teacher practice experienced by teachers daily. In the case study schools contradictions are identifiable in situations where there appear to be competing demands for teacher time and expertise in relation to what needs to be done from a classroom and school perspective and what needs to be done from a system perspective. The complexity

of teacher work is often hidden in 'urgent performative arrangements and requests' that regularly impact on teacher practice. This study therefore identifies them to make them more visible so they can be addressed more formally.
Analysis of data across all sites also has a focus on the identification of teacher statements that reflect the transformation of teacher practice as an outcome of engagement in designing learning with others. To identify these sorts of statements the study reflects on research by Andreotti about 'shifts in educators epistemological understandings about knowledge, curriculum, teaching and learning' (2012, p.2). Analysis is based on teacher claims about changes in practice as a result of designing learning collaboratively. To identify changes in practice, the study reflects on research by Salonen et al) about 'teacher core capacity to collaborate effectively' (2015, p.8). Claims teachers make about the practice of collaboration itself and its impacts on practice are therefore identified in the presentation of the data.

Analysis also focuses on teacher claims about professionalism as discussed in the Methodology Chapter, p.65.) The analysis draws on research by Bourke about 'teachers' regimes of truth related to professionalism'. Analysis of teacher claims about professionalism aligns mainly with two of Bourke et al (regimes of truth) definitions namely, 'assertive resistance' and 'aspirational resistance'. They are particularly relevant in the analysis of teacher claims about professionalism because the key case study settings predominantly reflect, 'leadership' rather than 'performativity' cultures (2013, p. 5).

Teacher claims about teacher autonomy are aligned with Mausethagen et al (2015) two 'dimensions of professional autonomy' that includes the 'will and capacity to justify and develop core practices' and 'the will and capacity for self-governance'. The (OECD Professional Teacher Index, 2016), that includes 'Teacher Autonomy' is also used in the analysis of data for consistency across the case study sites.



# CHAPTER 4

## KEY CASE STUDY 2: TEACHER TIME FOR INTERDISCIPLINARY THINKING & PLANNING

### INTRODUCTION

This school's vision, *'time for interdisciplinary thinking',* promotes a shared language and common understandings that has resulted in the development of an agreed collaborative design process managed by autonomous teams of teachers. The school expressly *'values the decisions that teachers make about teaching and learning by giving teachers the power and the time to make these decisions*' (SL1, T562). *'Teachers have 'interdisciplinary thinking' in mind when they design learning collaboratively and that's a shared vision and a shared language'* (SL1, T23). Each design team at this school has responsibility for doing their own timetabling and employment of staff to complement curriculum objectives and school timetables.

*'All of that is left with the team, not with individuals, not with the leader, not with the SACE Coordinator, with the team to do that, and it's all around that innovation space*' (SL1, T323).

Teachers are also collectively responsible for the creation and maintenance of the eight highly creative STEM Integrated Programs of learning that are at the core of senior years teaching and learning at this site and it is the curriculum created by teams of teachers that has woven its magic on all concerned. The process of creating something worthwhile, together, that can be shared and shaped by those that follow for over a decade or more is significant and worthy of our attention.

### SCHOOL CONTEXT

This Case Study is situated in a public senior secondary school (Years 10-12) in South Australia and offers entry via application and interview to year 10 students

from across the state with an interest in STEM pathways (science, technology, engineering and mathematics). It was *'uniquely designed to support a renaissance in the teaching and learning of science and mathematics'* (Bissaker, 2014, p.56) and purpose built with technology-rich, interactive teaching spaces to promote excellence and innovation in STEM teaching and learning.

The curriculum called for what Tytler refers to as 'a significant 're- imagining' of science education as opposed to a mere refinement of curriculum and assessment (2007, p1). In research about this site Bissaker builds upon Tytlers vision and talks about re-imagining a generation of creative and complex thinkers ... and a significant focus on the role of the teacher and how to develop teachers' knowledge, pedagogical practices, and dispositions to re-engage students with the disciplines of science and mathematics' (2014, p.56).

Bissaker's comments strongly reflect researcher observations about the culture of this school that is focused on professional collaboration, *'interdisciplinary thinking and planning'*, with technology-driven resolutions as well as respect for teacher knowledge across the disciplines.

Interdisciplinary visions define everything the school stands for and interdisciplinarity is understood by staff 'as neither subject matter nor a body of content but a process for achieving an integrative synthesis….' (Klein,1990, p.188). Interdisciplinary thinking and structural changes are at the centre of this school's curriculum reform strategy; reform that has been 'endorsed by practising scientists and educators' (Bissaker, 2014, p.57).

A focus on the role of the teacher as well as organisational and structural changes that enable the capacity of teachers to collaborate is central in supporting the schools interdisciplinary thinking vision and engagement of students in STEM learning. For more than a decade interdisciplinary thinking and planning has been the vehicle of choice for the creation of diverse, Integrated Programs such as '*The Body in question', 'Communication systems', 'The Energy equation', 'Internet of Things', 'Medical Engineering', 'Sustainable Futures', 'Biodiversity', 'Dream, Design, Develop', 'Order from Chaos', 'Truth and Perception'*, all of which are core subjects at (Years 10-11).



At year twelve, the final year of schooling, students are required to choose from a list of disciplinary subjects as demanded by current SACE policy. Teachers have adapted to these requirements, but they also continue to advocate strongly for teacher involvement in interdisciplinarity curriculum thinking and planning in the final years of schooling. Equally significant, teacher leadership promotes the importance of professional collaboration practices which are deeply embedded in the culture and organisation of this school and integral to this schools' professional development (PD) and research brief, aimed at fostering innovation and reform in science and mathematics through STEM professional learning within and across schools. This is a significant school priority that identifies 'curriculum integration' and 'interdisciplinary thinking' to achieve STEM outcomes with both teachers and students as '*creative and complex thinkers'*. A focus on '*making time for interdisciplinary thinking'* also includes 'interdisciplinary planning' as part of a shared vision. Time for interdisciplinary thinking at this site is

> *the vision; the charter that we have as a school, why we think it's important, so that when teachers shape the work they're doing with their team, they have that in mind, and that's a shared vision and a shared language* (SL1, T23).

The vision is based on a 'community of thinking' vision to change practices from 'learning is listening; teaching is telling; knowledge is an object; and to be educated is to know valuable content' to a framework based on fertile questions, research and a concluding performance (Harpaz, 2005, p.136). The school's vision for teachers working in more interdisciplinary ways is reflected in the following statement

> Interdisciplinarity is a way of life. It quickly becomes a way of thinking, which opens fresh and deeply creative ways of engaging with the world. It builds collaborative bridges, enables the exploration of innovative pathways and marks a general willingness to interact and respond at all levels of living and thinking with an attitude of inquisitive, encouraging and supportive openness (Global Network, n. p).

A 'contributive' leadership model with a focus on *'active collaboration and the cultivation of trust'* (Sahlberg, 2011, p.2) complements such a vision.

> *We've set up different groups and every group has input into the decisions that are made around teaching and learning in an innovative space. These groups are responsible for*

*designing learning across the disciplines according to an agreed process* (Leader 1, T331).

A contributive leadership model came about as a result of internal school research that revealed that teachers at the school were continuing to perceive themselves as operating within a system of traditional hierarchies despite high levels of productive teamwork. Consequently, a more relevant model evolved based on Beare's (2006)

> ideas about moving away from the school as a machine-like organisation, to 21st century 'imaginary' that envisages the school as a living system: a network of relationships, rather than lines of authority and power (Hyde, 2015, p.13).

This living system metaphor mirrors an OECD Report about developing school leaders that recommends the development of 'educational ecosystems that support the creation, accumulation and diffusion of professional knowledge so teachers can improve and learn from each other's accumulative knowledge' (Schleicher, 2012, p.45). The report implies the need for a re-consideration of how knowledge is generated and applied within education and this aligns with the schools' vision and STEM innovation mandate.

Leadership teams at this site promote 'leadership rather than performativity' (Bourke et al., 2013, p.5). The school is committed to *'teacher led curriculum leadership' through 'interdisciplinary design teams'* and *'working with consensus using a shared lens'*. The school values

> *decisions that teachers make about teaching and learning by giving teachers the power and the time to make these decisions* (SL1, T562).

The school's vision also aligns with Klein's standpoint that 'interdisciplinarity has become central to teacher knowledge acquisition and planning and must not be peripheral to teacher training at all points of the career life cycle'. He suggests 'dual capacity is needed, based on understanding of interdisciplinary contexts, definitions, curriculum design, pedagogy, and learning processes' (2006, p.16). This study agrees and suggests a 'contributive leadership' model delivers 'dual capacity'. An early career teacher explained that:

> *the disciplines exist for a reason and they have their ways of doing and thinking'* (ECT, T,762*). ….. It's just* [interdisciplinary approaches *offer more, different ways of thinking about the same kinds of problems* (ECT, T, 767).



At this school the use of interdisciplinary design approaches is complemented by inquiry-based approaches that include:

> a process of answering a question, solving a problem or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession [and] draws on disciplinary perspectives and integrates these insights, through construction of a more comprehensive (learning) perspective (Klein and Newell,1998, p.7).

The complexity of diverse knowledge perspectives and the need to engage in curriculum design resolutions is difficult for teachers to ignore in twenty first century (C21st) planning learning contexts. The 'contributive' leadership model at this site supports capacity building and the provision of structures to support teachers to plan collaboratively as members of teaching teams. 'Capacity building' at this site reflects Fullen's definition about capacity building as 'any strategy that results in teacher capacity to collaborate', and a 'contributive' leadership model, complements and helpa to build autonomous teams of teachers with the responsibility for designing learning. Each team at this school has responsibility for doing their own timetabling as well as employment of staff to complement curriculum objectives and school timetables.

> *All of that is left with the team, not with individuals, not with the leader, not with the SACE Coordinator, with the team to do that, and it's all around that innovation space (Leader 1, T323).*

This school is also a part of the 'Learning Environment Applied Research Network', (LEARN) and engages with many dimensions of learning.

> *Space is at the centre of what we do here. It offers so many opportunities for us that we really haven't even begun to realise what those opportunities are yet, and we've been here for 15 years now* (SL1,T427).

> *Leadership gives you opportunities; they tell you about some of these ideas, and then we do the rest ourselves, so we get excited about these things …. To actually make a big change like this, it requires great leadership; people who are quite visionary … who are able to accept some disasters. .... I think this requires a big re-thinking, and it requires enough teachers to be on board, to want to do something exciting* (ET3, T866).

**Leadership roles and team structures that support collaborative design practices**

The structures in place reflect an ongoing, collaborative, cross-generational approach that is grounded in respect for the knowledge and skills of others. As new knowledge arises, teachers seem to be able to put aside knowledge biases and contribute, contest and collectively determine content and pedagogical approaches. The eight core programs offered at the school for (Years 10-11) students are reviewed regularly and are constantly evolving, as new knowledge, issues and new teachers reflect on other possibilities of relevance.

> *Designing learning collaboratively is rewarding, ……. it respects the status of education as something important, and that it is some kind of professional pursuit to be doing these things which are more complex than just, well here's your subject; your sequence, go and teach. So, I think it's a really important part of our ...professionalism* (ECT3, T450).

This school places a high priority on staffing roles and creating and maintaining strong professional learning communities. All teaching staff are involved in working collaboratively to plan, teach, develop and review curriculum, and consequently there is a high priority given to staff support systems so teachers are positioned to work in collaborative ways. Evolving leadership roles contribute to the development of an interdisciplinary thinking and learning culture. Roles such as *Director* and *Assistant Director of 'Professional Learning'*, for example, have a focus on building the professional capacity of teachers to create learning environments; it is described as a role *"about teacher work, rather than curriculum structures, and about the logistics around getting teachers together"* (SL1, T13).

> *Finding time for people to sit around the table together is quite problematic. We timetable that in to our schedule, and we also allow time within teachers' workloads for one of those meetings to occur a week. This is a part of teacher work and therefore there's the expectation that teachers will be involved (in curriculum planning and review) and that they won't miss a meeting* (SL1, T23).

The Director of 'Pedagogical Innovation' has a focus on innovative pedagogies and learning design in STEM work with teachers to embed and disseminate innovative practices more deeply within programs. There is also a Coordinator of 'Interdisciplinary Curriculum' to help build teacher skills and confidence in using interdisciplinary curriculum and a Coordinator for 'Girls in STEM' that has a focus on



creating an engaging learning environment that promotes equity for engagement of girls in STEM.

The school has also introduced the role of *'Coordinators in Digital Literacies',* which has led to the integration of online learning management systems and innovative software across the curriculum for teaching, learning and assessment. Digital literacies coordinators at the site provide relevant timely support for teachers working collaboratively in an emerging interdisciplinary design context. The expectation is that all programs of learning need to adapt to new digital literacies, digital tools and related pedagogies and to new knowledge. 'Edutech', an online application where teachers design and receive feedback from colleagues simultaneously, is promoted widely. In relation to designing and re-designing programs of learning, an early career teacher stated *'It's impossible not to change it; that's just like, why do we innovate, why do we change things? Just can't help it'* (ECT1, T1140).

With an increasing focus on students co-constructing learning as well, staff are very cognisant of the shift in education provision and the use of high quality 'moocs' (Massive Open Online Courses) *'that kids can tap into anywhere on the planet that meet their particular interests and needs. Students here can opt out of the mainstream stuff; they can choose to do that'* (SL2, T880).

All teachers are members of teaching teams supported by designated team leaders and there is time set aside within the timetable for all staff members to participate in 'interdisciplinary thinking' each week. The distinction between professional collaboration and professional development is significant and the paradigms of each are understood clearly by teaching staff. All staff, for example, are part of professional development teams that include a *'Leadership Steering House'* with a focus on coordination and interdependencies and an 'Action Research Group' to support teachers to reflect deeply on practice.

To support 'collaborative design' work; there is also a specific 'Teaching and Learning Team' led by Coordinators of 'Interdisciplinary curriculum' and a 'Co-Design Curriculum and Personalisation of Learning Team' that includes assessment and pedagogical design innovation to assist the development and implementation of curriculum.

## ANALYSIS OVERVIEW: CASE STUDY 2

The nine teachers interviewed at this site include two Senior Leaders (SL) in management positions who provided key data about the history and key aims of their school as well as 'contradictions' experienced in an interdisciplinary collaborative design context. The six teachers interviewed included one Teacher Leader (TL) and two experienced teachers (ET) who provided longer-term perspectives about a school culture defined by a 'contributive' leadership model and an interdisciplinary thinking' vision. The other four teachers were 'early career teachers' (ECT) with less than three year's experience who were part of a 'South Australian Workforce Strategy (Teach SA) to encourage science professionals to consider employment as specialist Science and Mathematics teachers. These teachers are from diverse fields including theoretical plasma physics, pharmacology, engineering and aviation. As the comments show, the teachers have embraced the possibilities of interdisciplinary thinking and autonomous team approaches for designing learning because of a combination of strong recruitment, strategic integration of interdisciplinary professional development during professional development, and because the school's vision about

> *'interdisciplinary thinking, is practicably and philosophically 'a good fit'* (EYT 8, T292) for many teachers, including those who are transitioning scientists with an interest in innovative scientific education.

**Three contradictions in an interdisciplinary thinking context** were identified, each of which could be described as arising from competing standpoints about 'teacher professionalism' and 'teacher performance'. Contradictions relate to this site as a key provider of STEM Professional Learning. A senior leader involved in the implementation of STEM in other sites identified limited awareness about the links between 'strategic and structural planning' aspects of interdisciplinary integration in schools so teachers are able to collaborate to integrate curriculum across subjects. From a professional learning provider perspective, conflict issues arise because, after more than five years of a STEM professional learning strategy, many schools are still not interrogating school structures nor devolving power to teachers.



A leader in the case study site explained: *'schools are still struggling to get the subjects scheduled at the same time, so they could actually do some legitimate cross-subject work* (SL1, T1306). School Leaders may want teachers to take full advantage of STEM professional learning, but often without providing adequate strategic planning or structural change considerations so that teachers can actually collaborate to progress integrated curriculum reforms.

The second contradiction identified was related to sites volunteering to participate in professional learning opportunities but leadership not building upon 'new learning' of teachers and schools perceiving reforms and related practice and structural changes needed as all 'too difficult'. The Senior Leader talked about:

> *constantly being hit with, 'well it's alright for you', kind of response; we can't do that in our school… push back. The commitment has to be there ...to the structures … to support teachers; to truly value the decisions that teachers make about their teaching and learning and by giving them the power to make those decisions* (SL1, T554, T569).

Unfortunately, some schools taking part in STEM professional learning are content with 'a mere refinement of curriculum and assessment' rather than a significant 're-imagining of education and … of science education' (Bissaker, 2014, p.56). Without greater effort on the part of participating leaders and schools to align school visions and values, integrative synthesis is at risk of delivering

> the lowest level of integration, generally defined as the drawing of connections across disciplines in a complementary manner relating what is learned in one subject, to another, in such a way that the concepts reinforce each other (Long et al., 2007, p.46).

A leader in this case study school talked about the difficulty in resolving this issue and stated that *'all some school leaders talk about is performance management which is not what I'm talking about*' (SL1, T1449). This school and its leadership team has clarity about what they are on about, whereas participating schools are caught in 'performance management' traps that restrict teachers from implementing structural change so teachers can collaborate.

Efforts to truly integrate curriculum at year 12 are compromised because many students in their final year require a 'TER' score, (a tertiary entrance ranking) for entry to university courses. SACE Board assessment requirements require that teachers design learning and assess learning using single subject frameworks

which, leaders from this site suggest, compromises interdisciplinary thinking and designing in the senior years because they do not offer the same opportunities for teachers and students to truly integrate knowledge 'because the SACE doesn't allow you to work that way' (ET1, 527). Where interdisciplinary visions define everything that the school believes, the SACE, at year 12, remains a barrier to true integration.

> *when students move into single-subject learning areas, they are quite able to do that…. the question students ask me is more out of curiosity, [as to why the opportunities for learning feel different] and why are we moving to this now, when we've always been doing this?…. "To do all of this work and then …well now you've got to year 12 we're not allowed to continue this, and students go, well why are we doing it in the first place?* (TL1, T45).

It was suggested that tension arising about teaching year 12 students in more traditional ways is mitigated because of teachers' capacity to collaborate as a result of group planning structures at the site level at (Years 10 – 11). Despite the barriers, this school is not deterred from their interdisciplinary thinking vision. Site Leaders continue to navigate an interdisciplinary collaborative course of action.

The third contradiction relates to this school's concern about difficulty at the SACE Stage 1 (i.e. year 11 in this State) 'to actually truly integrate':

> *because when you are asked to present your materials for moderation, you're required to show a clean task that fits the assessment task design that is outlined in the SACE, and a clean task isn't necessarily an integrated task* (SL1, T114).

> *so when we package it up and we put it in the bag and send it off …. they open it up the other end and they go, 'well this looks like nothing else I've ever seen before – alarm bells!! So where are the real connections here? how does this school know that this student has actually demonstrated at this particular performance level? So, lots and lots of questions frequently come back to us about that at Stage 1 level* (SL1. T124).

Assessment validity issues related to Integrated Programming and 'co-creation' (Leavy, 2012) practices are yet to be resolved. Interdisciplinary design work without assessment validation undermines interdisciplinary work. If change processes are to occur smoothly, creativity and innovation should be inseparable from collaborative design processes (c.f. Davis et al, 2012, p.5). In the interim, interdisciplinary teacher experts in this school justify their actions and alternative truths about how curriculum can be imagined, planned and implemented including working with the university



sector to provide direct access pathways or portfolio entry for students to some university courses. This school is commitment to building:

> *the structures that support teachers and truly value the decisions that teachers make about their teaching and learning by giving teachers the power to make those decisions* (SL1, T579).

Teachers are also engaging in a significant *'re-imagining' of 'science education'* that includes the interrogation of existing structures and the devolution of power to teachers through professional collaboration and teacher autonomy resolutions. It is inspiring to read and hear about the Integrated Programs designed by teachers at this site and endorsed by practising scientists and educators' in the university sector (Bissaker, 2014, p.57).

There are limited opportunities systemically, however, to claim or share 'interdisciplinary expertise' related to planning, teaching and learning. Mockler explores similar concerns when she emphasises the importance of reclaiming 'curriculum worker' space and consciously growing teacher professional judgment as a matter of professional development priority (2018, p10). Acknowledgement of expertise is an important step in sustaining on-going struggles to progress interdisciplinary curriculum design in senior secondary planning contexts.

There are secondary schools that are sports or arts focused. This case study school is recognised as a 'STEM' site of excellence but what sets this school apart from others is not just its focus on STEM integration and structural change but its focus on the professionalism of teachers. STEM integrative synthesis and strategic structural planning as well as' interdisciplinarity' and 'interdisciplinary thinking' have been the vehicles to achieve 'professional teacher' outcomes. STEM may have been the objective but professional teacher outcomes, knowledge, autonomy, and the capacity to collaborate are equally significant.

> the OECD's comparative review of innovative learning environments concludes that, to be most effective, in addition to the development of individual skills …teachers' need to be able and have opportunities to work collaboratively with others in designing learning environments, addressing the learning needs of particular groups of students, developing themselves professionally, and teaching with others in team approaches (Schleicher, 2012, p. 38).

Through attention to the details of teacher professionalism, especially the capacity of teachers to collaborate, this school has successfully 'reimagined science education as opposed to a notion of the mere refinement of curriculum and assessment' (Tytler, 2007, p. 1). In the process the school has reclaimed key aspects of teacher practice (planning learning), by collaborating to design learning.

**Teacher claims about 'professionalism' in an interdisciplinary thinking culture**

This school's actions reflect a 'leadership' rather than a 'performativity' culture (Bourke, 2013, p.5). The school's 'interdisciplinary thinking' vision includes a focus on the capacity of teachers to collaborate to design Integrated Programs and teachers as curriculum creators rather than curriculum deliverers. This STEM school has a focus on 'integrative synthesis' and structural change and is committed to professional learning, teacher autonomy' and opportunities for creative collaboration.

As described in Chapter 2 (p. 66) analysis is based on teachers' repeated claims about professionalism that are consistent with the descriptions of professionalism by Bourke et al. (2013) who shaped the descriptions based on statements made by teachers about how they enact their roles in response to a 'performative' culture. The descriptions of teacher professionalism created by Bourke et al are a lens with which to view the data. As explained, this study identifies teacher statements about professionalism and aligns teacher statements with two of Bourke's descriptions about professionalism; 'aspirational resistance' which is about promoting leadership rather than performativity and 'assertive resistance' which is about teacher confidence and competence as a reflective practitioner. Bourke also includes descriptions such as 'overt resistance', 'unresisting acceptance', 'passive resistance', 'subtle resistance' (2013, p.5). Two of Bourke's statements have been consistently applied in this analysis because the statements provided by teachers at this school clearly reflect a 'leadership' culture and therefore, 'aspirational resistance' and 'assertive resistance' definitions are used to categorise teacher statements.

Table 4.1 provides examples of 'aspirational resistance' claims about teachers' professional experiences of designing learning together. Statements include descriptions of changes in practice to more collaborative ways of being a teacher; identification of aspects of collaborative design processes that individual teachers



are prepared to take responsibility for and teacher insights about working in a team to design learning with *'the freedom to discuss things amongst ourselves'* (ET4, T399).

**TABLE 4.1: 'Aspirational Resistance' Claims**
Statements reflect teacher leadership rather than teacher performance

- *I would like to see designing learning to increasingly become more collaborative, including students in that process.*
- *I think it's really good to be intensely involved in a (collaborative design) process. You don't want to be too attached to what you have in case it turns out that it would be better off changed; that would be my caution, but you have to feel committed to it, and you have to feel like you're part of it and that you need to be thinking about it and working on it* (ECT3, T 649).
- *There are a couple of areas I need to do more work on. One is more Science as Human Endeavour and/or differentiation. They're my focuses for my personal teaching* (ECT1, 1179).
- *My interest is about task development, making something really interesting, and as long as I'm able to do that, then I'll probably be happier and more willing to sink my teeth into it and through that I feel like I'm giving my best to the team as well, rather than just doing it for the sake of it* (ECT1, J167).
- *The most useful times are when we have freedom to discuss things amongst ourselves. Then all the stories come out and you pick up things that you haven't heard before* (ECT4, T399).
- *There's big problems in Maths education about how to address very abstract things and how do you organise a curriculum around usefulness and utility to the student. So, I've got ambitions that I will crack those problems to get great engagement in Maths across the year levels* (ECT4, T895).

Table 4.2 below provides examples of 'assertive resistance' claims that reflect professionalism rather teacher performance intentions. For example, teachers frequently stated how important leadership roles are in enabling professional collaboration to design learning.

*The leaders were the ones who had to actually make sure that everything was in place so that we could get to design the task'* and *'leadership trust us to design learning* (ET1, 1017).

Bourke et al. (2013) suggest that teacher capacity to discuss qualities that are important to the 'success of the school', or statements that 'express shared leadership' concerns or opportunities, reveal *'aspirational resistance'* standpoints. For example, an early career teacher stated,

*We are jointly responsible for improving the profession and improving what's happening in schools* (ECT3, 752).

**TABLE 4.2:** 'Assertive Resistance' Claims: Statements reflect teacher competence and confidence as a reflective practitioner

.

- *I want to set up direct entrance to university courses with UniSA, with the Aviation Scientific Studies program, because now some of my graduates are getting involved in the Aviation courses, and I'm hearing reports from them that actually the course that they've done here has been useful to them so far. So I'd like to establish some kind of preference or ... credit arrangement.* (ECT4, T356).
- *The importance of designing learning has to be felt by people above too because we can be enthusiastic, but unless everything else is working, when it comes to doing the task design the leaders were the ones who had to actually make sure that everything is in place so we can design collaboratively* (ECT2, T288).
- *Leadership trust us to develop curriculum that's appropriate and engaging, so if we develop something, it's not a case that we need permission to implement it. The teaching teams ,... they have free reign. We could teach them dancing or something like that… I guess at some point they'd go, why are you teaching all the students dancing instead of Science? but it would take a while.* (ET1,1017)
- *To make a big change like this, it requires a great leadership, visionary leadership that can accept disasters. It's not something that everyone would like to embark on, Most people want to feel quite safe* (ET2, T908).

Early career teacher statements generally, strongly reflect 'aspirational resistance' and 'assertive resistance' standpoints. Experienced teachers' responses can be described as affirming of the culture, but not to the same degree of enthusiasm as the less experienced teacher. This sample is too small to be conclusive but they do



acknowledge the strong contributions of early years teachers in collaborative design contexts. A senior school leader observed

*early-career teachers who have come in with PhDs in Physics and Biochemistry really get the interdisciplinarity stuff because that's what their world has been like and of course the real world is not separated* (SL1, T637).

**Teacher claims about 'professional autonomy' as an outcome of designing learning collaboratively**

An early career teacher talked about the value placed on teams collaborating professionally.

*It's almost like it's mandated. Everybody's got to collaborate or die!* (ECT1, T710).

*Teacher X is mentoring me when we team teach, and when teacher Z and I team teach, we give each other feedback in an informal way. So, I get mentored from just being around all these great teachers We operate socially, in Vygotskian terms, and that's our strength, and coming here just triggers opportunities to collaborate* (ECT1, T435).

Table 4.3 below gives a range of examples of teacher claims about professional autonomy.

**TABLE 4.3**: Dimensions of Professional Autonomy claims:
(The will and capacity to justify and develop core practices)

- *"The time given for planning is significant and it means that you never get too busy to not talk to colleagues about what's happening, and I think that is something really valuable".*
- *"The experience has been transformative, if for no other reason than just being exposed to so many different ideas and thinking about them you have to start using them because they're just there"* (ECT3, T. 676).
- *"My interest is about task development, making something really interesting, and as long as I'm able to do that, then I'll probably be happier and more willing to, you know, sink my teeth into it and through that I feel like I'm giving my best to the team as well, rather than just doing it for the sake of it"* (ECT2, T166)
- *"As the junior member of the team, I don't contribute as much to the content, but I make up for it by doing a lot of the groundwork in terms of doing the UBD, (Understanding by design framework) I'm a bit particular about the way things are written and worded, so I spend a lot of time, when they have a good idea, sort of getting the language right"* (ECT1, T219).
- *"I teach with him in the same space. He's old school, I'm learning content from him, but not just content, ways of teaching it. I'm learning ways of teaching and how he explains things is very different to how I would, and it's nice to have the ability to see someone else explain something in a way that's effective"* (ECT1, T344).

A senior leader (SL1) at the school pointed out that early career teachers' at the school build such professionalism through team membership:

> *The teaching teams have the licence; (the autonomy) to do their own timetabling, their own staffing that goes with that, their own assessment design, their learning design, all of that is left with the team, not with individuals, with the team, not with the leader, not with the SACE Coordinator, with the team to do that, and it's all around that innovation space* (SL1, T323).

They also talked about the importance of a 'common language'.

> *strategic directions and school visions and why it's important [to have these conversations], so that when teachers shape the work they're doing with their team they have that shared vision and shared language: that is a really important part of that process* (SL1, T50).



A consistent and common language defines and guides reform visions at this school. Leadership team members talked about similarities between teachers being greater than their differences and that a team's common language is a key reform instrument. Interdisciplinary thinking and design processes are strongly contested spaces and a common language to articulate meaning, essential. Durmus refers to thinking in this space as a *'linguistic adventure'* a space where teachers deconstruct and reconstruct knowledge from multiple perspectives (2015, p.31).

The development of a common language also contributes to a strong sense of 'collective autonomy' as well as trust in the teacher as *'developer of curriculum'* rather than *'deliverer of curriculum'* (Mølstad, 2015b; Priestley and Biesta, 2013, Mausethagen and Mølstad, 2015, p.9). A common language supports school leaders and teachers for the duration of reforms to maintain interdisciplinary thinking, planning integrity and momentum in order to preserve an interdisciplinary planning culture that has been nurtured for more than a decade at this site.

> *You've got a Maths teacher and you've got an English teacher, or a History teacher, they actually teach in different ways, their language about teaching and learning is different. When you first get them in a team they start talking about stuff, they're going, what are you talking about? and then after a while they work out what the word is that they're using is actually different but it's the same thing. It's incredible to sit back and watch* (L1, T157).

This analysis of the data refers to Mausethagen and Mølstad (2015, p.8) 'dimensions of professional autonomy', which include consideration of two dimensions of professional autonomy: 'the will and capacity to justify and develop core practices' and 'the will and capacity for self-governance'.

> *Leadership trust us to develop curriculum that's appropriate and engaging, we could teach them dancing or something like that and I guess at some point they'd go, why are you teaching all the students dancing instead of Science? but it would take a while* (ECT1, T1070).

The point is that if dancing is seen as a way to teach science, and the team agrees, then so be it! The trust and belief in design teams to make curriculum decisions highlights the capacity of these teams for 'self-governance'. If tensions arise in teams working with autonomy, Mausethagen suggests, team members are more likely to negotiate resolutions within the local context' (Mausethagen, 2013a; Stone-Johnson, 2014; Wilkins, 2011, in Mausethagen, 2015, p.31).

Teachers identify time to talk to colleagues as significant and align 'time', with the ability to develop core practices, such as task development or providing descriptions of a task within an '*understanding by design* framework', which can be shared with other team members. Teachers talk about the importance of consistency of language to progress interdisciplinary thinking, designing and learning.

Early career teachers interviewed were very enthusiastic about the potential of governance responsibilities. They talked about the need to be *"more collective as a profession"* and the significance of developing *"this collective idea that* teachers *are jointly responsible for improving the profession"* (ECT3, T753). For a teacher in their second year of teaching, these comments justify the school's focus on nurturing leadership and trust in the capacity of teachers to lead curriculum reform. Positioning teachers in teams has resulted in team members making decisions about content based on their collective decision-making and capacity to contest the validity of particular knowledge. These design arrangements not only appear to promote autonomy, but encourage collective professional accountability reflected in the statement above about 'teachers joint responsible for improving the profession'.

Professional autonomy' mechanisms include a focus on a common language and experimentation with how space can be used to support the professionalism of teachers including the development of teams of teachers to design learning with greater autonomy that enables a focus on *'designerly cognition' and 'designer identities'* (Chua, 2009, p.160). The school's vision has shaped both professional teacher identities and school-level processes so teachers can exercise greater control over professional practice.

**Teacher claims about changes to professional practice**

Table 4.4 below provides examples of claims teachers make about how their practice has changed as a result of their engagement in collaborative design practices.



**TABLE 4.4:** Teacher claims about changes in practice (teacher knowing, being and doing and teacher core capacity to collaborate

- *'Working across the disciplines has caused me to use some of the ways of thinking that I would have used in some contexts in others. The walls between subjects are extremely fluid…. 'Interdisciplinarity 'is a good fit with my inclination'* (ECT3, T164, 156,247).
- *'We are encouraged through school generally to think … this is Physics, this this is English. The disciplines are very narrowing points of view.. I don't think it's obvious unless you really think about it deeply. I started thinking about it when presented with this idea of an integrated curriculum and then I started to really have to think about the disciplines and what they're about. I've been dwelling on these ideas'* (ECT4, T797).
- *'A nice things about collaborative design is that it can be an ongoing thing, so as we interact with it, and as people have ideas, you have the flexibility to reshape it and add things. So, I think it's really, really important to have that ongoing commitment to collaborative planning* (ECT3, T465).
- *'The culture here is very open to ideas. There is no reason you can't suggest something and be taken seriously. It helped me learn from a whole range of people's perspectives'*
- *"From the start to the end of the year, there's a huge difference in the way I think as a teacher and my opinion towards integrated learning* (ECT2, 705).
- *My education never made me really connect ideas, … everything was set in that textbook"* (ECT2, T69)

Teacher claims from this site about the transformation of practice are examples of what Andreotti refers to as 'epistemological shifts in teacher practice' arising as an outcome of working deeply with diverse knowledges. Andreotti suggests such experiences *'help shift educators' epistemological understandings about knowledge, curriculum, teaching and learning to 'provide innovative curriculum solutions'* (Freeth and Andreotti, 2012, p.2).

Epistemological shifts are evident in teacher statements that describe how teacher 'knowing, doing and being' (Martin et al, 2003) have been challenged philosophically and practicably including teacher core beliefs and understandings related to teacher

knowledge, curriculum, teaching and learning. For example, after designing Integrated Programs of learning for two years, an early career teacher concluded:

> *disciplines are often presented from very narrowing points of view. I don't think it's obvious at all unless you really, really think about it deeply. I started thinking about it deeply when I started teaching and being presented with this idea of the integrated curriculum* (EYT4, T840)

Another teacher shared that working across the disciplines has caused them to use some of the ways of thinking that they would have used in one context in other contexts because the walls between subjects are extremely fluid and this helped them learn from a whole range of people's perspectives (ECT3, T157, T165).

The transformation of teacher thinking and practice from separate disciplinary to more interdisciplinary standpoints and from individual to more collaborative practices has required structural and organisational changes such as the allocation of *'time'* and the development of structures so teachers can be part of autonomous teams with the capacity to collaborate to make decisions about designing curriculum.

Immersion in interdisciplinary team contexts facilitates opportunities to explore their collective knowledge and imaginations and develop confidence to embrace interdisciplinary perspectives. An early career teacher, for example talked about a school that 'is very open to new ideas with a lot of latitude to experiment and try out new things' (ECT4 T134, 147) and a Teacher Leader talked about a school culture that 'pushes teachers outside their comfort zone so teachers were able to constantly challenge themselves as a teacher (TL1, T789).

The success of largely autonomous design teams is dependent on the capacity of teachers to interact 'very effectively'. This school demonstrates that it is possible to make structural and organisational changes so that teachers engage in interdisciplinary thinking time. Salonen et al, note 'the mutual core competence of a teacher is the capacity to interact effectively. It is a basis for shared expertise' (2015, p.8). Shared expertise needs to be understood as core teacher work and sharing expertise is easier 'if teachers know how their colleagues from different faculties and disciplines describe their own knowledge and competence' (Salonen et al, 2015, p.3). Building capacity to 'interact effectively' aligns with teacher capacity for self-governance and validates steps taken in this site to create structures that nurture,



teacher 'designerly cognition'; the logic that guides any activity aiming to transform a situation into a preferred one, and teacher 'designer identities' (Chua, 2009, p160).

In this site we see a sense of 'collective ownership' of learning objects created collaboratively, an important outcome of teacher capacity to interact *'very effectively'*. Artefacts created collectively help reinforce the significance of 'collaborative design' as a practice. An early career teacher talked about

> *spaces for individualism within collectivism and it's the individual efforts with that mindset of working as a team, not just doing this because this is going to be good for me. It's, I'm going to do this in a way that will work best for my team* (ECT1, T903).

> *It positions us as better teachers with better material, there's no doubt about it. If you work together, you'll produce something that is better than you would have produced on your own, yeah, it's just a no-brainer* (ECT2, T1010).

**Metaphors teachers use to describe 'collaborative design' practices**

Table 4.5 includes metaphors teachers imagined that describe the collaborative design experience. A Teacher Leader suggested *'planning learning across the disciplines'* is like *'a dinner plate of food'* where interesting things happen when the food is mixed together. He justifies this imagery by explaining that

> *the disciplines are artificial and, in reality, the disciplines have to work together and that's what we are doing here. There are very few big ideas /inquiry questions that are discipline based… they actually have to work together* (TL1, T68).

A contrasting perspective about *'planning learning across the disciplines'* is provided by one of the early career teachers who likened the process to potentially *'*destroying something of value' and suggested that integrated curriculum pretends that there are no boundaries. This early career teacher had just started integrating chemistry and physics to design a 'Scientific Studies' Integrated Program and was asking himself key questions about '*how does physics make sense in terms of chemistry'?* He had concerns that that *'some great point* [may have] *been missed, or some great opportunity, wasted*'. It would be true to say that the design immersion experience was making him question his identity as a science teacher; for this young teacher the challenge was causing significant dissonance with his current position. Dissonance is one of three iterative processes for teacher learning as described by Timperley

(2007, p.17). The outcome for this teacher was not clear by the end of data gathering but what was clear, was the learning taking place in safe spaces with colleagues.

A 'football' metaphor was also used to describe the experience of planning learning across the disciplines:

> *It's like trying to get the ball to the other end of the ground you can't just pass it over and expect it to happen. There needs to be a system; some give and take first. We need to work together to make an intercept at that right point, so that we're all at that same point* (ECT1, T265)

Another metaphor suggested the experience was like *'something organic; some kind of living plant-like thing; something kind of dynamic; …. something evolving, something that occasionally sprouts a new tendril'* (ECT3). It was also described as

> *a rollercoaster ride because you're starting something new and you're thinking, I'm a bit scared. …there are places you need to tweak and improve but you also have the excitement, so it's a good, a great, rollercoaster ride* (ET1, T861).

The descriptions suggest uncertainty, excitement and complexity of the design process and highlight teaching as a 'knowledge intensive profession' (Schleicher, 2012, p.11). The metaphors too, provide an insight about dispositions required to design learning collaboratively in a highly contested knowledge space and the imagery speaks to us about the capacity of teachers to collaborate and what can be achieved if they do.

See Table 4.5 below for metaphors that describe 'collaborative design' experiences in 'interdisciplinary thinking' contexts.



**TABLE 4.5:** Metaphors about what it's like to design Integrated Programs collaboratively.

| |
|---|
| *A meal: You don't go out for a meal and have vegetables and then you have meat, like everything is mixed together and that's where the goodness is, that's where the interesting things happen…..*<br>*Justification: The disciplines are artificial! In reality the disciplines have to work together that's what we are doing here. There are very few big ideas /inquiry questions that are discipline based. They actually have to work together.* |
| *It's like a game of football: Imagine that your English teachers are forwards, Science teachers are your mid-fielders, Maths teachers are you defenders; everyone is doing their part to make it come together.*<br>*Justification: People have to work with others. It's like trying to get the ball to the other end of the ground, you can't just pass it over and expect it to happen. There needs to be a system; give and take! We need to work together!* |
| *Something organic: it's some kind of living plant-like thing. Something kind of dynamic; something that's also squishing around, something evolving, something that would occasionally sprout a new tendril.*<br>*Justification / proviso: there's a lot of elements of frustration in the process … when you're going around in circles. …..* |
| *It's a rollercoaster ride: It has its dips, but you know it's good. There's something exciting in front, You'll have to re-think some of these ideas, but that's fantastic.*<br>*Justification: It is a rollercoaster ride because you're starting something new and you're thinking, I'm a bit scared! There are places you need to tweak and improve but you also have the excitement of a great rollercoaster ride.* |
| *Sometimes it's like watching something of value get destroyed*<br>*Justification: in some ways the integrated curriculum pretends that there are no boundaries but at the end of the planning there is a thing that works, but could it be better? or did we actually destroy something of value here?* |
| *It's an organic way of working. There are shifts and changes the whole time … its organic like the approach we have towards interdisciplinary thinking and planning is organic …… it changes …. we need to revisit, refine and adapt collectively!* |

For details about analysis of teacher metaphors across all of the case study sites see Section 8, Chapter 8.

## SUMMARY

This school has achieved a level of robustness by not ignoring what we know about teachers collaborating, including an awareness and understanding about the domains of teacher professionalism as defined in the TALIS index of teacher professionalism (Schleicher, 2016, p.37) (Appendix #1). This includes teachers being able to work with diverse knowledge, with significant autonomy. Additionally, collaborative design provides a basis from which teachers can contest knowledge

and achieve ‘excellence’ (Hattie, 2003, p4), and ‘collective excellence’ (Hattie, 2015). The SACE ‘Integrated Program’ framework encourages ‘collective efficacy’, a belief teachers’ hold, about the ability of a school to support student achievement (Donohoo, Hattie, Eells, 2018. The Integrated Program Guidelines offer opportunities for teams of teachers to design programs of excellence and relevance that can be sustained over the longer term by design teams responsible for the ongoing maintenance of existing programs. As a result, many of the eight central studies Integrated Programs at this site continue to be implemented after a decade or more. As this site is a lead STEM site all staff continue to have a role in promoting ‘STEM integration and structural change’ reforms that contribute to affirming teacher convictions about collaborative interdisciplinarity design work in future contexts.

The SACE reforms 2008-2012 and the recent focus on STEM education have offered a potential reawakening of interest not just in STEM and interdisciplinary thinking and learning but opportunities to restructure schooling and build teacher identity as creators of curriculum as a result of teachers collaborating to design learning. This school has demonstrated the potential for integration of STEM, with implications for other disciplinary areas, both in junior secondary and in the senior years. Mockler argues, that

> while curriculum integration might provide a possible pathway to realise contemporary goals for Australian education, to a large extent this will rely on opportunities for the teaching profession to develop a robust sense of identity around ‘curriculum work’ to reclaim the space, (of curriculum creator) over that of ‘curriculum deliverer (Mockler, 2018, Abstract).

Mockler ‘s argument concurs with the experience of this school that reclaiming the space is a key factor in achieving a level of robustness about teacher identity. In this site, a contributive leadership model supports a more collective teacher identity built on respect and trust in the ‘the decisions teachers make about teaching and learning’. This is demonstrated *‘by giving teachers the power and the time to make these decisions’* (SL1, T562).

Donohoo cites six enabling conditions for ‘collective teacher efficacy’ that are reflected deeply in the work achieved in this case study site. They include ‘the advancement of teacher influence, goal consensus, teacher knowledge about one another’s work, cohesive staff, responsiveness of leadership teams and effective



systems of intervention’ (2017). These conditions are all unmistakably evident at this school and most significantly each condition is fostered as a result of a team approach for the design of learning.

This school was chosen as a case study site particularly because of its collaborative design approach to design STEM programs, but it is the teachers’ and leadership team’s rigorous commitment to making sure ‘interdisciplinary thinking’ happens that determines organisational and structural changes that link directly to teacher work practices that inspires teachers to be better, collectively. This is what is particularly inspirational and worthy of our attention. Their ‘Interdisciplinary thinking’ vision ultimately influences teacher beliefs and how they think and act; and what teachers think and believe is central to how teachers practice teaching. One of the best ways for this to be realised in any context, is collectively.

An interesting feature identified in this study relates to early career teachers recruited as part of a ‘Teach SA’ (South Australian Workforce Strategy) to encourage science professionals to consider employment as specialist Science and Mathematics teachers. The professionalism and the enthusiasm of teachers in this site to engage in interdisciplinary thinking and planning has been a real revelation and particularly so, for early career teachers recruited as part of the Teach SA Strategy. The statements of the four early career teachers interviewed strongly reflect ‘aspirational’ and ‘assertive ‘teacher resistance’ standpoints (Bourke et al., 2013). They talked about, for example, being ‘*jointly responsible for improving the profession’, ‘never too busy to talk to colleagues about what’s happening’*, and suggesting to that *‘this is something really valuable’* and *‘the experience has been transformative, if for no other reason than just being exposed to so many different ideas and thinking about them you have to start using them because they’re just there’*. Going further, one teacher stated they *‘would like to see designing learning to increasingly become more collaborative, including students in that process’.* A school leader also observed that ‘early-career teachers with PhDs “really get the interdisciplinarity stuff’ (L1, T637).

The relationship and confidence that early career teachers at this school demonstrate as part of reconceptualising and integrating curriculum with other

teachers is perhaps the best recommendation in moving interdisciplinarity forward in our schools. Mockler talks about

> inaccurate understanding about the role of 'teacher' in curriculum creation because leadership rarely makes it clear that the job is to cause understanding, not merely to march through the curriculum and hope that some content will stick (2018, p.9).

The Leadership Team at this site, through a focus on teachers as professionals and the creation of various enabling conditions, as described by the teachers and leadership team members, have successfully made it very clear that teachers at this site are creators of curriculum with the responsibility for curriculum. The fact that some of these teachers have PhDs and have practiced in various scientific fields also helps, but it is the enthusiasm and the professionalism of the teachers at this site, not just in relation to STEM teaching and learning but also in relation to the teaching profession and for schools as learning organisations, that is particularly inspirational and cannot be dismissed in any future position on curriculum integration, particularly regarding integration in the senior years of schooling.

As one teacher explained, the school's vision about integration and 'interdisciplinary thinking' is a *'a good fit*' (ECT3, T292) with his particular brand of knowing, doing and valuing (Martin et al, 2003), teacher work.



# CHAPTER 5

## KEY CASE STUDY 3: 'A MORAL IMPERATIVE TO DO SOMETHING ABOUT STUDENT ENGAGEMENT'

Challenging data sets at this case study site convinced teachers and the school community to accept the possibility of an integrated curriculum vision as a way to engage students in learning in a secondary school context, including students doing one or more South Australian Certificate of Education (SACE) subjects. Subsequently, self-identified members of staff embraced opportunities to collaborate professionally; to imagine and realise significant structural change as well as less insular attitudes; to plan, teach and learn through the integration and synthesis of curriculum content. This case study site has positioned itself at the interface of innovative practices as part of the 'Big Picture' network of schools that includes professional collaboration opportunities that challenge teachers' traditionally held beliefs about planning, teaching and learning.

### FIRST IMPRESSIONS

> *My initial visit to this school) began with a conversation with the school Receptionist. I arrived early, and she had just dealt with the early morning rush of students who were late or with phone calls from parents saying that their child was going to be late. Once the morning rush was over, I inquired about how long she had been at the school and what changes she had seen. She had been there a decade or so and her conversation was mainly about the last four years and how things had changed for students. She talked about student learning and what students were doing; their enthusiasm for learning and explained some of the intent behind student work on display in the front office. She enthusiastically talked about improvements in student attendance and the fact that behavioural issues no longer required the use of a withdrawal room nor front office staff administration intervention. She mentioned how considerate the students were when they came to the front office and she was in no doubt about the significance of the extensive reform agenda making a real difference. Her optimism for the future potential of what could be achieved was very believable.*

## SCHOOL CONTEXT

This Case Study is situated in a government school within the South Australian Department of Education and Children's Services. The school is about an hour's drive from Adelaide, the state's capital city and despite being zoned metropolitan, this school has strong country values and is closely involved with its community. Some of the following context descriptions about reforms in this case study school are adapted from a description about the restructuring of this site beginning in 2011, as part of an OECD 'Innovative Learning Environment Project' in South Australia.

The initiative was a whole school and community response to poor student engagement in learning over a decade or more. With the consent of the school community, there was a deliberate shift away from more traditional structures for organising teaching and learning, towards structures and processes that more accurately reflected the world in which young people live. For example, the practice of grouping one teacher with 25 students in an isolated classroom was discarded in favour of more flexible learning suites, where 120 students shared the space with 6 'Teacher Engagers' working with an interdisciplinary and personalised approach to planning, teaching and learning (OECD, 2011, 'Innovative Learning Environment Project').

The structure involved grouping students into Learning Academies of about 130 students in each year level and at the time of interviews in 2016, the Academy structure was implemented from year 8-10 with some of the organisational arrangements supporting senior years students in the SACE. The school was also expecting their first SACE graduates in 2016. The OECD Innovative Learning Environment Project in 2011 reported

> Students have total choice in who they wish to work with, what aspect of their learning they wish to engage in at any point in time, which learning space they would like to work in, which teachers they wish to access and for what purpose, how long they spend on a task, and how they will demonstrate their learning (OECD, 2011).

In relation to the development of more integrated approaches for the design of learning teachers at the school are guided by 'Learning Frontiers' principles.



Learning Frontiers is a large-scale international and national collaborative enquiry to develop professional practice that increases student engagement in learning. Teachers themselves construct new knowledge the education community needs to move the professional practice of every Australian teacher forward based on four design principles for engaging learning based on the design of learning that is co-created, personal, connected and integrated (Learning Frontiers, 2013, p9)

Curriculum at the site is presented as integrated themes and units of work

> that transcend traditional subject boundaries. The school intends the discipline areas to become more integrated over time, allowing students to engage in more open-ended investigation, negotiated with individual students. These investigations are intended to enable deep inquiry and research into interdisciplinary themes relevant to adolescent learners (OECD, 2011)

From 2012 to 2016 teachers created interdisciplinary programs of learning that met Australian Curriculum standards for students in (Years 8-10) and for (Years 11 -12) students, teachers designed learning using SACE frameworks, including the Local Programs and Integrated Programs Guidelines and the 'Integrated Learning' stand-alone subject SACE Framework.

At the time of the interviews in (2015 – 2016) the school community and teachers at the school had noted an improvement in student engagement, a reduction in behavioural issues, and an increase in ownership and enthusiasm for learning (DECD, 2011).

## RESTRUCTURE TO IMPROVE STUDENT ENGAGEMENT

Restructuring, to improve student engagement was understood as 'a moral imperative', by the Principal. In response to statistics about 'student engagement' high levels of suspensions, exclusions and poor attendance, the Principal posed a question about *'what an engaging school would look like and what barriers there were to achieve an engaging school?*' (P, T70). As well as reflecting specifically on local knowledge and data, teachers were asked to reflect deeply on what young people at the school and elsewhere were saying about engagement in learning. A large-scale survey implemented at the school identified student desire for increased

agency over how they learn in the classroom and beyond; more of a say about what they learn, and better teacher-student relationships.

Identifying a school vision about 'student engagement coincided with the school community agreeing there was 'a moral imperative to ditch the old system" (P, T104). A 'moral imperative' is a major wake-up call, reflecting the urgency and anxiety of stakeholders involved at the time.

> *We had to do something; we were rock bottom. We had an incredible amount of kids in 'time out' every day. We had suspensions and exclusions, violence, poor results and ineffective teachers in ineffective classrooms, and the kids not learning* (TL2, T102).

As well as responding to a perceived 'moral imperative', leadership and teachers were persuaded by the ever-present rhetoric about schools and teachers failing to prepare students for uncertain futures. Decisions were also guided by 'Learning Frontiers' principles, as discussed, student data, local story, local knowledge and leadership and teacher understandings about the importance of place and time in a school community and their capacity to imagine what their school could be. The impetus to pursue whole school change comes from a very deep place of 'knowing' as well as leadership that are prepared to take their teachers and students on a journey of discovery to another place often against the tide and with limited support and without really knowing what that place will be like.

The Principal (P, T62) talked about the absence of system-wide reform visions and schemes to engage other schools so that local school reform initiatives have the potential to be 'scaled up' to complement another's reform efforts and as a way to access potential funding opportunities and building programs.

The implementation of reform efforts at this school since implementation in 2011 has generated considerable interest including (as of April 2015), 991 visits from people across the country and internationally to learn about reform initiatives implemented. Despite this, the Principal stated there had been limited interest from local education authorities to provide opportunities to progress, re-trial or take to scale the reforms making a difference at the local level.



**THE PROCESS TO INTEGRATION & STRUCTURAL REFORM**

To engage teachers in the reform process, school leadership teams supported teachers to reflect on student data that showed that education provided at the school was often '*disconnected from students' reality and schoolwork was often boring and as educators, teachers themselves often felt disengaged'* (Learning Frontiers, 2013, p.5). Compelling data sets convinced teachers and the community to accept the possibilities of an integrated personalised curriculum vision to engage students across the junior secondary school. Data sets included student engagement survey data, Circle of Courage' and well-being survey data, fitness testing; supported by considerable evidence about improved literacy, numeracy achievement, engagement, attendance, behaviour (compared to the previous traditional schooling structure).

Structural reform and integrated synthesis across subjects was the reform pathway agreed to and interested teachers

> *had free rein to play and come up with some structures that were possible, free from dissenters about what this education vision might look like* (P, T66).

The Principal recalled teachers savouring the opportunity to imagine options that would never have been freely articulated at a normal staff meeting and saying things like, *Look, I'm just thinking out loud, but I've got this idea* (P, T62).

Self-identified members of staff embraced opportunities to collaborate professionally to imagine and realise structural change and more integrated approaches for the design of curriculum by not only reflecting deeply on 'student engagement' and the 'personalisation of learning' but by also intentionally embracing a *'less insular attitude'* and approach to education resolutions.

**'Personalisation of learning' and 'preparedness to network'**

'Personalisation of learning' and 'preparedness to network' were identified as the cornerstones of this school's student engagement vision. The school investigated what was happening in the 'personalisation' of education space nationally and internationally through interaction with state and national government policy

initiatives such as ‘Learning to Learn’ and ‘Teaching for Effective Learning’ (TfEL) as well as being influenced by ‘Learning Frontiers’.

The school’s focus on teacher preparedness to network and develop collective inquiry networks were realised through the Learning Frontiers networks in Australia and the ‘Innovation Lab Network’ in the United States. These collaborative inquiry networks have helped challenge teachers’ traditionally held beliefs and ‘liberate professional practice around innovation’ (Gonzalez, 2014, p.11).

> *The biggest driver for the school was student engagement and the best leverage was personalisation* (P, T1112).

The ‘actions’ local analysis gave rise to included removing all those things that were understood to be getting in the way of personalisation and making an engaging school.

> *We just got rid of them and that included faculty heads, it was classrooms, it was, you know, tables and chairs, it’s timetables, all of those things, so they had to go. People often come here and want to do a little bit of what we’re doing, and you can’t do two hours on a Thursday afternoon of integrated learning. That’s an absolute nonsense* (P 1, 1117).

**Imagining alternative schooling structures and discourses about ‘engagement’**

Imagining alternative schooling structures and discourses about ‘engagement’ was prioritised. Staff developed a document, ‘The compelling case of change’, to provide local evidence and information for staff and the community about alternative schooling visions and opportunities for structural change and teaching and learning. Opportunities included immersion of teachers in education research and networking opportunities.

Professional collaboration opportunities at this site were prioritised as a foundation for transforming teacher learning and to that end,

> *Governing Council ensured that teachers get out and see what’s going on, and every teacher has opportunities to go to schools interstate, overseas, looking at what’s going on, building their capacity, in teams. They always go for multiple days, never for a day. That’s the culture* (P, T279).

The school’s actions are influenced too by developing links to ‘Global Education Leaders Partnerships’ (GELP): education leaders working together globally to



transform education systems. GELP promotes learning that is *‘highly engaging for teachers and students, is connected, co-created, integrated and personalised’*. It encourages teachers to interact with outside influences where teacher practice and content knowledge can be challenged and where teachers can experience new ways of thinking and doing and where teachers can play, imagine and explore various models or try on new behaviours.

**Creating and extending the Academy of Innovative Learning**

The process of creating and extending the Academy of Innovative Learning over a four-year period to include (Years 8, - 10) students is summarised by a Team Leader.

> *The first year was easy because we had a group of teachers who were passionate, enthusiastic. We cried a lot, we laughed a lot, we worked really hard, holidays, weekends, and we always knew the following year was going to be tricky because we were going to have to enlist teachers who were not committed to the Academy of Innovative Learning, (AIL) but we needed them to teach year 9 so that was a bit hard, but most came on board. We still had some who were difficult, and then of course last year we introduced year 10, so there was now less and less opportunities for teachers just to specialise in senior school* (SL2, 741).
>
> *Most people accept that this is the direction the school is taking, so we’ve got to make the most of it* (SL2, 755).

Building the capacity of teachers to engage in reform was a challenge for leadership:

> *Changing that mindset from curriculum deliverers to curriculum creators is a big learning curve. Tiger Woods spent a year un-training his golf swing before he could retrain and so unlearning what we have experienced and relearning alternative integrated ways to teach, is hard* (TL1, 748-753).

A Teacher Leader talked about the energy, effort and thinking that school reform processes demand, and how incredible and exhilarating it had been. Their summary of the resulting school culture was described as

> *a teaching and learning environment with a focus on the learning capacity of both teachers and students* (TL2, T79).

This observation about ‘learning capacity’, not only of students but also of teachers, is a ‘shift in thinking’ from the ‘student engagement’ vision that drove the initial reform efforts. Freeth and Andreotti advise that

> as ideas of 'shifting thinking towards the twenty-first century gain popularity, it is necessary to value and grow the importance of the intellectual independence and professional autonomy of teachers as curriculum decision makers, as well as critics and the conscience of society (2012, p.7).

Questions asked of teachers about how they understand their role provide insights into the links between 'collaborative design', the transformation of teacher practices and the potential for the transformation of school cultures.

As a consequence of the decisions made, a reform agenda and a structural reform vision evolved that included major changes to the physical environment and, of specific relevance to this study, major changes to the role of teachers that are in stark contrast to the role of teachers in environments designed traditionally to protect and preserve the standardisation of learning ('Learning Frontiers', 2013, p.9).

**Reform supported by a national large scale 'collaborative inquiry' initiative about 'student engagement'**

The 'student engagement' vision strongly aligns with the key objectives of 'Learning Frontiers'; a national reform, large-scale collaborative inquiry initiative about student engagement. It is an intervention program that aims to move the professional practice of every Australian teacher, forward. This large-scale diffusion program offered ongoing support to this case study site to commit to significant structural and curriculum reform. Additionally the program provided professional collaboration and networking opportunities that have greatly influenced the direction the school has taken to progress key elements of their reform agenda.

Learning Frontiers brings together clusters of schools nationally and internationally as 'design hubs' to explore professional practices to increase student engagement in learning and explore teaching, learning and assessment practices that are built upon four design principles for creating an 'engaging learning' culture. Learning that is connected, co-created, integrated and personalised (Learning Frontiers, 2013).

From a Learning Frontiers perspective 'personalised learning' includes 'learner choice, voice and agency', 'learner passions with real world learning', 'flexible learning environments' and 'collaborative personal learning networks (PLNs)'. This use of 'personalised' language is helping to drive the curriculum decisions and



actions implemented as well as relationships developed between schools, and between schools and other partners to spread teacher knowledge about student engagement beyond the design hub where the practice originates (Learning Frontiers, 2013)

The Principal (TL1, T161) contrasts the Learning Frontiers dissemination of knowledge with the professional collaboration model available to schools in this state. The Principal described what they were doing as

> *Here's what we're about to trial, who wants to work with us?' and the prevailing model available to schools, which promotes 'here's what we've done, come and learn from us approach* (P. T1164).

For example, they describe trials linked to students co-constructing learning with teachers and a process that includes the re-formulation of questions that guide the hub's trialling efforts. In this instance, this includes questions like '*will this actually work? Can the kids use the project-based learning framework to co-design curriculum'?*

Exploration of this large scale collaborative inquiry space has resulted in the school making links to other organisations that promote large scale professional collaboration such as the OECD Centre for Educational Research and Innovation (CERI), about *'the nature of learning and using research to inspire practice'*; and the Global Education Leaders' Program (GELP) about 'redesigning education: (and) shaping learning systems around the world', which 'combines with system leaders in thirteen jurisdictions to transform education systems to make them fit for learning in the 21st century' (Learning Frontiers, 2013, p.11). For example, the Principal described the school's search for integrated units that resulted in richer and deeper levels of engagement and subsequently made links with 'High Tech High Schools' in America to provide staff with design direction.

When school leadership helps staff align large-scale reform initiatives with reform imagined at the local level it offers a significant level of comfort and hope to those engaged in reform efforts. Education reform is all too often the subject of much derision across the various levels of the education community. For example,

because this site is engaged in significant structural and curriculum reform they are continuously scrutinised.

Such strategies, at the local level, help to maintain reform momentum as does being part of large-scale, professional collaboration, system-level reform interventions that offer leaders and teachers support at a distance. Outcomes of re-culturing are demonstrated at this site through new forms of interaction and professionalism such as joint problem solving, shared data sharing, and decision-making and distributed leadership.

> When these endeavors are part of a school change initiative, research reveals that such a collaborative culture leads to higher levels of trust and respect among colleagues, improved professional satisfaction, improved instructional practices, better outcomes for all students, and school change that is maintained over time (Dufour et al., 2006; Fisher & Frey, 2003; Fisher et al., 2000; Friend & Cook, 2007; Joyce & Showers, 1995, 2002; McLeskey & Waldron, 2002a; McLeskey, Waldron, So, Swanson, & Loveland, 2001; Waldron & McLeskey, 1998; Waldron, McLeskey, & Pacchiano, 1999) (cited in Waldron, McCleskey, 2010, p.59).

Schools that are keen to scrutinise but not so keen to commit to some level of re-thinking schooling, despite the evidence of the benefits to do so, are potentially undermining the efforts of those schools prepared to engage in reforms. This means that minimal reform efforts in one site, impacts widely on reforming school efforts systemically. Educators' perceptions about a systems commitment to reform agendas therefore matters, as is evident in this case study. A lack of systemic resolve impacts on the capacity of all teachers across all schools to continue to engage with innovative education resolutions routinely.

For all staff at this school there is a contradiction too between engaging in reform mandated by the current system and at the same time respond to their own school's 'moral imperative' reform agenda, to meet the learning needs of their students.

This case study is an example of a school that has actively sought alternative education resolutions for 'student engagement', even though what they were doing

> *was really hard work and we are under so much scrutiny, any tiny thing that goes wrong is because we're doing something different, and when you think back to the old system and the nonsense that was going on in classrooms that no one ever challenged' that you've really got to be thick skinned and really believe in what you're doing, and keep gathering the data* (P, T495).



The school has also challenged the dominant mindset of many of their teachers by reprioritising how teachers work and how they design learning. They invited teachers to re-imagine more integrated, 'inquiry based' design and learning approaches with a focus on building students' capacity to learn, in preference to a subject mastery design approach. This reprioritisation of focus, driven by a moral imperative, has been risky for both teachers and students and the mixed response that continues, as described by early career teachers interviewed, suggests that most but not all staff are convinced. In this instance the six teachers interviewed and the front office spokesperson who provided a community perspective, were all thoroughly convinced that 'change was a moral imperative'. The way to get there may not have always been agreed to but there was agreement that 'change through a focus on 'student engagement' was the way forward.

The Principal celebrated the opportunity for teachers to collaborate to 'share, learn, trial and support the scaling-up of collaborative reform approaches (P, T64). Learning Frontiers' less insular reform agenda is suggestive of Indigenous pluralist approaches to change, that looks elsewhere for inspiration, combining knowledge to create new innovations, new ways of thinking and understanding (Yunkaporta, 2007). Learning Frontiers' preference to network and 'scale up' reflects Indigenous pluralist approaches to share knowledge broadly rather than storing it up for status and control. Schools were traditionally designed to protect and preserve teaching as a very individualised profession but this school's approach to teaching in the 21st century is based increasingly on different, more collaborative resolutions and teachers who are prepared to work towards 'collective excellence' aspirations and outcomes.

Leadership team members also cited innovations in teacher education as a requirement to support large-scale collaborative reform efforts to engage students in learning that is '*connected, co-created, integrated and personalised'*. The recruitment of teachers who had experienced working in structural and pedagogic reform contexts was considered essential, needing work with the university sector to recruit

people who understand the philosophy of the school and what this school is trying to achieve (TL, T198). The Principal suggested that there was a limited selection of teachers because teacher education lacks opportunities for immersion in diverse and alternative schooling structures that challenge traditional schooling constructs. The Principal cited recruitment experiences of 'High Tech High Schools' in the United States that request that teachers have at least two years' experience in these contexts (P, T275). The school is networking with the university sector to build the capacity of teacher recruits to progress 'student engagement' priorities.

**The new structure**

The new structure is known as the Academy of Innovative Learning and is recognised by the OECD's Innovative Learning Environment project and included among the 120 most innovative schools across 26 countries (Roberts and Owen, 2012). What has been created is

> *…a totally different package of learning …… an integrated curriculum... We threw the timetable out, we threw out the traditional classrooms, so it's an open flexible learning space that the kids designed themselves. There is no timetable for these kids, so they decide when they do their Maths and when they do their English and it's 90% integrated. There's a few bits where it doesn't fit and we learned that trying to force some bits of the curriculum into an integrated unit where it really doesn't fit, the kids soon pick up on the fact that it's not in context, and it's a bit try hard. So there's a few things that we still do standalone, but not many* (Principal, T48).

In terms of structural changes, faculties were identified as one of the major barriers to people working collaboratively,

> *so we scrapped them, we just got rid of them, so we had no Faculty Heads. The Head of Mathematics is now in charge of the year 10 Academy of Innovative Learning (AIL). The Head of English is now the senior leader of year 8 and 9 Academies of Innovative Learning and the portfolios of school leadership have been completely changed because there was a belief that when people are just focused on their own subject area, it stifles collaboration and innovation and teachers become managers of resources, not leaders of genuine teaching and learning for cohorts of students* (P, T166-183).

Leadership observed that when curriculum leaders are made responsible for cohorts of students in sub-schools rather than being responsible for specific disciplines, senior leaders became instruments of cultural change, not mere gatekeepers of knowledge from the specific disciplines. Teachers too were positioned to work more collaboratively and autonomously in teams as a result of the changes.



Another significant structural change included the creation of a junior secondary school divided into four sub-schools, or Academies for year 8, - 10 students. The key aim of each Academy or sub-school is to develop strong professional and student relationships for improved engagement. The structural change included replacing traditional classrooms with 'big picture' 'Academies of Innovative Learning' (AILs); flexible formal and informal learning suites that support interdisciplinary learning. Each learning space is designed and 'owned' by a group of 100-150 students from a year level and a team of six teachers are responsible for the design, implementation and assessment of curriculum. The school's alignment with the 'Big Picture' network of schools also emphasises 'collaboration' and the 'professional learning' of teachers.

At year 10 the school offers *a big picture model* Academy (Expeditionary Learning Academy) where students are required to co-construct their programs of learning with teachers, and each Project Based Learning (PBL) unit includes an off-site or 'expedition' component and a two-day a week internship in an area of interest in the workplace or community. Students also have the option to enrol in at least one year 11 subject and in 2015, 92% of students completed year 11 subjects. Likewise, students in year 11 are able to access year 12 subjects. Big Picture Education Australia (BPEA) focus is about whole school change around design characteristics, including 'one student at a time' approach, student preferences and the personalisation of learning.

The ''learning hub' structure also applies at year 11 and 12. It provides spaces for support from teachers with personalised programs, discussion groups, tutor groups, blended learning environments. The 'hub'

> *supports teachers to deliver content in different ways and more quickly, so students have as much time as is required working on the higher-end problems* (P T1066)
>
> *We're focused on looking at ways to get kids to engage with the content so part of teacher time is spent in front of kids but we've limited that by using a whole blended approach, so the majority of teacher time can be spent 1:1 helping kids, in small groups, or discussion teams* (P, T1072 and T083).

Teachers talked about increased interaction to improve relationships with students as the core ingredient of their reform efforts (TL3, T122).

In 2014 the Principal shared the schools reform agenda and in the local school newsletter wrote about progress since 2011 including visions for the school's future to achieve *'an education worth having'*. The Principal included additional challenges from *'boosting students' digital literacy'* and *'increasing the emphasis on STE(A)M (Science, Technology, Engineering (Arts) and Technology'.* The focus was also about teacher work and teacher knowledge and the importance of *'improving task design to ensure we are providing all students with the opportunity to be intellectually stretched'.* 'STEAM' requires schools to prioritise professional collaboration and integrative synthesis to design learning across subjects. It is also about teachers improving how they design learning; how they design tasks and programs and how teachers understand 'learning design' practices as promoted state-wide as part of STEM professional learning (see Chapter 7: A case study about two schools involvement in STEM professional learning.

A focus on the design of learning in this case study site is a reminder of the complexity of the design process and a work in progress, three years after commencement of the reform process to improve student engagement.

**THE ROLE OF LEADERSHIP IN THE REFORM PROCESS**

The resolution to address student engagement in learning has been inspired by a Principal with the 'reflective capacity and courage to look beyond the 'urgency' of system planned incremental change to the hazier and longer-term task of designing for more complex systemic emergence' (Gonzalez, 2014, p.4). Systemic emergence is described as a 'systems level scaling and diffusion program to increase student engagement in learning' (Learning Frontiers, 2013, p.2). It also encourages teachers to develop less insular education attitudes and encourages, in this instance, collective inquiry.

The capacity of the leadership team to promote a 'less insular' vision has been central to the reforms achieved. Creating networking opportunities with local, national and international education initiatives to progress student engagement has also re-positioned teachers as co-creators and designers of learning where 'collective inquiry' such as reimaging curriculum knowledge collectively is more likely. The commitment by the leadership team at the school to simultaneously support reform initiatives locally as well as advocate for innovation systemically has been



instrumental in providing the impetus and confidence for staff to continue to pursue improved student 'engagement in learning'.

> *All of the change in this state has been one teacher/one classroom stuff, and it doesn't work. It's got to be whole-school and then systemic. So one of the tasks is to work with other schools on this 'Learning Frontier' stuff, and we're just about to expand that network from about 8 schools to about 20 next year (2015). The issue is how we take this to scale across our systems and it's not going to be driven from top down because they haven't got the vision, so again we're doing this without any funding from our department at all, and no building program* (P, T1129).

The Leadership Team is continuously challenged by contradictory tasks: *'implementing the mandates of the current system for the sake of the students and for self-preservation while subversively designing components of new systems more attuned to the needs of these same young people'* (Gonzalez, 2014, p.4). Gonzalez describes such leaders as instinctively understanding emergence and complexity in systems and that they understand that they must act simultaneously 'as hospice workers to dying structures whose utility has largely passed and as midwives to emerging systems whose form is not yet fully defined' (2014, p.11).

The Leadership Team at this site is seeking diverse reform initiatives that fit within reform frameworks developed with their school community while also making sure that mandated reforms are actioned, so students and teachers are not disadvantaged. Leadership voiced concern about being subjected to *'so much scrutiny, any tiny thing that goes wrong is because we're doing something different'* (P, T497).

Ongoing inspection by local education authorities of reforms designed for complex 'systemic emergence' as described by Gonzalez, (2014, p. 4) is problematic for everyone involved in reform efforts and undermines local reform efforts and energy to sustain change. Student engagement reform initiatives are critical across the sector and more likely to be successful and sustainable if other schools trial aspects of the reforms and if supported systemically to do so (Gonzalez, 2014, p.11).

Constant surveillance of 'difference', observed by leadership team members is reflective of the Australian education system, described by Bentley and Cazaly (2015, pp.22-23) as a system that

> works within a largely shared framework for curriculum, professional standards, broad funding criteria and performance measurement that leads to 'a narrow form of excellence [and] excludes many other potentially valuable forms of student achievement.

This includes achievement inspired by individual school reform efforts linked to 'student engagement' and the personalisation of schooling. Research warns that if diversity is not harnessed *to 'support student learning systematically* (which is clearly understood by leadership at this site) *the innovations that are taken up, risk being part of a story of growing inequality'* (Bentley et al 2015, pp.22-23).

Leadership at this school is disheartened by a system that routinely questions a school identified as one of seven public education sites that is part of the 'OECD's Innovative Learning Environments Project' (Roberts and Owen, 2012). The compounding factors that have challenged the reform efforts of the leadership team at this site demonstrate the capacity of leadership that is strengthened by the fact that they are delivering reforms as a response to an agreed 'moral imperative' at the school. Competing leadership priorities also impact on ongoing support for teachers planning and implementing the reforms.

> In New Zealand, a study found that, eight years after major education reforms were introduced, school administrative work had increased substantially and they were working ten hours longer per week on average, than before the reforms. This and other research finds that administrative demands are taking up 34% of school leaders time, clearly competing with educational leadership as their top priority (Schleicher, 2012 p.18).

**Teacher transformation**

The following considers transformation as it relates to both teachers and leaders. For both it has been significant. A teacher provided a historical teacher as designer and creator of program perspective about the complexity of designing learning over time and her final statement summarises how many teachers feel when they choose to take a road less travelled in education contexts.

> *Well I came up through the, 70s, and it was like, sit down for an hour and come up with a unit of work, but that's what it was like, but now, because designing is about looking at learning through all these lenses, it's a massive, a massive huge area of consideration, and our system doesn't pay respect to it.* (TL1, T291).



Teacher transformation as an outcome of the reform journey provides a leadership perspective.

> *I've gone from being insular about what I'm doing here, to thinking about how I can help other people do this same work? That's certainly changed for me* (P, T1196).

This significant epistemological shift by a Principal is a result of questioning, imagining and implementing reforms to engage students in learning through a process that involved teachers in locally driven access to education research of relevance to students and teachers. Teachers were then encouraged to embrace networking opportunities and manage a 'collaborative inquiry initiative about 'student engagement'. This process is noteworthy in terms of supporting education reform both locally and systemically.

Leadership at this site warn perceptions and assumptions that inhibit reform are

> *sometimes only perceived barriers. People often say to me, how on earth do you get away with not having Maths lessons, and not doing this and that? and I go, well, nowhere in the Education Act does it say you've got to have 40 minutes of Maths every day. So, there's a whole stack of perceived barriers I think, that aren't actually there* (P, T10).

Perceived barriers, ambiguities and contradictions provide reason enough for the school to exercise their autonomy to rationalise external reforms on the basis of their relevance to what is happening at the local level. Consequently, it is important to make visible the contradictions that are causing anxiety at the local level, as part of the analysis of the reforms taking place locally.

**ANALYSIS OVERVIEW: CASE STUDY 3**

The Principal and six teachers interviewed at this school responded to the same sets of questions from the perspective of a Principal (P), Teacher Leader (TL), Experienced Teacher (ET) or an Early Career Teacher (ECT).

Teachers interviewed included the Principal, two Teacher Leader (TL) with the responsibility of leading reform efforts over a four-year reform process, two Experienced Teachers (ET) who were team leaders with the responsibility of managing a teaching and learning environment of six teachers and 100-150 students. A Focus Group Discussion (FGD) was also conducted with two early

career teachers (ECT) who worked in the junior secondary Academy of Innovative Learning and also taught senior secondary subjects.

**Contradictions' experienced in a morally imperative reform context**

As Foucault reminds us, power aims at *suppressing contradiction* (1972, p.1), so too collaboration in education contexts, is often an illusion conveyed via assumptions and rhetoric that do not align with the reality of teacher work. Three contradictions have been identified in the transcripts related to teacher efforts to 'engage students in learning' through extensive structural reform and the promotion of 'less insular professional learning and teacher practice'. Firstly, 'working together to plan learning' is often a contradiction in itself because it is rarely achieved sustainably. Leadership team members raised issues about multiple demands to implement both current system directives to ensure students and teachers are not disadvantaged while also implementing reforms at the local level. Similarly, tensions arise between 'planned incremental change' at a systems level versus planning for reform opportunities over the longer term in a local context.

**'Working together' to plan learning is itself a contradiction in many schooling contexts**

> *Planning is a key role, yet planning is often not satisfactorily prioritised compared to, for example, assessment, and there is little time to really plan and the system has never really built its research and development (in this area)*(TL2, 466).

This statement suggests that teachers are resigned to the fact that there is limited interest in teacher planning from a system perspective partly because teachers already try to engage with colleagues professionally regardless of the limited support available and because 'planning' offers a creative challenge personally and professionally.

The fact that 'planning' is often not prioritised suggests that schools are generally not understood seriously as planning organisations' nor teachers understood as planners or creators of curriculum. Teacher Leader 2 observed that, in many other sectors, Research and Development (R&D) usually takes place within existing organisational structures. In education it is generally the focus of a separate authority. Schools have considerable access to social and intellectual resources, yet



they are not routinely part of strategic planning and research as a matter of course. Another Teacher Leader questioned the practice of professional development models that are provided centrally to disseminate and implement policy and research.

> *That T&D stuff doesn't work … that has little or no effect on the system. It's only when you immerse teachers in an alternative environment, for a sufficient length of time, that you will change their behaviour, otherwise they will go back to the default system, which is the textbook, which is about controlling the classroom (TL1, T467).*

This approach to Training and Development also individualises planning, rather than seeking more collaborative solutions. This site, however, has learnt that

> *by collaborating and working together, and coming up with units that engage the kids, rather than using TfEL (local policy direction reform initiative) or the 'Learning to Learn' stuff (earlier version of the States reform agenda), the focus has been, how can we make these units rich learning units, together, and how do we get deeper understanding?* (SL2, T795).

They have recognised the benefits of planning together and are working out ways to try to progress collaborative practices. However in relation to this issue a teacher leader talked about *'STEM science telling us how to best design things*, (ie collaborating to design learning) *but we never really structure it so it can happen and be sustained'* (TL1, T418). So, even though research strongly supports teacher efforts to be collaborative and people talk about the need to collaborate, the paradox is, it just doesn't happen.

Schools also are required to work with multiple and competing demands to implement current system directives to ensure students and teachers are not disadvantaged while also implementing reforms at the local level. Reforms conceived of and implemented locally are usually of minimal consequence from a system's perspective. Conflicting issues arise between 'planned incremental change' at a system level versus planning for reform over the longer term in a local context. The Principal articulated their frustration about the unsustainability of random, professional learning for STEM integration because systems are often locked into *'funded and planned incremental change' rather than a school's longer-term perspective about what is happening locally*'. For example, this school is trying to build a platform for student engagement through professional collaboration that fits with the research of relevance to their community. They are working very hard to

enable teachers to work together across organisational and geographical boundaries of school sites ……. to solve common problems across education' (Bentley and Cazaly, 2015, p.59).

Implementing current system mandates to ensure students and teachers are not disadvantaged while also implementing reforms at the local level places considerable demands on leadership teams and teachers. This school is implementing the mandates of the current system (to ensure students and staff are not disadvantaged) 'while subversively designing components of new systems more attuned to the needs of these same young people'. In this statement Gonzalez (2014, p.4) might have been referring to this site when describing the contradiction of competing, national, state and local reform priorities. The leadership team at this site, who have prioritised local reform decisions based on what they perceive to be a 'moral imperative', is forced into a predicament of simultaneously needing to engage in systemic reform mandates that may complement or conflict with and burden the schools reform priorities in progress.

The school community is attending to these demands in order to change structures and processes that local stakeholders agree are not working. At the same time the school is under quite intense scrutiny and leadership is frequently subjected to questioning tinged with scepticism such as, *"If this is so good how come not everyone is doing it"?*

> *There's a really compelling case for change here but no one is listening. All we hear from the politicians is the back to future politics, ... back to basics as soon as something goes wrong, such as doing more of what hasn't worked and they think it's going to change. It is just crazy* (SL1, T493).

In reference to the school's curriculum integration priority a Teacher Leader emphasised that what they were doing was not an *'or'* process but an *'and'* process: a process that is about reform linked to student engagement and a continuing focus on *'literacy and numeracy and students autonomy over their learning, but people keep having the 'or' argument and miss the 'and'* (TL1, T149).

In this scenario, the 'and' includes integrative synthesis, structural change, less insular networking approaches, as well as delivering the required mandated policy reforms so that students' and teachers' futures are not compromised.



## ANALYSIS

### Teacher claims about professionalism

Teacher claims about professionalism at this site as with other case studies, are aligned with definitions of professionalism provided by Bourke et al (2013). They highlight teacher experiences and claims as members of sub-schools and a school culture that promotes 'less insular' attitudes about professional practice.

**TABLE 5.1**: Assertive Resistance' Claims. Confidence and competence as a reflective practitioner (ie 'openness to new interpretations'

- *Learning is more important than the curriculum. Teachers have to come up with creative ways of covering the content without boring the kids stupid, by filling them up with all of this stuff.* (SL2, T498)
- *It's only when you immerse teachers in an alternative environment, for a sufficient length of time, that you will change behaviours.*
- *To me teaching is based on professional subjectivity, you've got to trust teacher judgment* (TL1, T366).
- *In a traditional setting TfEL (Teaching for Effective Learning SA policy document), was useful for trying things, but to sustain reform it requires feedback from other professionals* (TL1, 515).
- *"The feeling this year is amazing; we've got new teachers and they're part of a team. Even when we've had teachers who were not on board, they still worked collaboratively (TL2, 570).*
- *I've taken the lead on design decisions because I don't have the time to confer. At our year 8 staff meeting we have a chance to talk about this stuff, but they'll more likely to talk about what's happening day-to-day* (FGD, ECT)

> *We've always had a pretty good team in the Academy of Integrated Learning (AIL). Even when we've had teachers who were not on board, they still collaborated, not as enthusiastically as some, but they always worked collaboratively* (TL2, T570).

This observation aligns with research about teacher core capacity to collaborate very effectively (Salonen et al 2015).

TABLE 5.2: Teacher claims about professionalism: 'Aspirational Resistance'. Statements that promote leadership rather than performativity

- *One of the things that we are trying to encourage that we struggled with, is making teachers aware that they all have to be leaders. We can't have teachers who sit back and wait for the coordinator of the space to deal with an issue* (TL2, T590).
- *Intrinsic rewards drive teachers to make change in interdisciplinary design contexts.*
- *Every Monday we meet for an hour or more depending on the intensity of the discussion and the ideas come out. Wednesday for the leadership teams, Tuesday for general staff, so it can get pretty boggy when you get a three-meeting week.*
- *You don't want to get too far into talkfest because you've got to do the do-fest, and so the do-fest has to be planned for as well* (TL1, T389).
- *This is one of the rare opportunities that we actually get to work with private schools, and that's been great.*
- *No matter what school you put me in, I'll always be looking at where the challenges are and how to make them better* (L1, T1141).

Despite reform efforts, early career teachers talked about being overwhelmed by SACE planning requirements, which meant planning for year 9 and 10 was minimal as a result of time spent planning for students in the senior years. *'We constantly get distracted with… behaviour issues and it just doesn't happen'* (ECT2, 174). In contrast, experienced teacher claims reflect 'confidence as practitioner'.

Teacher claims about changes in practice

Teacher claims about changes in practice related to teacher 'knowing, being and doing' (Martin et al, 2003) and teacher capacity to collaborate are represented in Table 5.3. There was general consensus about improving student engagement but lack of 'time' to engage with the reform agenda was a barrier, especially for early career teachers. New learning for teachers was evident in claims teachers made about the schools focus on improving teacher knowledge and school structures that enabled learning that is 'connected, co-created, integrated and personalised' (Learning Frontiers, 2013, p.1).



**TABLE 5.3:** Teacher claims about changes in practice (teacher knowing, being and doing and capacity to collaborate)

- We've learnt by collaborating and working together, and coming up with units that engage the kids, rather than TfEL, the learning to learn stuff. Our focus has been, how can we make these units rich learning units, and get deeper understanding (TL2 795).
- It's respect, that common and collegiate respect. We get together and look at the commonalities across subjects and ask the questions. What was working in Maths, what was working in your area in Literacy, and would you advocate that across all subjects and why? (ET 2,T720).
- When you're working collaboratively, you see somebody deal with a student in a different way that affects the way we interact with a student (ET 1, T481).
- We're not good at the reflection stuff because we're always doing and going on to the next bit. So, things we really want to work on next year is (1) getting greater reflection. The second one is archiving our stuff in a way other schools would find useful, but finding the time is really tough (TL1, T647).
- If you've all sat down and written that curriculum, you all want to make it work. You all have that vested interest in making it work.
- What we are doing is a step in the right direction, but you need set instructional time and then blocks of time too (ECT2, T 60).

**Teacher claims about 'core capacity to collaborate'**

Teachers identified that school improvement was often the result of teachers collaborating to design learning. This is evident in statements teachers have chosen to use to describe their core capacity to collaborate including a statement about 'collaboration, making teachers think differently' and 'being valued' for the contributions teachers are able to make in collaborative design contexts. See (TABLE 5.4 below). This teacher stated

'when designing learning collaboratively the learning experience makes you think differently and my ideas are of value amongst other staff' (ET2, T709).

**TABLE 5.4: Teacher claims about core capacity to collaborate effectively**

| |
|---|
| - *When designing learning collaboratively the learning experience makes you think differently* (ET,2, T709). |
| - *It's the collaboration that I agree with. Like I was saying before, my ability to teach in other subject areas to learn from other teachers, especially as a first-year teacher, I don't spend much time with the other teachers, but when I do, I'm learning heaps* (ECT V, T1012). |
| - *When you're working collaboratively it's respect, that common and collegiate respect that makes the difference.* |
| - *The collaborative classroom is not just for kids. A collaborative classroom is for teachers too. When you see other teachers (in these contexts), it's a really powerful thing* (ECT 1, T495). |
| - *There's that real sense, a collective passion that motivates. Gives you a reason to get on with it* (ECT 2, T807). |

Additionally, phrases such as '*vested interest in making it work'*, '*getting greater reflection' (time) with others*, *'archiving our stuff'* (programs created) so others can learn from previous generations of teachers. *'Collaborating makes you see others (actions) differently'*, Implying that teachers learn from other teachers knowledge and skills. *'Its respect, that common and collegiate respect',* Respect for what others bring to planning, teaching and learning that ultimately transforms how teachers practice.

**Professional autonomy of teachers to improve student engagement**

Facilitating the professionalism of teachers at this school included five key professional collaboration reforms; extensive structural change that included changes to the way space is used and how teachers use that space; implementation of integrative synthesis processes and co-constructing learning with other teachers and increasingly with students. Most significantly, extensive networking opportunities were undertaken by teachers nationally and internationally to build knowledge, and networks. The aim was for teachers to lead reform efforts as members of sub-schools that included a focus on personalised learning, mentoring and small group work provisions for students.

Reforms at this site demanded a shift in curriculum thinking and planning and greater curriculum and pedagogical autonomy, which included the creation of autonomous



sub-schools of approximately six teachers for one hundred students. The reforms have created complex challenges for those wanting to foster greater teacher autonomy and teacher control over curriculum creation. As with the previous site, teacher claims about teacher autonomy are aligned with Mausethagen et al's two dimensions of professional autonomy: Teacher 'will and capacity to justify and develop core practices' and teacher 'will and capacity for self-governance' (2015).

Mausethagen et al. (2015) also identify three prominent perspectives of teacher autonomy: *'pedagogical freedom and absence of control'*, (2) *'the will and capacity to justify practices'* and (3) '*local responsibility'.* Teachers in this site are working towards each of these perspectives and Teacher Leader statements in the table below suggest that they have not yet fully embraced 'pedagogical freedom and absence of control' elements required in a school culture with a focus on curriculum autonomy. A sub-school teacher leader at this school talked about

> *balancing teacher workloads so it is equitable for all* (ET 2, 659) and *allocating people to work in and manage a space of approximately 100 students, as learning professionals rather than teachers* and *"delegating without looking like you're dumping on people* (TL2, 805-826).

**TABLE 5.5:** Professional autonomy claims (the will and capacity to justify and develop core practices

**TABLE: Teacher claims about Professional Autonomy:**

**( 'the 'will and capacity to justify and develop core practices')**

- *If you're carrying people that don't see their professional obligations this can impact. In the early days we'd get teachers saying, 'I don't do holidays'! Some teachers felt no professional obligation to join their peers.*
- *Students that have finished their tasks early and even, without prompting them, they are helping other students. That's something that I'm quite proud of and its quality help they're giving.*

***'the will and capacity for self-governance'.***

- *We all need to own this, but we still get staff that stand back and go, 'working in this space is pretty easy, isn't it? and teachers not prepared to do what was agreed; that's the hard stuff. It's balancing out the workload that makes it fair and equitable. That can be quite tricky (TL2, T659).*
- *It's complex in the sense of when you allocate people to being in a space, to manage a space, as a learning professional as opposed to a teacher, we become experts in learning.*
- *Structurally, it's easy to set up, but then it's how you deliver who's responsible and how much a person is responsible for assessment, and who's responsible for numeracy and literacy? Deciding how the work balance is done, is much more complex. It's wanting people to step up (TL2, 805-826).*

A focus on what could be called 'performative' issues rather than 'leadership' issues reflects the complexity of the task of supporting teachers to work autonomously, collectively. Retreating to a focus on performative issues for control of a situation I is a trigger for opposition to education reforms and early career teachers in this instance provide a valuable and contrasting perspective to experienced teachers' perspectives. For example, an early career teacher consistently identified *'the need for time'* and *'we do not have that time'.* However this teacher remained optimistic and kept thinking, '*Monday night I'll share it, and everyone will know,* (what she had planned so far) *but, it's not the case, we constantly get distracted and it just doesn't happen'* (ECT 1, 173).



Structural reforms and networking at this site has helped to motivate teachers to collaborate and engage in ongoing discourses as members of sub-school teams that support teacher '*capacity and confidence to justify and develop core practices'* locally. This same early career teacher stated

> *The collaborative classroom is not just for the kids but a collaborative classroom is also for teachers. When teachers see other teachers,* (teach) *it's a really powerful thing* (ET1 495).

There is also little doubt about teacher willingness to collaborate, share and contest knowledge at this site. Teachers talked about '*when designing learning collaboratively the learning experience makes you think differently. 'My ideas are of value amongst other staff'* (ET,2, 709) and *'It's the collaboration that I agree with, my ability to teach in other subject areas, to learn from other teachers, especially as a first-year teacher, I'm learning heaps'* (ECT, 1012). *'We've learnt by collaborating and working together and coming up with units that engage the kids. Our focus has been, how can we make these units rich learning units, and get deeper understanding'?* (TL2, T795). Statements that reflect *'the will and capacity for self-governance'* or teachers *'finding their voice within autonomous teams'* however, are minimal. Many statements were about accountability and what teachers needed to do as members of autonomous teams. This included teachers '*needing to own the programs collectively' and 'teachers needing to recognise professional obligations'.* Teacher 'capacity' for self-governance is an essential component of structural reform, but is not strongly evident in statements made. This could be due to the fact that four of the six people interviewed were teacher leaders responsible for implemented rather than teachers in fulltime teaching roles.

**Metaphors teachers choose to describe their experiences of designing learning collaboratively**

The metaphors and associated imagery presented in Table 5.6 below provide perspectives about *'what the process of planning learning across the disciplines is like'* in a school with a focus on student engagement and structural reform.

**Table 5.6:** Metaphors: about what collaborating to plan learning is like in a site with a focus on student engagement

- '***Massive Synergy':*** *The experienced teacher explained " When it's going really well there's synergy there, there's massive synergy and its where genuine educators want to be, in that space. This whole process becomes multi-dimensional, you see your peers in a different light, and you see them with the complexity of the human spirit. You dismantle this idea, he's a maths teacher, he's an art teacher so there is that interchange of ideas to try and design it and you take that enthusiasm to the kids"* (ET 1, 552, 565)
- ***Growth, growth. It's really organic****. The experienced teacher explained it's, I feel like, I feel like we do hit that personalisation really well,* (ET 2, 548).
- ***Like Finding Nemo*** *… The early career teacher explained, all the fish are just panicking, and going in all directions,.... like a giant school of fish that you just can't control. No, come on, not that, no, over here, that's what I feel like* (ECT, T786).
- ***Like being a mum*** *The early career teacher explained you have to be a master of all trades* (ECT L, 758)
- ***It's like a dream****….I have this dream that the kids go through it and it really works for them, and for some it does now, but (in my dream) it works for all of them, for the strugglers, for the ones that, I'm going to the toilet, Miss, and you see them four hours later in Jean's office. I have this dream* (FGD, ECT).

The process is described by an ECT1, as a place where

*'genuine educators seek to be and where teachers see their peers in a different light'*; and its also where teachers can try on different behaviours and ways of being an educator. Similarly, the Aboriginal principle about the meeting of opposites, results in seeing things differently: new creation rather than conflict and destruction. This applies equally to collaboration contexts where teachers 'see their peers in a different light' and see and experience how knowledge from across the disciplines can be de-constructed, re-constructed, and re-imagined. 'Tension and balance between opposites is the source of both new creation and social cohesion' (Yunkaporta, 2007, n.p.) including in collaborative design planning contexts.



**SUMMARY**

This site has positioned itself at the interface of planning learning by building not just bridges but highways to 'systemic emergence' of an integrated curriculum vision that enables professional collaboration opportunities to challenge teachers' traditionally held beliefs about planning teaching and learning.

The question about who in a school community may experience autonomy (Wermke and Salokangas, 2015, p.3) has fundamental implications for the ways in which a school operates. School-based leadership in this case study site is asking teams of teachers and their students to be more autonomous particularly in relation to decision making about curriculum content. This is consistent with PISA research findings about autonomy in schools that concluded

> Autonomy reforms improve student achievement in developed countries but undermine it in developing countries. Increased autonomy over academic content, personnel, and budgets exerts positive effects on student achievement and are most pronounced in decision-making on academic content (Hanushek, Link, and Woessmann, 2013, p227).

Teacher claims suggest there is some resistance to greater autonomy in this site but there is also momentum such that teachers will adjust to the scope of reforms that include teacher autonomy to 'liberate professional practice around innovation' to better engage students in their learning (Gonzalez, 2014, p.11).

As curriculum integration intensifies, new responsibilities for teachers will emerge which demand greater autonomy. This study suggests, that given the increasing complexity of teacher work in interdisciplinary planning contexts, it is inevitable teachers will increasingly need to collaborate. This alone necessitates greater support for teacher autonomy resolutions at school and system levels.

# CHAPTER 6

## KEY CASE STUDY 4: 'STUDENT WELL-BEING, AN INSPIRATION TO COLLABORATE

### SCHOOL CONTEXT

This case study site is a senior secondary school (Years 10-13) that caters for students from over 80 different countries who speak 55 different languages including students who have come to Australia under humanitarian / refugee programs. The College draws its students from all parts of the greater metropolitan area and is not aligned with specific feeder schools so students rarely come from the same school or know one another. Enrolments have been stable since 2011, with approximately 1000 FTEs each year. Students are generally over 16 years of age, many are part-time and all are working to complete the South Australian Certificate of Education (SACE).

A key driver shaping teaching methodologies is all teachers are identified as teachers of literacy, to support all learners. There is a focus too on assessment task design, empowering learners, wellbeing for learning and a broad range of curriculum offerings. Subject delivery, content and support structures are designed flexibly to enable all learners to achieve the SACE. Subjects are offered at various levels to cater for the widest range of learning needs and Integrated Programs are developed in which teachers work cooperatively to support specific cohorts of students. Key Staff outcomes include a focus on increasing teaching and learning 'improvement strategies'.

The school has four key priorities; 'quality teaching and learning' that includes developing shifts in practice to improve learning outcomes for students, 'Connection and engagement' to support student health, wellbeing and school engagement. 'Entrepreneurship and partnership' priorities include the development of student capacity in communication and collaboration and 'Better futures' objectives include



integration of the AC capabilities into teaching and learning programs and identifying new learning opportunities for current and future students (adapted from the schools Context Statement).

> *Our community comes from one end of the city to the other; we don't just service the kids in this area. Students are able to come to us from any school if they can't get the curriculum that they need, so we get lots of kids coming to do twilight lessons and we help other schools by offering subjects they might not be able to offer, Specialist Math, some Sciences. A lot of private schools send their kids here. It's really expensive to run a class for five kids, but if you send five kids here, that's quite cheap for them* (P, T818).
>
> *We are working with students who are generally educationally disadvantaged, not always because of poverty or culturally and linguistically diverse backgrounds, but because the mainstream system hasn't worked for them. We get kids from private schools, from public schools, from really good schools, but for whatever reason it hasn't worked for them, they come here having suffered some kind of issue, and so we're having to repair the emotional well-being of the students, as well as trying to improve their academic outcomes* (P, T818).

### STUDENT WELL-BEING & DESIGNING LEARNING

'Student well-being' and a strong 'relationships-based approach' to designing, teaching and learning' using integrated approaches is promoted and supported comprehensively in this site. The Principal explained that the

> *well-being' of students and 'strong relationship' norms need to be firmly embedded in everybody's brain about how it works in a complex school and that all students need to be on board about the fact that they're not buckets that we're going to fill. They are going to be active participants in the learning* (P, T652).

A key teacher priority at the school is to be an active participant in curriculum reform initiatives. Teachers are encouraged to identify socially isolated students who require additional support other than existing arrangements that include students remaining with the same group of students whilst participating in shared learning experiences in a broad range of curriculum options. Observing the gaps in student learning and collaborating with others to design Integrated Program options that support each student to complete the SACE are also encouraged. The Integrated Program enables schools to vary their delivery of whole subjects by combining two or more whole Board-accredited subjects in a single teaching and learning program' that makes use of the flexibility in subject outlines, where content and/or the school assessment components may be varied (SACE Board website, Guidelines for the development of Local and Integrated Programs).

There is general staff consensus that teachers work towards a common vision about achieving well-being student outcomes. This is in addition to a focus on the 'General Capabilities' outlined in the Australian Curriculum that includes Literacy, Numeracy, Information Communication Technology, Critical and Creative thinking, Personal and Social, Ethical and Intercultural understanding which are addressed through the learning areas 'to promote student wellbeing, safety and positive relationships so students can reach their full potential' (See Figure 1, Dimensions of the Australian Curriculum, p22)

In this school there is also a strong belief and articulation of teacher capacity to create and staff consensus that 'teachers have the capacity to observe the gaps in student learning to create alternative learning programs' that include well-being objectives. As a result, teachers, for over a decade, have been designing learning together within agreed well-being frameworks that include a shared recognition that *'it's the well-being [of students] that comes first'. It is the explicit philosophy: the thinking that is modelled that includes a 'really strong 'relationships-based approach to learning that underpins our cross-disciplinary approach and the subsequent integrated learning packages created'* according to the Principal (T117). The well-being vision appears to have contributed to teacher resolve to create an holistic and connected learning experience for and with colleagues and with students.

Messages about the role of curriculum impacting on student wellbeing have resonated with staff and are reflected in the diversity of curriculum options available. Teachers' design learning with well-being outcomes in mind, including knowledge, understanding and skills students can use to make healthier and safer choices. Clarity around a definition of a well-being culture is in progress through discourse evident in the Principal's statements above. This progress is also reflected in the discussions about 'fostering respectful working relationships', 'Well-being curriculum design features', teacher learning as a social process', readiness to problem solve, respect, cross generational planning, seen in the sections that follow.

**Encouraging respectful working relationships and practices**

Encouraging and fostering respectful working relationships and practices in a 'well-being culture' is treated as core practice at this site. The 'Integrated Program' model is not just about helping teachers and their students make connections between the



disciplines to forge new ways of thinking, planning, teaching and learning. Knowledge sharing also fosters deep relationships between teachers and with students *'to encourage and foster respect'* (Hulme and Toye, 2006, p.9). Respect for teacher knowledge and their *"gut feelings for what may work"* (SL, 427) provides the impetus for teachers to continue to explore interdisciplinary learning possibilities as well as work collaboratively and respectfully to design learning.

This study recognises the role of 'values' in reform contexts and reflects on the lived values familiar to Aboriginal and Torres Strait Islander (ATSI) peoples. Values that help tell the stories about teachers designing learning collaboratively. For example, 'respect' at this site is reinforced by and in turn strengthens respectful relationships that encourage teachers to trust in a design process. From an Aboriginal values perspective, this process could be understood as a process that 'promotes dignity and recognition' (that in turn helps to 'increase the effectiveness of a group' (Levin et al 2008, p295). Teacher 'value systems' are intrinsic to collaborative design practices and should be applauded and not ignored in discourses to develop teacher capacity to collaborate. The well-being philosophy at the school is allied strongly with teacher value systems that include the development of long-term collaborative and respectful working relationships to design Integrated Program options.

**Well-being curriculum design considerations**

Curriculum design elements that link to the development of a 'well-being culture' include for example, 'intensive support for recent arrivals and students learning English 'and 'Learning support and preparatory programs at all levels and in all curriculum areas to facilitate student transitions to further study, workplace and community life'. These are obvious examples, but at this site, 'well-being' is the culture of the school and 'Wellbeing for Learning Strategies' are named and articulated and understood collectively. For example, the strategy 'Subject Delivery, Content and Support Structures support learning to be designed flexibly to enable learners to achieve the SACE. This includes, subjects that are offered at various levels to cater for the widest range of learning needs. This is a demanding objective but it explains some of the 'how' this can be achieved. For example, teachers are encouraged to observe gaps in student learning and achievement and create Integrated Programs cooperatively, to support specific cohorts of students. To

ensure there is support to achieve these objectives a key strategy outlined in the school context statement includes a focus on increasing teaching and learning 'improvement strategies'. So it seems teachers are not being left entirely on their own. There appears to be interconnected ways of being, knowing and doing teacher work to create and support a 'well-being' space in which to plan, teach and learn.

The range of innovative curriculum offerings in this school has resulted in the school being nominated as a Leading SACE Improvement site that included an invitation to deliver professional learning statewide. The school's context statement stated

> *SACE results have continued to improve over the last 5 years due to a range of strategies including early intervention through the first task analysis; targeted in class and out of class support; the use of volunteers to support student learning; the development of a homework club and research project club and professional development for staff in supporting students' literacy and assessment task design.*

Of particular relevance to this study is the inclusion of 'Integrated Learning Packages' in improving SACE results with 'students engaging in Integrated Programs, achieving higher levels of completion than is the average for the site' (School Annual Report, 2015).

This site has fashioned an integrated curriculum approach that consistently demonstrates what research has shown elsewhere, that

> students in Integrated Programs demonstrate academic performance equal to, or better than, students in discipline-based programs. In addition, students are more engaged in school, and less prone to attendance and behaviour problems (Drake and Reid, 2010, p.1)

Academic outcomes based on local data and local interpretation of data, show the outcomes of the well-being culture is achieving positive SACE outcomes despite the design complexities involved for teachers creating 'new' learning opportunities for groups of students. Teacher awareness of support from colleagues and the school's well-being priorities drives the 'actions' imagined. An early career teacher stated

> *Interdisciplinarity here is ... for the teacher to have that high-level involvement in planning the course, based on student needs, based on what's happening currently in the world, whichever subject it is, and having that sense of ownership and tailoring that makes it so much easier to teach and that makes education easy* (Focus Group (FGD, ECT, T650).

The identification of well-being issues and imagined integration possibilities provoke 'collective understandings' and provide a certain urgency and motivation to get the



work done. Designing learning linked to well-being concerns provides the impetus for teachers to design learning about the interests, 'issues and concerns posed by life itself' (Beane, 1995, p.616) which reflects the intent of the Integrated Programs created at this site.

**CAPACITY BUILDING**

Capacity Building that relates to the development of a well-being school culture at this school has been fostered through a number of key actions described under the headings of teacher learning, teacher readiness to solve problems, respect and cross generational planning and protocols, discussed below.

**Teacher learning as a social process**

'Knowing deeply that teacher learning is a social process sustained by relationships and trust' (Fielding, Bragg, Cunningham, Eraut, Gillinson, Horne, Robinson and Thorp, 2005, p5), 'yes' responses by site leaders to teacher-led curriculum resolutions, deconstruction and reconstruction of content into integrated packages of learning within well-being frameworks have all been sustained by sharing knowledge across generations of teachers. Gilbert, as part of the 'professional learning flagship program' for the implementation of the Australian Curriculum 2012-2016, argues

> educational reform's progress depends on teachers' individual and collective capacity and its link with school-wide capacity for promoting pupils' learning. Building capacity is therefore critical… and is a complex blend of motivation, skill, positive learning, organisational conditions and culture and infrastructure of support. Put together, it gives individuals, groups, whole school communities and school systems the power to get involved in and sustain learning over time (Gilbert, 2011, p.17).

School Leaders at this site in respecting the capacity of teachers to identify curriculum possibilities, engender 'the power (of teachers) to get involved', and this builds capacity. A leadership team committed to *'a bias to say YES'* to teacher-initiated education resolutions (P, T410) expresses their confidence and respect for teacher knowledge, including tacit knowledge and teacher *'gut feelings for what may work'* (P, T427).

> *So, if someone says, I'd like to do this, we don't start from the position of, these are all the reasons it won't work; it's like, yes, work out how … and then come back with a proposal…. You can't have curriculum innovation if you're going to say no to everything; you've got to let people imagine the possibilities* (P, 412-415).

In education reform contexts, teacher tacit cultural knowingness about what works is described by Polanyi (1966) as 'cultural understandings that ground social performance and capacity to communicate' (in Moen, Mørch and Paavola, 2012). In schooling contexts, tacit knowledge is rarely embraced for decision making purposes. The potential of this form of knowledge is realised in this school where leadership has actually stated that there is a *'bias to say yes'* to teachers' gut feelings about what could work. In this way, teachers' 'tacit knowledge' and their 'capacity to communicate and collaborate' are helping to drive curriculum renewal at this site. Teachers 'can know more than we can tell' (Polanyi 1958, 1966, in Moen et al., p.4) and teachers' ways of knowing: their 'tacit knowledge'; 'personal experiences, tastes, practices, involvement are central aspects of human knowledge, especially when something new is created' (Moen et al., 2012, p.33). This leadership team demonstrates awareness of the potential of applying knowledge creation models that recognises 'weaker' forms of knowledge (Polanyi in Moen et al., 2012, p.35). As an example, 'teachers observing the gaps in curriculum' with site leaders then acting on this knowledge by making it explicit in meaningful ways, is motivating for all concerned.

Teacher ideas and observations while central to curriculum resolutions and practice, are overlooked in many schools, but in this site are central in sustaining curriculum innovation. The Principal expressed confidence in small teams of teachers having the autonomy to create and recreate integrated packages of learning to build and maintain collective curriculum thinking momentum to produce strong student learning outcomes. Confidence in teacher capacity at this site is well placed, and in 2015, 95% of students engaging in the four SACE integrated packages available successfully completed the SACE (FGD, T970, and 2015 School Report).

**Readiness to problem solve**

*'Being prepared to problem solve around an Integrated Program decision, without thinking about all the structures that you've got in place that are going to stop it happening'* (P, T895) helps build teacher capacity to collaborate. Once a decision to embrace a more integrated curriculum has been made, site leaders suggest that it is imperative to problem-solve around schooling structures and processes to support integrated approaches. The Principal talked about problem solving through



confidence in the capacity of teachers to collaborate as well as providing access for teachers to networks and support services partnerships that have resulted, for example, in teaching small groups of students from other sites, where it was not affordable for the school to offer classes. This strategy has resulted in the development of Integrated Programs with the Health sector as part of a partnership arrangement with the University sector to unravel key well-being issues identified by teachers at the school.

Schleicher would concur and his descriptions of 'developing school leaders for the 21st century' identified the need for leaders to develop and engage with problem-solving strategies 'through concentrated processes of communication and collective learning' (OECD, 2011, p.22) at the local level. This is evident across this school, with teachers increasingly taking the lead in identifying well-being issues and possible integrated curriculum resolutions. For example, as part of the school's approach to 'problem solving' about the retention rates of year 11 female students, leaders observed that as a school they were not well positioned to deal with the thinking required to solve this problem. Consequently, the school *'entered into a partnership with Flinders University where they send us Social Work students for 500 hours a semester, and we give them an inquiry-based project around a student issue that's upsetting us at that moment, or not working for us. So, we have two or three students per semester for 500 hours doing research around what's happening with the students, in a particular focus area'.*

The insights gathered from teacher-identified issues and school-based research, supported by school leaders willing to explore the details and follow through with actions, provide the impetus for teachers to continue the well-being momentum within a well-defined well-being framework.

**Respect**

Respect for teacher knowledge and professional experience and listening to teachers' *"gut feelings for what may work"* (P, T427) is active at this site. Leadership respects the capacity of teachers to lead curriculum reform at the local level as active participants in observing, imagining and planning the implementation of 'Integrated Packages'. Consequently, integrated packages are increasingly chosen by students

at this site and have secured a strong curriculum presence amongst traditional senior secondary curriculum offerings. Presenting more interconnected and holistic packages of learning has provided students with a level of clarity about content and assessment expectations perhaps not achieved when presenting students with overviews of five seemingly disparate subjects, three of which need to be achieved at a 'C' level or higher to achieve the SACE.

**Cross-generational planning**

There is also strong support for cross-generational planning, including for example, for the 'ATAR Integrated Program', conceptualised from Stage 2 SACE subjects to support students to achieve an Australian Tertiary Admissions result. The Principal explained

> *We've got two very early-career teachers, and two mid-career teachers, and one late-career teacher so there's a spread working on this program. Same with the 'SACE Completion program', and the same with 'Community Services package': they're all cross-generational groups of teachers planning and implementing the learning. Everyone has something to offer, everyone* (P, T242).

Cross-generational planning perspectives provide both mentoring and coaching and curriculum renewal opportunities.

> *It's very powerful in terms of the succession planning, to have the really experienced, fabulous performers working with brand new teachers who are also really good performers, who ask 'why don't we do it like this? Why don't we do it like that?' They'll throw out challenges, and so everybody has something to win from this. And then, because they're working as a group, there's no kind of shame about walking into each other's classrooms, it's a completely open classroom, so that the students can spill out and work in groups outside. That's the way we model it* (P, T256).

Retention of staff at the school is also strong, with retention of staff a feature of the school, as noted earlier. The Principal stated that for teachers designing the integrated packages

> *you do need to have the right team of teachers because they meet, they plan, they moderate their work together, they do case management of the students together and because they see the benefits of working together. Quite apart from education outcomes, it's the structural things that become easier, so if a teacher has got something on, they swap lessons.... If someone is away, the others all know what's happening so the students don't ever feel that there's a disruption to their program* (SL, T244-257).



**Protocols**

Another factor contributing to a collaborative well-being culture and the creation of Integrated Programs is the elaboration of essential protocols to make it happen, including protocols associated with the use of time. "*Time for teachers to fully understand the curriculum that they're working with; time to imagine the opportunities within it; and time to be creative in how that's going to be planned and implemented"* (P, T645). The experience of one of the teachers in the Group Discussion was *"we don't get specific time to plan collaboratively… we don't get that, but we probably spend almost that amount of time (2hrs per week) chatting to each other informally"* (Group Discussion (GD), T215). Time is a limited resource in schools, but especially needed when new staff may have been co-opted into existing Integrated Programs. Despite the capacity building efforts of the leadership team, barriers such as 'time' remain a constant reminder of the effort required.

At this school '*all of our teachers have curriculum development time* (a lesson a week), *because we're trying to encourage people to work together around a specific focus'* (P, T227). A lesson a week is minimal, but it represents a designated space for teachers to *collaborate* to share knowledge and make decisions about learning and as a consequence the discourses have shifted from *'a lack of time'* to *'how good it is to be able to learn from each other' (GD, 980)* as part of *'that re-prioritising and teaching and working together'* required to design an Integrated Program (GD, 285).

Making time also inevitably involves reconciling the timetable and, at this school, the timetable structures and systems that have evolved are based on 'trends observed' which have their genesis in a focus on well-being. The Principal explained

> *in a normal high school, the students choose subjects, and the timetable system produces a timetable, and then the students who don't fit are re-counselled. What we're working on here is a fixed timetable system based on trends that we're observing. We know that kids pick similar groups of subjects, so we were doing packages before packages even became a thing, because kids would pick particular subjects. Our timetable is set up around making the packages (Integrated Programs) work, and students can actually choose outside of their year level, outside of their achievement level, because we've lined up the subjects so that you can do that* (P, T904-928).

The Principal suggested, because the school is a senior secondary school, it means that the faculty

> *silos are not quite so thickly walled, and we give people time'* (P, T372). *You actually have to put the time into curriculum development and into the collaborative work of teachers* (P, T377).

The decisions the school is making strongly reflect current research '*around teachers having that time to work together'* (P, 381). So, the culture of well-being that has evolved is supported by a leadership team with a very deep respect for the capacity of teachers to work together to create curriculum resolutions for groups of students not quite making it in more mainstream schools.

In summary, in relation to teacher learning as a social process, broad-based leadership support to build teacher capacity and a collaborative culture is evident at this site and includes, *'leadership response to teacher identified student well-being issues'*; '*leadership preparedness to problem solve around the implementation of an 'Integrated Program and 'decision making without thinking about all the structures that you've got in place that are going to stop it happening'*. Cross-generational planning was also identified as a capacity building strategy and listening and actioning 'teachers gut feelings' for what programs of learning may work for students' helps to acknowledge teacher 'knowing'. Leadership *'elaboration of essential protocols and structures to encourage collaborative planning, including teacher time to understand, imagine and plan'* are affirming of teacher practice and development of teacher as creator and schools as knowledge creation organisations.

**PROCESSES, PRACTICES AND PRODUCTS OF INTEGRATION**

Teachers participating in designing integrated packages come from diverse academic and career backgrounds, often with experience in teaching a broad range of subjects and are *'happy to try a whole range of things'* (P, T284). Teachers either volunteer, self-identify or are members of the leadership team that identifies teachers who may be able to contribute knowledge for a specific program. *'So we mentor some people up as well'* (P, T220).

To strengthen leadership capacity and to help drive curriculum reform, some teachers are trained as coaches to mentor colleagues to strengthen the learning culture and achieve a consistency of cultural norms as reported in the 2015 School Annual Report: *'All of our teachers have that curriculum development time, because we're trying to encourage all teachers to work together around a student well-being*



*and a relationship focus'* (P, T227). The Principal emphasised that re-thinking and co-reconstructing the curriculum requires an enormous amount of time and energy and, on average, from conception to implementation, it takes about two years to develop an 'integrated package', illustrating the complexity of the integration design process at the local level. To cater for this the school buys-in time release to develop the focus and content across subjects to be included in the programs; what is going to be assessed and structurally what needs to change to manage implementation as well as manage the underlying principles around culture and restorative practices at this site.

> *The teachers focus very much on the curriculum and making sure it is integrated* (P, T295).

Integration makes connections across the disciplines but, as in most senior secondary contexts, the original disciplines basically remain intact because of SACE assessment requirements. Teachers talked positively about Interdisciplinary design and their understanding about well-being from an individual and collective teacher perspectives and their approach to design as a result of this dual focus on the individual and the collective. Something similar perhaps to the UNESCO, four pillars of learning about *'learning to learn', 'learning to do', 'learning to live together', and 'learning to be'* (UNESCO, 2014, p11) Interdisciplinarity at this school

> is not centred in content. Rather critical thinking is at the core and a solution to a problem viewed from many perspectives'. This allows teachers 'the opportunity to make new discoveries, design new methodologies and challenge … assumptions and traditional ways of knowing (Long et al., 2010, p.47).

The teachers interviewed for this study were predominantly from the social sciences but increasingly teachers involved represent the sciences, especially given the focus on improving STEM outcomes at the school through integrated planning approaches.

> *There is a teacher who started life as a scientist, a geologist, and is now teaching physics. She teaches general science to our 'Building boys' (a SACE package) and also teaches health and nutrition, and an amazing young teacher who's just happy to try a whole range of things* (SL, T283).

The nutrition teacher trained as a lawyer to begin with and is a humanities and community studies teacher now. Another teacher

> *was a home economics and English as a second language teacher and has a strong interest in Work Education (SL, 267) and, then there is a teacher who is a business studies and Information processes and publishing teacher and she's really great at Multi Media* (P, T269).

To complement the broad teaching experience of teachers designing 'Integrated Programs', the school is committed to the development of teachers through engaging in creative collaboration design opportunities within the school and with other schools and the university sector.

In the Finnish system, there is strong evidence about the significance or teachers professional discretion and independence to decide what they will teach and how' (OECD, 2010, p.123). This planning approach contributes to stronger PISA outcomes for 15-year-old Finnish students compared to 15-year-old students in Australia, in reading, mathematics and science literacy. To achieve these outcomes, Finnish teachers teach four 45 minute lessons a day compared to Australian teachers who teach on average six lessons of 50 minutes a day. So, while Australian teachers teach, it can be assumed perhaps that Finnish teachers 'plan' as part of designated and recognised responsibilities for curriculum creation, including the

> discretion to interpret curriculum frameworks, select their own textbooks and other curriculum materials, and then design their own lessons, all of which require time. In some schools the process of curriculum development is undertaken collaboratively by teams of teachers (OECD, 2010, p.126).

This statement reflects what the case study sites are trying to do and where it differs perhaps is in relation to teacher collective autonomy issues, as well as perceptions about teacher identity and the perception about the role of teacher as creators of curriculum. The dilemma for site leaders is about the extent of the changes necessary. This study suggests the domains of teacher professionalism offer natural boundaries for consideration about how best for teachers to plan learning in local contexts.

**Collective autonomy**

Collective autonomy invites teachers to explore the infinite potential of the 'Integrated Program' as an important driver of capacity building and structural change. The Principal stated; *"there is an opportunity to develop and use the structures that we*



*have through SACE subjects, and through VET programs to develop packages that cater for students with specific needs and interests"* (P, T59). Making the most of the subject options available in the SACE includes integrating and rearranging the various layers of content knowledge, subject specific skills, subject design criteria, performance standards and capabilities that need to be considered when designing learning across subjects (and also for each subject, for assessment purposes). These layers are multiple in an integrated design context where teachers with expert knowledge in specific subjects take personal risks to engage in rigorous integrative design discourses on behalf of the 'well-being' needs of specific groups of students.

The process of integration to design learning itself provides many of the key features and conditions for capacity building and successful professional learning as identified by Gilbert. The features include teachers

> responding to participants' aspirations'; engaging participants in collaboration; investigations into own setting; engaging participants in critical reflection and challenging assumptions; establishing clear, shared understandings of purpose; be a long term process that ensures high quality design and delivery (resources, organisational support); relevance to and compatibility with context and including both theory and content and information about alternative practices (Gilbert 2011, pp.10-12).

These features are reflected in the work of teachers in this school. For example, to advance critical thinking skills the 'United Nations Peace Education Curricula' at this school is mandatory and asks students and teachers, like Andreotti, to consider *'the connections between language, knowledge, power and subjectivities'* (Andreotti, 2007, p.1).

Staff at this school have responded positively to the 'capacity building' initiatives in place. This is reflected in teacher response to a site-initiated survey in 2015 involving 94 staff. Survey findings suggest that they feel clear about their roles and feel that their role closely matches their skills and abilities. Staff also expressed positive feelings about working at the site and working in teams as well as feeling supported in those teams. In relation to a question about co-worker interactions, 85% of staff strongly agreed that they had opportunities for teamwork and could rely on colleagues for support (2015 School Annual Report)

**Aboriginal planning perspectives**

Aboriginal planning perspectives in a well-being context potentially provide alternative perspectives when used in curriculum planning. Interdisciplinary design is a *'highly contested process and demands constant wrestling with how to produce meaning in different and shifting contexts'* (Andreotti, 2011, p.5). Planning with a well-being priority provides thinking spaces where '*how'* and *'why',* to teach something becomes more important than 'what' to teach. Re-imagining and rearranging knowledge is an intense problem-solving process that resembles Aboriginal knowledge creation perspectives. For example, knowledge creation *'as a changing force that flows and is constantly evolving'* (Yunkaporta, 2007) aligns closely with the profusion of new knowledge in the 21st Century. Aboriginal understandings like this could provide ways to work with the abundance of knowledge in interdisciplinary design contexts and these sorts of descriptions also help to free up pedagogical thinking. Teachers could be well served by embracing Aboriginal knowledge standpoints in this site in particular, because of the attention paid by the leadership team to key values and knowledge creation understandings and practices that respect teacher tacit knowledge and what teachers have to say in regular staffroom discourses about their everyday observations.

**Integrated Programs created in a well-being context**

The Integrated Program guidelines provide the necessary scope for teachers to respond to 'student well-being' school priorities. However, the work and time involved in repackaging student evidence and re-aligning evidence with the various assessment scope and sequences and standards of each of the subjects integrated remains a barrier, of learning, as is the case across all schools delivering Integrated Programs. At this site however, it has become part of an agreed routine process and an opportunity too for the identification and development of collaborative structures and processes. Integration for teachers at this site is understood in terms of staying the course, being aware that there are structures and processes in place and if support is needed, you can ask and

> *If you're going to go down this path, just be prepared to problem solve it around, without thinking about all the structures that you've got in place that are going to stop it happening* (P, T894)



> *teachers and schooling are not the enemy, we are here to work together and whatever happened in your last school, this is not your last school* (P, T615).

A Teacher Leader was resolute in explaining the complexity and depth of knowledge required to integrate subject content. The process was described as something *'much deeper and more complex than collaboration'* (P, T633) and if it does not work in the first instance, teachers have learnt from their experience and are better informed to get it right next time. *'There's no punitive measure attached and that's part of our restorative practitioner approach to things at this site'* (P, T417).

Integration at this site begins with student well-being issues and there is an understanding that what teachers are involved in creating is *'neither subject matter nor a body of content but a process for achieving an integrative synthesis; a process that usually begins with a problem, question, topic, or issue'* (Klein, 1990, p.188). Integrated Programming, motivated by a collective purpose, supports teachers to feel valued and accountable to their peers which in turn results in more flexible working arrangements. For example, the Principal talks about teachers sharing the load and covering for each other if required and *'If someone's away the others all know what's happening, so the students don't ever feel that there's disruption to their program'* (P, T328).

**SACE Completion Package**

The first integrated package in 2002 at this school was a 'SACE Completion Package'. Destination data identified that students whose families were recent arrivals or from countries not regularly represented in service provision contexts were not entering into study or employment options linked specifically to community services. The school identified this as an opportunity to educate students about community services, so the aim was to embed SACE subjects in the Community Services Certificate 2 and

> *make the workload reasonable for students so they achieved the SACE and a Certificate II in Community Services, which strongly positions students for TAFE entry and makes them more competitive* (in accessing employment) (P, T74-78).

The focus was is valuing both the SACE certificate and the Community Services certificate through a process that identified SACE subject content that could be integrated and complements a vocational certificate. This package includes the integration of four subjects, English Pathways, Workplace Documents and Workplace Practices, each contributing 20 credits at Stage 2 level, as well as the compulsory Research Project, based on an area of personal interest. Assessment is both school and externally assessed and there are no exams.

**'SACE for University' package**

The inspiration for the 'SACE for University package' known also as the 'ATAR package' (Australian Tertiary Admissions Results, ATAR package) came about because staff identified concerns for the well-being of students in relation to the powerlessness of students to make pathway and subject decisions at the end of year eleven. Choices about what they really wanted to do the following year.

Because the 'Completion Package' had provided strong, student well-being outcomes and a relationships-based approach to learning, the decision was to replicate these features as part of a 'SACE for University package' for students who specifically wanted to do tertiary study. The design of the package was linked to skills students needed to both access and develop the capabilities to manage tertiary study, once they got to the university sector.

> A collaborative study by all three South Australian public universities found that 51 per cent of year 12 students find it difficult to decide what to study at university (Parks, 2017).

The ATAR package recognises the importance of not only prioritising *'successful learners, confident and creative individuals'* but also *'active and informed citizens',* capable of making decisions about pathway options as outlined in the 2008 Melbourne Declaration on educational goals for young Australians (pp. 6-7).

The 'SACE for University Package' integrates English Communications, Society and Culture, Information Processing and Publishing, Health and the Research Project so that the learning and assessment in each subject supports the other subjects in the package. Assessment is both school and externally assessed and there are no



exams. Successful completion provides a university entrance score (ATAR) that leads to most university under-graduate degrees (adapted from Site Report 2015).

**Other Stage 1 packages**

Other learning packages have been created at Stage 1 over a decade or more to address well-being issues observed. For example, it was observed the school was enrolling young men, some in their twenties, into years 10 and 11. Many had been identified with communication concerns, including parental concerns about the time their sons spent at home playing games and online. Consequently, an early career teacher decided that this was an opportunity to re-engage young men in education by making gaming an education option by creating an integrated 'Gaming package' that aligns with SACE requirements for Media Studies, Numeracy, Literacy and Gender Studies. This teacher collaborated with others to identify subjects that provided broad perspectives about 'gaming' including how gaming was used in media studies and gaming links to the subject 'Literacy' through the development and implementation of gaming narratives. Gaming statistics too provided the basis for accreditation for the subject 'Numeracy' and 'Gender Studies' provided opportunities to explore gender issues in gaming.

> *the kids re-engage; they develop friendships; they stay on to do year twelve. Some of them are now in Information Technology Certificate programs and some of them are at TAFE doing higher-level courses or have gone to university* (P, T160 - 174).

The program has offered an engaging alternative for a group of students who may otherwise be at home engaging in little else than Internet gaming. It appears that an unhealthy cycle can be broken through a focus on interrupting unhealthy behaviours because a teacher with similar interests saw an opportunity to broaden the scope of interests and skills of students include knowledge and skills that directly link to personal aspirations, futures thinking, and work opportunities related to gaming.

> *What we found with this group of students ….. is that they actually became quite energised about coming to school because it was all about them. It was about their interest, it was about their future, and it was about getting them from this point to that point. The participation and retention rate in that class is outstanding which is not always the case for young people who aren't all that academic, so for those young people their destination outcomes have been great* (P, T97).

The Construction Sandwich Package targets young people who have aspirations to work in building and construction but have not been able to achieve the literacy or numeracy SACE standards to access a building and construction pathway. Teachers have designed an Integrated Program that provides 'a second chance' literacy and numeracy learning experience explicitly linked to the building industry. The package includes 'Literacy' and 'Numeracy' as well as a vocational certificate in 'Building' that requires students to engage in the workplace for two days a week.

> *The perhaps not so fun stuff (literacy and numeracy) is sandwiched by the fun (Building) stuff and all of the Literacy and Numeracy is integrated with the Building program completely. So, there's nothing in their Literacy course or in their Numeracy course that isn't directly related to the work of building. So the Literacy and the Numeracy teacher works closely with the Building teacher to develop that program* (P, T443).

The creation of this package (and others) has engaged teachers in integration experiences that are proving to be self-sustaining through deep discourses that not only support teachers to value and respect the skills and knowledge of colleagues but that in turn motivates others to be advocates for imagining the possibilities of subject integration to support the well-being of students. Designing these packages has developed its own momentum and more recently teachers have been working on a Health Services package as an outcome of identifying student interest in 'Community Services' and interest in working as nurses, police officers, social workers and youth workers. Many of these students, however, with an interest in nursing, don't have enough science background or numeracy accreditation at Stage 1 SACE to achieve access to university nursing courses. To address education gaps teachers identified programming partnership opportunities with other health care organisations. With 'Centre Care' through a supported accommodation program and 'SA Health' through their Second Story education program for 75 young mums off site and with their young Aboriginal women's program.

Integrated SACE Packages designed with partnership organisations are meeting the gaps identified.

The integrated packages are carefully crafted learning objects. They have helped provide safe learning spaces for students where there have not been spaces previously and greater access to accredited pathways. The collective capacity of staff across generations at the school continues to be nurtured and the links between



integrative experiences, teacher satisfaction, and the retention of staff at the school means that Integrated Programs have become a key curriculum reform initiative. For some teachers it has engaged them for periods of up to two years or more to design packages of learning while for others, professional relationships to design learning together have been sustained for fifteen years or more.

**ANALYSIS OVERVIEW: KEY CASE STUDY 4**

The identification of 'contradictions' that impact on the design and implementation of 'Integrated Programs was not obvious in the data at this site. This is perhaps, not least, because Integrated Programming has been a key curriculum renewal strategy for over fifteen years and the school has addressed many of the ambiguities and contradictions impacting on teacher capacity to collaborate to design learning.

The contradictions identified in this site include the broader issues challenging all case study sites on a daily basis and include teachers working with policy that is focused predominantly on individualised teacher work rather than collaborative practice resolutions, as well as the invisibility of the 'Integrated Program' that relates to the unavailability of data through formal data collection processes.

**Teacher claims about professionalism in a well-being context**

Table 6.1 and 6.2 below identifies teacher claims that align with Bourke et al's definitions about teacher professionalism', Assertive Resistance' and Aspirational Resistance claims about teacher competence as a reflective practitioner and teacher claims that relate to 'leadership' aspirations rather than performativity.
The *'assertive resistance'* and *'aspirational resistance'* statements below, in respect to meeting the demands of curriculum in a 'well-being' culture, help to describe the possibilities for integrative synthesis and teachers working together to create curriculum resolutions because '*if we want to do something we can' (*FGD, ECT1, T717).

Given the opportunity, teachers recognise the benefit of being part of planning teaching of packages and the benefits of working together.

*Quite apart from the education, it's the structural, the systemic things that become easier. For example, students have two lessons in a morning, and if a teacher has got something on for a reason, teachers swap lessons* (P, T319).

*It becomes easier from a leadership perspective as well because teachers have built ongoing relationships of trust and are more likely to sort things out through ongoing discourses with design team colleagues.*

**TABLE 6.1: Assertive Resistance claims.** Teacher statements about professionalism that reflect 'confidence and competence as reflective practitioner (ie openness to new interpretations'.

- *One thing that is pretty awesome about this place is if we want to do something we can, and it doesn't matter if we want to create a new program or test out a subject or figure out different ways of doing things.* (FGD, T717).
- *All students need to be on board about the fact that they're not buckets that we're going to fill, they're going to be active participants in the learning.* (P, T655)
- *I was asked by the Principal to organise an integrated learning for Stage 2 as part of the Community Services and that's how it all started to support the Community Services students get their SACE and also get Certificate II in Community Services. The SACE Completion Package came along and I already had my integrated learning course that was the basis of the SACE Completion Package* (FGD, T725)
- *At one point I was teaching all four year 12 classes. Community Services, in the Community Services Certificate, the SACE Completion Package, and the ATAR Package, and then I had another year 12 class, Business and Enterprise, which is just a standalone subject, yeah. but I prefer working in the teams* (FGD, ET1, T742).
- *We have learnt to work together but I think the students need to learn that too, so I think that's why the packages are important because they give them the opportunity to do that. Whereas, choosing subjects you're going to do at university, you don't necessarily build those relationships, which in the senior years is the most important time to do that. In mainstream schools, we seem to stop building relationships in year 10 and year 9* (FGD, ET2, T608).



**TABLE 6.2:** Teacher claims about Teacher Professionalism: **'Aspirational Resistance':** Promoting leadership rather than performativity.

- *Interdisciplinarity here goes completely against what the SACE Board has decided to do when teachers design Learning and Assessment Plans. Here It's about the teacher having that high-level involvement in designing learning based on student interests and needs (GD, ET2, T649).*
- *The focus of the package isn't really about 'gaming' it's about how they learn, and that's not what these students (this particular group of students who have come specifically to 'do gaming', are really good at). The issue is that they are good at 'Gaming' and they have the potential to create highly sophisticated resources. Teachers' role is to support students to get the SACE so 'Gaming' is put to one side. The fear is that these students will not progress in year 12 or into tertiary studies because they see little relevance in learning other than in 'gaming. (GD, ECT, 450)*

Because this school offers a significant range of alternative curriculum options the consequence is that leadership teams and teachers in this school are required to manage two dominant and contrasting discourses about teacher professionalism, namely 'Managerial' and 'Democratic' professionalism models (Sachs, 2001, p.152). This ensures teachers, firstly, are able to explore the potential of Integrated Programming to sustain and develop a well-being culture and, secondly, the leadership team must be able to guarantee that teachers are not disadvantaged in regard to any future positions of employment as a result of their extensive involvement in designing Integrated Program options. A 'Democratic Professionalism' model, (Brennan 1996, in Sachs, 2001, p.153), includes at this site, a focus on 'cross-generation', 'coaching arrangements' and 'capacity building through integrated synthesis' processes.

So, for site leaders, administering both managerial requirements and support for more democratic philosophies to encourage teacher professionalism, means having to meet accountability expectations of a managerial system and encouraging democratic ideals and collective autonomy opportunities to create 'Integrated Programs' at the local level. Teachers too are required to adhere to systemic requirements (teacher standards) as well as contribute to the work of design teams responsible for managing curriculum reform locally for 'systemic emergence' (Gonzalez, 2014). The following teacher statement represents the tensions that exist

for leaders and teachers as a result of managing different models of teacher professionalism.

> *Interdisciplinarity goes completely against what the Assessment Authorities has decided to do when teachers design Learning and Assessment Plans. It's about the teacher having that high-level involvement in designing learning based on student needs, based on what's happening in the world, whichever subject it is, and having that sense of ownership and tailoring that learning, you're not teaching from a book, you're not teaching a prescribed program, you're teaching something that you and the class, and your team, are actually interested in* (FGD, ET1, T649).

Because of the school's *'bias to say yes'* approach to student well-being-inspired resolutions, design teams are required to make significant curriculum and pedagogical decisions autonomously. 'Democratic professionalism' encourages teachers to accept a 'wider responsibilities that include contributing to the school, the system, other students, the wider community, and collective responsibilities of teachers themselves as a group and the broader profession' (Brennan 1996, in Sachs, 2001, p.153). Teacher acceptance of these sorts of responsibilities is evident at this school.

Achieving an effective level of teacher autonomy and collaboration at a site level does not happen without significant and deliberate reform efforts and structural change. Integrated Programming draws attention to this paradox because achieving a level of 'autonomy' collectively is also intrinsically linked to designing 'Integrated Programs'. As a consequence, designing learning collaboratively highlights the need to revise teacher work and conditions. Systemic re-visioning of teacher occupational identity, although easily ignored, is a critical consideration for any future policy position about sustaining collaborative practice.

Site Leaders asserted that teachers involved in the design and teaching of the packages 'are not going anywhere' (P, T302) and for the past fifteen years or more, teacher immersion in interdisciplinary thinking and the design of learning has contributed to the retention and confidence of teachers at this site to lead reform efforts. As with the previous case study site, this school illustrates Andreotti's argument that immersion in knowledges helps 'shift educators' epistemological understandings about knowledge, curriculum, teaching and learning' (2012, p.2).



When integration to design learning is a priority; when teachers get to hear and experience other ideas as well as contribute their own thinking and expertise, they experience the vulnerability of not knowing and are challenged to address personal and professional gaps in conceptual understandings, skills and knowledge. When they are placed in situations as learners where they need to engage in collective reflexivity, risk taking and coping with ambiguity (as suggested by Davis, 2013), these situations expand participants' understandings of teacher work and teacher professionalism. As an outcome, teachers are perhaps more likely to continue to engage in integrated, collaborative design approaches.

Teacher claims about their engagement in design discourses suggest their understandings about designing learning had shifted to more collective autonomy understandings and the more teachers engaged in these processes the more likely they were to continue to do so – especially if the structures are in place to support the process. Claims include statements like '*It's about the teacher having that high-level involvement in designing learning', 'having that sense of ownership and tailoring that learning that makes education easy', 'if you're teaching the same thing we're open to each other's ideas too and we're all bouncing ideas off each other'* and *'re-prioritising and teaching and working* together'.

A senior Leader stated that from their perspective, when designing learning, teacher focus was transformed *'from a focus on specific subject content to a focus on students learning'* (P, T2). In situations where teachers can work with autonomy, collectively, the content referred to here has a lesser role, as teachers seek common ground on which to base ongoing discourses for deeper meaning.

Andreotti talks about the 'necessity of valuing and growing the importance of intellectual independence and professional autonomy of teachers as curriculum decision makers, as well as critics and being a conscience of society' (2012, p.7). Designing 'Integrated Programs' demands that teachers embrace their intellectual independence and professional collective autonomy as decision makers. Analysis of the data shows that the school has responded to these demands by articulating *'respect for teacher knowledge about what may work';* a *'bias to say yes to teacher ideas for what may work'* and *'teacher time to understand curriculum'.*

Andreotti provides recommendations about shifting teacher conceptualisations of knowledge and learning. For example, team leaders in integrated planning contexts requires 'curriculum to be contested' and understood as a 'negotiated social practice, rather than as prescriptions and requirements for development and implementation' (2012, p.8). Her recommendations are lived out at this site.

**Dimensions of Professional Autonomy**

Analysis of teacher claims about their experiences of working autonomously, as members of learning design teams, is presented in relation to Mausethagen et al's (2015) two dimensions of professional autonomy that includes the *'will and capacity to justify and develop core practices'* and *'the will and capacity for self-governance'*.

**TABLE 6.3: Teacher claims about Professional Autonomy**: 'the will and capacity for self- governance'

- *I think collective ownership of Integrated Programs is incredibly important and I still sometimes will encounter a teacher with a slightly lightened position on that and it's really, really quite strange to me, because we have designed this work together it's like this fiefdom, We have built this fiefdom (this way of working together) and they (other teachers) don't get that., They exist in a world where 'you can't have it, don't touch it, it's mine' exists.* (FGD, ET1,T 823)
- *We probably work together pretty well, and we've got the same sort of caring sort of nature. Leadership thought we would slot in well with the group …. we like doing new things…..We're not scared of a challenge….. and It can be fun* (FGD, ET1, T185
- *We work as a team rather than as an individual* (FGD, 203) *and I like working with a team of teachers and being really close. We also have meetings often, or we communicate by email. When we're sending emails about something we email the whole team, so we're all aware of what's going on, especially if there's something wrong……* (FGD, 195)

Teacher statements reflect the will and capacity for self-governance at this site. and teacher 'will and capacity to justify and develop core practices' when designing and implementing Integrated Programs. Teachers make reference to their own learning across the range of subjects and discuss their learning as a result of strong design relationships achieved.



This school has embraced strategies to develop teacher capacity to collaborate and achieve a significant level of design autonomy. Strategies in place include '*decision making within a well-being paradigm, 'a bias to say yes'* to teacher ideas; 'a *respect for teacher knowledge and teachers' gut feelings for what may work* and respect for the capacity of teachers to lead curriculum reform at the local level. A Senior Leader made reference to the need for protocols for design teams of teachers to design learning collaboratively including

> *teacher time to fully understand the curriculum that they're working with; time to imagine the opportunities within it; and time to be creative in how that's going to be planned and implemented* (SL2).

An early career teacher shared her story in the following statement.

> *Because Leadership at the school are really supportive and really believe in this, (collaborative design) we believe in it too because we've seen it work, but without leadership it would be difficult* (FGD, ECT, 711).

Acknowledgement of *leadership* that enables teachers to believe in the merits of a key practice is an indicator of teachers accepting responsibility for practice individually and collectively.

Metaphors teachers use to describe collaborative design in a well-being context

As part of a Focus Group Discussion to describe collaborative design experiences teachers came up with metaphors that best describe their collective experience. A detailed discussion of metaphors imagined across the key case study sites is also discussed in Chapter 8. See metaphors teachers use to describe the collaborative design experience Table 6.4, below.

**Table 6.4: Metaphors teachers use to describe 'collaborative design'** in a well-being context

| **Metaphors teachers use to describe their collaborative programming experiences** |
|---|
| - *I think of a beehive.... the bees are crawling all the way around and they all get all sort of mixed up. Even though they've got their own little hole, they're allowed to go and visit everybody else'.*<br>- *It's like a bucket of swirling water…you pour in all the subjects (represented by different colours). Integrated Programs are represented by the colour red and it doesn't turn brown like all the others. It stays red.*<br>- *You're kicking with a team …… you've got a team playing the same game and everybody's got a particular skill set that helps the team win…..* |

The swirling bucket of subjects, metaphor represents the sustainability of the integrated design approach. The Integrated Program remains red, despite the swirling, while the other subjects merge into something less identifiable.

The imagery of confident bees visiting all parts of the hive to build relationships and learn about what everyone else is doing, invokes happy, collaborative, liberating working arrangements. This imagery reflects the school's well-being paradigm and a focus on 'strong relationship-based approach to learning' (P, T118). The Principal suggested that because teachers are focused on strong relationship outcomes professionally, students also need to reciprocate, and stated

> *Teachers at the site have learnt to work together but I think the students really need to learn that as well, so I think that's why the packages are important because they actually give students the opportunity to do that, to build relationships, which to me, seems like the most important time that students should be doing this, whereas the system seems to stop it in year 10 and year 9* (ECT, T600-609).

This statement raises some very fundamental issues about the role of integrated learning as a way to encourage student relationships in the senior years that link to student well-being outcomes. A singular focus on SACE completion can marginalise learning linked to 'relationship building', 'collaboration' and 'interdisciplinarity' thinking and learning in senior secondary contexts because these concepts 'are neither subject matter nor a body of content but are 'processes' for achieving an integrative synthesis' (Klein, 1990, p.188).



A 'well-being focus' and 'collaborative design' practices demand *'relationships for learning',* consequently, opportunities for students to build *'relationships for learning'* are more easily prioritised in collaborative planning and learning contexts where students remain with the same group whilst participating in shared learning experiences.

When planning learning, teachers in this site are encouraged to include a focus on one or more of the 'Capabilities', key elements of the Australian Curriculum. As noted in Chapter 3, Implementation Officers (2012-2016) suggest the general capabilities offer significant opportunities to develop collaborative school cultures and practices. Capabilities that contribute to 'collaboration' and 'relationship' concepts include the *'personal and social capability' 'social awareness'* and *'social management'*, '*appreciation of diverse perspectives'* and '*ways for students to contribute to civil society and understand relationships'.* The Capabilities are aspirational concepts and are strongly supported at this school through integrated programming and teachers 'abandoning individual agendas in favour of collective approaches to improve student achievement' (Kania and Kramer, 2011, p.1).

Collaboration at this school is well on its way '*to be the new normal'.* The strategies, or 'collective impact initiatives' (Kania et al, 2011, p.25) this school has actioned such as *'decision making within a well-being paradigm'; 'a bias to say yes' to teacher ideas', 'respect for teacher knowledge'* and *'paying attention to the details'* of reform efforts reflect key elements of a 'collective impact initiative'. Other resources developed include *'teacher capacity to collaborate', 'relationship-based approaches to teaching and learning'* and *'integrated programming inspired by student well-being outcomes'.* These resources are both acknowledged and articulated with pride.

The fact that teachers are collaborating to design learning has 'accelerated change in this site, without requiring breakthrough innovations or vastly increased funding'. These kind of changes reflect 'a series of previously unnoticed solutions and resources that have been identified and adopted', by school leadership prepared to problem solve the details of teacher practice (Kania and Kramer (2013, p.9).

**SUMMARY**

When 'the well-being of students' is a driving influence for on-going reform and 'teacher identified ideas to address curriculum needs' are actioned, the outcomes found at this school are potentially profound for staff and students. The Principal reflected on aspects of what could be considered, a 'collective impact reform model' in the following statement.

> *The well-being was supported really, really well here. It was that really strong relationships-based approach to learning, which I think is one of the real defining moments, that for us underpins our cross-disciplinary approach in the way that we've packaged the learning* (P, T119).

The site leader was referring to the relationship approach applied that is about 'leadership responsiveness' and strategies that 'position teachers to 'influence' (Donohoo, 2016). This complements efforts to progress the professionalism of teachers; 'teacher knowledge, autonomy and the capacity to collaborate (OECD Professional Teacher Index, 2016).

Kania and Kramer describe leaders of successful collective impact initiatives as those that 'embrace' a new way of seeing, learning, and doing that marries emergent solutions with intentional outcomes' (2013, p.10). Site Leaders have achieved emergent solutions; and the term *'real moments'* referred to by the Principal describes a certain synergy when 'well-being' became a solution – not just an aspiration but a means of balancing the demands of curriculum with how to design and teach. It describes a synergy of knowing and understanding.

In Aboriginal knowledge creation contexts this could be referred to as synergistic knowledge creation. A balance achieved between opposing worldviews. On the one hand the proponents who insist that students are vessels to be filled and on the other, because of "*well-being' and 'strong relationship' norms, 'all students are active participants in the learning'* (SL1, T651-58). So, when teachers design learning with a focus on SACE completion and SACE content only (the tension), well being and relationship priorities are marginalised. By making 'well-being' (the balance) or the solution for the design of learning, a space has been created for *'new creation rather than conflict and destruction'* (Yunkaporta, 2007). This perhaps offers a way forward for curriculum reimagining in the senior years in this site.



# CHAPTER 7

## CASE STUDY 5: TEACHERS DESIGNING INTEGRATED STEM PROGRAMS

### INTRODUCTION TO 'STEM PLANNING' AND LINKS TO TEACHER COLLABORATION

This is a case study about teachers from two metropolitan high schools and their experiences of STEM professional learning and implementation of STEM programs created as an outcome of their involvement in the South Australian STEM Strategy (2010-2015 and 2016-2020).

Teacher experiences of Integrated 'STEM' programming are important inclusions in broader research about teachers designing learning together, particularly in the current education policy context which gives priority to STEM professional learning for the development of STEM teaching and learning in South Australian schools (DECD STEM Strategy 2016 and 2017-2020 p.8).

STEM professional learning Providers however continue to experience a level of resistance from school leaders to support and develop the structural changes and teacher capacity required so teachers can collaborate in the development of STEM programs.

**Context for Case study 5:**

A key driver of STEM nationally and globally is the United Nations' 2030 agenda for Sustainable Development, entitled 'Transforming our World' which established 17 Sustainable Development Goals to tackle global issues such as poverty, climate change, food shortage, the protection of the planet; and to ensure that all individuals enjoy peace, prosperity and a quality of life for all. Education and particularly Science, Technology, Engineering and Mathematics;(STEM) Education, was

identified to play a crucial role in achieving the 5 sustainable development goals listed above and

> STEM education was identified as a way 'to develop and provide innovative solutions to global issues, in particular those directly related to the 2030 Sustainable Development Goals., (Soo Boon Ng, UNESCO, 2019, (Abstract) .

Soo includes two very important considerations that are included in earlier discussions. Firstly Soo identifies school timetabling and collaborative planning opportunities that need to be provided for teachers of contributory disciplines to work together (2019, p. 41). Secondly, Soo suggests there is some urgency required for examination and accountability systems to embrace and assess STEM (and STEAM) in ways that promote STEM competence. If this is not achieved Soo suggests, 'integrated multi-disciplinary and trans disciplinary approaches will remain aspirational and elusive'.

These issues are referred to in Chapter 1 also as part of key issue discussions, particularly Key issue 4 that talks about the invisibility of interdisciplinary planning options. Key Issue 5 builds upon some of the barriers to interdisciplinary thinking and planning and teaching in a discussion about limited availability of data about Integrated Programs to inform future generations of teachers. Key Issue 7 as well, discusses the importance of acknowledging interdisciplinary design expertise that often lies latent in schools.

> The DECD STEM strategy (2016 and 2017-2020) includes STEM education is an identified priority in many schools across the state with '139 schools receiving STEM Works infrastructure upgrades and access to tailored support to develop a STEM learning strategy' DECD, STEM Strategy (2010-2015)

The STEM Strategy is aligned to the South Australia's Strategic Plan (Target 88) and is a priority for the Department of Education and Child Development (DECD) in this State. One of the key targets is to increase by 15%, the number of students receiving an Australian Tertiary Admissions Rank to university courses or equivalent in advanced mathematics, physics or chemistry by 2020.

The Case Study that follows includes interviews with key STEM stakeholders responsible for the management, facilitation, and implementation of STEM State Government initiatives. Interviews were conducted with three facilitators of STEM;



one from a school, whose focus was STEM professional learning; one from the corporate sector with a brief to encourage STEM governance structures and another from the university sector engaged in STEM research in schools. Teachers interviewed from the two schools have all been part of a four year STEM professional learning strategy (2010-2015). Five teachers, two experienced and two early career teachers from one school and a STEM Coordinator from the other were interviewed.

The strategy identifies a focus on 'interdisciplinary thinking' and by association therefore integrated 'planning and teaching expertise. The real challenges, however, are changes to traditional schooling structures to accommodate interdisciplinary thinking and collaborative planning and the prioritising of teacher professionalism.

This case study largely contrasts with the previous three key case studies where the focus has been about whole school adoption and adaptation and dissemination of integrative synthesis and interdisciplinary thinking and collaborative design practices, based on three clearly defined and distinct school priorities. These site specific priorities were arrived at independently as part of whole school decision making processes, and include 'interdisciplinary thinking' as part of a STEM focus school (Case Study 2), 'student engagement' (Case Study 3) and 'student well-being' (Case Study 4).

This STEM case study, in contrast to the three Key case studies, includes the insights of those responsible for the facilitation of professional learning of STEM in schools state-wide and teachers from two the STEM sites who have been engaged in four years of STEM professional learning. The analysis of teacher responses about their engagement in the STEM Strategy professional learning initiative (2010-2015 and 2016-2020) includes the same research interests as the three key case studies built around teacher claims about teacher professionalism and engagement in collaborative design practices, the transformation of teacher practice as a result of planning STEM learning together, teacher claims about teacher autonomy linked to the design of STEM programs and an analysis of metaphors teachers use to describe the experience of planning STEM learning, are included.

Because of the contrasting motivations for the introduction and implementation of integrated programming in STEM sites, compared to more autonomous decision

making driving the implementation of integrated programming practices in the previous three case studies, this case study includes references to and comparisons with, the other case studies.

**RENAISSSANCE OF STEM LEARNING**

Integrated 'interdisciplinary inspired renaissance of STEM curriculum' is a global education priority driven by a belief that integration of subjects into a cohesive learning paradigm linked to real world applications is the best way to achieve technology inspired contents that show students how STEM can be applied to everyday life.

To support integrative synthesis practices, teachers need confidence in their ability to engage in integrative synthesis and a sense of 'collective efficacy' (Bandura, 1997, Eells (2011) and identity. Leavy identifies the need to 'stimulate and propel the innovation that remains latent in many schools' (2012, p.25) that includes strategic leadership to enable collaborative design cultures to evolve so teachers have the space and time to engage in interdisciplinary thinking to help shift teacher thinking and practice to grow the 'intellectual independence and professional autonomy of teachers as curriculum decision makers' (Andreotti and Pashby, 2013, p.8). Teachers also need to be able to reach consensus about fields of knowledge around inquiry based topics, as well as engage critically and collectively in synthesis of knowledge and advocate strategically for particular inclusion of key concepts and understandings in an integrated programming context.

One of the STEM facilitators responsible for the state-wide professional learning of STEM across schools strongly articulated the importance of "*truly valuing the decisions teachers make about their teaching and learning"* (L1, CS 2, T579).

Andreotti and Pashby (2013) talk about

> respecting the timing of individual learners in processing and taking ownership of their learning that acknowledges the role and importance of tensions, dissonances and crises when learners (teachers in this instance), engage with deep shifts that involve the re-arrangement of internal concepts.

Andreotti and Pashby recommend attention to the fact that teacher identities are constantly being renegotiated, and particularly so perhaps in interdisciplinary thinking



contexts, where shifting understandings, about knowledge and learning 'are life-long processes, that are intertwined with identities, roles and relationships within and beyond professional spaces' (2013, p.8). This study includes data about the shifts in teacher knowledge specifically as a result of their work as interdisciplinary designers. For example, an early career teacher talked about the collaborative design experience

> *as transformative because if for no other reason than just being exposed to so many different ideas'* (STEM Site1, T676).

Getting teachers to this stage, however, is not just about working together after school or for a day or two once or twice a term; it is about on-going teacher collaboration, deep immersion and sharing of conceptualisations of knowledge and understandings supported by structural change and a focus on the domains of teacher professionalism; teacher knowledge, including STEM literacies, teacher autonomy and teacher capacity to collaborate. It also includes what is defined as *'scientific habits of mind;* values, attitudes, and skills in the context of science education, that relate directly to a teacher's outlook on knowledge and learning and ways of thinking and acting (Science online, May 2019).

The 2010-2015 and now the 2017-2020 STEM strategy in this State are part of a continuing national and international STEM reform effort over the last two decades. Schools and leadership teams driving this change in South Australia to facilitate 'STEM integration and structural reform' so schools can interrogate opportunities for changes to teacher practice and schooling structures that enable 'curriculum integration and strategic planning' opportunities.

Despite the efforts of facilitators of STEM professional learning and their belief that schools, and teachers can participate successfully in an 'interdisciplinarity inspired renaissance of STEM education' (Bissaker, 2014, p. 56), facilitators continue to express concern that too often the response from key site leaders in participating schools is: *it is 'too difficult'.* Despite resistance, STEM Facilitators (SF) trust in their course of action that '*if there was a commitment to the structures that support teachers and truly value the decisions that teachers make about their teaching and learning by giving teachers the power to make those decisions'* (SF1, T579), then greater STEM progress could be made.

STEM education, and its links to the professionalism of teachers that include a focus on teacher knowledge, autonomy and the capacity of teachers to collaborate, offers significant opportunities for reforms to teacher practice more widely not just in STEM contexts. Constraints and contradictions exist, however, as explored in the three key case study sites and it is important to highlight them in a STEM professional learning context so education stakeholders take responsibility for addressing their impacts.

The focus on teacher practice actioned through '*curriculum integration and strategic planning'* strategies in the key case study schools provides opportunities for teachers to develop professional knowledge and autonomy as well as the capacity to collaborate. This approach is applicable in any curriculum context and is more likely to be sustained if teachers from all disciplines, not just STEM focus subjects, are involved in '*curriculum integration and strategic planning'.* Interdisciplinary approaches for planning, teaching and learning appear to be closely associated with teacher professionalism outcomes and this is reason enough to embrace 'collaborative design' as a way of working with knowledge in any school contexts (see Key Case Studies: Chapters 4,5,6).

## LEARNING DESIGN COMPLEXITY IN STEM CONTEXTS

A STEM Manager (SM) from the Department of Education in this state raised 'teacher practice' issues associated with the complexity of planning learning from a STEM planning perspective. The statement mimics 'planning learning' issues, motivating this study.

> *Unless planning is actually arranged as part of a teacher's day, there isn't a lot of opportunity to sit down and actually jointly plan significant pieces of work such as STEM units. Teachers are busy, they need time to reflect, and they need time to develop those personal skills with each other and be able to give each other feedback and be able to trust each other, because I think we do that very poorly* (SM, T406).

> *Teachers love having time out to reflect and to actually plan, and to do all those sorts of things as you know sometimes you don't get time to do them at school. So that's what we struggle with; time for teachers to experience planning for STEM as part of a normal working day* (SM, T112).

This is recognised as a key barrier to reform, yet decision makers continue to do very little to address the structural changes required to progress interdisciplinary thinking and learning including in STEM contexts which is identified as a key determinant for



economic growth and prosperity nationally and internationally and discussed in the opening paragraphs of this study

### Leadership Support for STEM Planning

The manager of STEM initiatives in this State discussed the need for support for STEM reforms from senior leadership *'If the Principal is not really on board and directly involved, the program will be just a series of activities that happen in a few classrooms'* (SM, T97).

A Facilitator of the 'Advanced Technology Industry Program' a program prior to the STEM Strategy and aimed at STEM leadership reforms stated

> *I've worked with 19 schools for five years on Advanced Technology Industry Program, STEM. So right at the beginning, our professional learning responsibility was to work with teachers to help them come together. They did these bone diagrams around where I am now, where I want to be in terms of my integrated curriculum, what will be the enablers, what will be the barriers. And the biggest issue they were saying, over and over, even after four years they were still struggling to get the subjects scheduled at the same time so they could actually do some legitimate cross-subject work* (SF, T1317).

The STEM Manager (SM) stressed the importance of the early adaptor; the teacher who is passionate about what they do in STEM to contextualise learning. The Manager identified numerous timetable issues that needed to be addressed so that teachers can plan together (SM, T209) and lamented the frequency of schools returning to old ways. He suggested that schools needed to

> *toss things up in the air quite drastically if they are going to do STEM in the real traditional sense* as part of 'integrated interdisciplinary planning.

He described student access to Science, Maths and Technology resources in interdisciplinary contexts and variations on that theme where schools might plan a project and at various stages; do something in Science, something in Maths, something in Technology. He stressed *'it's not going to be the same for every school. What they do is going to be context specific'* and that is in terms of student engagement. He also noted that many STEM programs were achieving increasingly good outcomes (2010-2015) the longer schools are engaged on the STEM strategy.

**Planning: a key component of teacher work**

STEM planning and the design of STEM programs in this State is increasingly recognised as significant work and this acknowledgement about 'planning' is important in terms of ensuring the development of 'planning cultures' with their own language and discourses. As 'planning cultures' evolve, planning information is more likely to be disseminated and applied and consequently it is more likely that resourcing for planning may follow.

Planning learning is also increasingly significant as curriculum stakeholders respond to calls for a 'creative economy'. The South Australian Principals Association (SAPA), in 2015, declared *'there must be a deliberate shift away from the teacher delivering content to the more highly skilled requirements of the teacher orchestrating learning'.* This includes a greater a focus on the professionalism of teachers (knowledge, autonomy and capacity to collaborate) but the question is how? SAPA suggests

> DECD would need to harvest the innovation in our schools and undertake explicit task and assessment design practices that enable students to demonstrate growth and development in knowledge across all general capabilities, (ICT, critical and creative thinking, personal and social development, ethical understanding and cultural understanding) not just literacy and numeracy (SASPA, 2015).

This study suggests the 'how' to achieve these sorts of outcomes includes collaborative design' and a focus on the professionalism of teachers.

What is evident and significant from the SAPA statement is the increasing recognition and focus about design aspects of teacher work and it is no coincidence that 'design thinking has its essence in the notion of integrative thinking (Martin, 2010); and involves the capacity to exploit 'opposing ideas and opposing constraints' in the creation of new solutions; 'it is often about understanding the culture and context before knowing where to even begin having ideas' (Leavy, 2012, p.27).

This sort of advice and understanding teachers require because of the increasing design aspects of their work is important for school leadership teams to consider in their efforts to respond to STEM reforms. A starting point includes building teacher capacity to collaborate. The very essence of design is that it is a human-centred action and, in education contexts, design emphasises the key role of teacher as



observer in a particular context before generating ideas about what the learning could look like. The Principal (CS 4) for example stated,

> *it is teachers who know their students best and know what works best for students*.

Because of the very open respect shown for teacher knowledge, teachers at this site are encouraged to respond to what they observe individually and collectively in order to provide the best learning experiences for individual and specific student cohorts. Leadership teams are reciprocating by purposefully saying 'yes' to teacher curriculum ideas.

The South Australian Principals Association recognise teachers as social and collaborative learners and promotes the belief that teachers need to experience, understand and model how collaborative learning works if they are to successfully create integrated learning opportunities for students (SASPA, 2014)

Collaboration between teachers formally (and informally) is central to teacher work but is rarely provided for as part of daily routines to support teachers to undertake a myriad of actions, from focused reflections on current practice, to reduce differences between class performances, to moderation work and professional dialogue about how to improve student engagement and achievement, share best practices, and trial and appraisal of improved approaches to teaching and learning. The list of planning and evaluation work for teachers is lengthy, but yet to be fully resolved systemically in terms of allocations of teacher work and how time is utilised.

**STEM Planning and Teacher Value Systems**

Culturally, we are not at that point where as a school system we are able to embrace the increasing complexity of the design aspects of teacher work. Teachers, however, continue to persevere with the multiple layers of 'knowing' and the demands of curriculum conceptualisation at the local level because designing learning individually and collectively is a process that is both creative and affirming of teacher identity, an underestimated but key driver of innovation in schools.

The practice of subject integration is fundamentally about the inclusion of 'other' and it's also about achieving more equitable socially just outcomes for students. If collaborative design is added into the mix, teachers can share and reciprocate. This

provides a basis for the development of a 'community of equals' (Sennett, YouTube 2012) where teachers can be supported to develop a sense of shared responsibility about what happens in schools.

This is echoed in a comment from an early career teacher, who stated,

> *I think being more collective as a profession and having this collective idea that we are jointly responsible for improving the profession and improving what's happening in the schools, what's happening for the students. I think that is something that needs to be promoted more* (ECT3, T473).

This statement emphasises the necessary complexity of the collaborative design process. It not only talks to us about being collaborative in an interdisciplinary design context that promotes respect for others subject knowledge, but it also speaks of teacher professionalism, teacher values, reciprocal obligations, collective responsibility and a fairer, more equitable distribution of power in our schools. A statement like this, from a collaborative design place where teachers are feeling pretty good about themselves professionally, speaks loudly in favour of teachers designing learning together.

The STEM site 2 Coordinator described the actions of an early years STEM teacher in progressing the STEM program at their school. *'We were re-constructing knowledge; planning together; team teaching together …….. and if we were out shopping, 'Oh, Sam needs some of those bamboo things, take a picture.' – 'Sam, do you need some of these?' 'Yeah Tony, get me some, like that sort of thing'.* He described the scenario as:

> *almost celebrating a relationship, a teaching relationship, because we helped each other out so much". "We'd give each other presents all the time, …. What I mean by that is I could identify if she was struggling in say Electronics, and so if I saw something, 'Oh Sammy, I've got these little solar panels for you, they're really easy to work. See these little kits here, you can ….. 'Oh, thanks Tony', and that sort of thing'* STEM Site 2, T313).

The links between 'scientific' habits of mind, and teacher tacit knowledge and values such as respect, reciprocity and responsibility, is evident in this statement, but yet to be fully appreciated as a means of driving innovation and change in STEM contexts. This study suggests that attention to Indigenous values and understandings of respect, reciprocity and responsibility, in particular, may enable us to understand how practices are related to value systems and how they can be applied in schooling



contexts including in STEM planning contexts. Values are specified as part of a 'Collaborative Design Framework' for use in interdisciplinary design contexts (See Chapter 9).

**REFLECTIONS: DECD STEM Professional Learning Strategy (2010-2015)**

The DECD STEM strategy, implemented 2010-2015 and again in 2016, 2017-2020, is part of efforts to achieve a 'systemic emergence' of STEM teaching and learning in South Australia. Gonzalez describes 'systemic emergence' as a

> *systems level intervention; a scaling and diffusion program across schools designed to enable professional collaboration'* (2014, p.4).

Professional collaboration' is at the core of 'systemic emergence' interventions to engage teachers in a 'significant "re- imagining" of STEM education' (Bissaker, 2014, p.56). The DECD STEM strategy, is a reflection of a 'systemic emergence' intervention, (that includes) efforts to 'enable professional collaboration' but it requires significant cultural change and is a limiting factor in this State's efforts to re-imagine STEM education'. How it is addressed in the future requires a possible focus on more detailed attention to the enablers of collaboration. (See Appendix #5, Building Teacher Capacity)

The Department of Education's STEM professional development program in South Australia promoted integrative synthesis, structural change and the creation of governance structures, but this did not extend to a focus on influencing whole school priorities related to professional collaboration. In the first instance (2010-2015), STEM professional learning was to *'develop teachers' inquiry-based capacity to engage students in STEM'* and opportunities for STEM teachers to cooperate to design inquiry-based STEM programs with engaging pedagogical resolutions to enthuse the next generation of possible STEM graduates. The following STEM Strategy (2016 and 2017-2020) has an additional emphasis on interdisciplinary thinking with a focus on teachers and collaboration in reference to students.

These strategies are strongly supported at the local level. However, achieving sustainable changes to school cultures and teacher practices also requires locally conceived visions and practices, which are beyond the responsibility of the STEM

initiative. STEM professional learning requires structural change at the local level and a focus on 'professional collaboration'. For example, Case Study 2 has a strategic focus on 'time for interdisciplinary thinking', and Case Study 4 has a focus on 'student well-being' which are both locally conceived visions with a focus mainly on changing teacher practice and the capacity of teachers to collaborate to create Integrated Programs.

Much to the frustration of those responsible for STEM professional learning, the realisation by site leaders from schools taking part in the STEM strategy about changes needed at the site level to achieve significant STEM reform, has not been fully realised. Such work is challenging traditionally held values and beliefs about knowledge, teaching and learning as well as schooling structures that have purposefully privileged disciplinary knowledge approaches for planning, teaching and learning. Unfortunately, this has resulted in some school leaders retreating to familiar, less challenging positions. Interdisciplinary thinking and planning processes are perceived generally as 'a good idea' but they remain on the periphery of curriculum design options in a curriculum dominated by the disciplines. Doing something about schooling structures and teacher work so that teachers can collaborate is a road less travelled, one littered with scepticism, doubt and only a partial belief in teacher capacity to work with complexity. Leaders in some schools are yet to be convinced that 'interacting effectively is what teachers do best', described as the 'mutual core competence of a teacher' (Salonen et al, 2015) – a starting point worthy of systemic attention. A focus on teacher professionalism, including teachers sharing interdisciplinary knowledge to design learning, can 'transform teacher knowledge, curriculum, teaching and learning to provide innovative curriculum solutions' (Freeth and Andreotti, 2012, p.8). Principals and their leadership teams need to build trust, respect and provide teachers with the autonomy to make such decisions, collectively.

School Leadership in STEM focus schools could benefit from findings of the international CREANOVA project that suggest 'creativity and innovation benefit from collaborative, multi-professional and cross-cultural learning' (Davis et al., p.189). Davis suggests a collaborative design process,' is 'like the glue' (2013) that bonds creativity and innovation and leads to a desirable outcome. When teachers design learning together, they experience creativity as a collaborative process that lead to innovative curriculum resolutions. 'Creativity and innovation are enabled by



environments that engage with diversity, celebrate complexity, and value collaboration' (Davis et al., 2012, 194).

> The creativity of the CREANOVA project itself stemmed from collaboration across countries of a diverse group of researchers and it stands as an example of what can be achieved when people from different cultures collaborate, explore and joint problem solve in ways that don't assume there is one universal approach to learning or working (Davis et al., 2012, p.195).

Teachers are also not removed from the evolution of design concepts including for example, the evolution of 'backwards design' planning required in a standards-based curriculum such as the Australian Curriculum. Design has become

> far too important to be left in the hands of designers (Leavy, 2012, p.26) who know broadly, but not deeply, about the learning interests and learning needs of students in local contexts.

> 'Design thinking' in an interdisciplinary design context, starts with

> *teachers observing and identifying 'student well-being issues' and leadership actively preferencing, 'yes' responses to teachers' curriculum ideas. It culminates in the sharing of design principles and practices and leadership encouraging all staff, not just STEM staff, to engage in the design of Integrated Programs* (FGD, CS4).

Interdisciplinary design thinking is a shift from a passive relationship with curriculum and between teachers and students to more active, meaningful and productive engagement of stakeholders at the local level. Learning from this study suggests that teachers do not shy away from design challenges; rather, they embrace them knowingly. Knowing about collaborative design practice in STEM design contexts, therefore, is a step towards achieving innovative STEM curriculum developments.

**ANALYSIS OVERVIEW: CASE STUDY 5**

As with all the case studies analysis includes the identification of contradictions experienced, by teachers on a daily basis. Analysis too of teacher claims about their experiences of professionalism and teacher autonomy and teacher claims too about the transformation of practice from individual to more collaborative practices. Metaphors teachers use to describe the collaborative design experience are also analysed.

**Analysis of 'Contradictions' experienced in a STEM design context**

Analysis of 'contradictions' experienced in a STEM design context included teachers questioning the restrictions placed on *'interdisciplinary thinking and designing'* across all other subjects other than STEM subjects. Teachers at STEM site 1, questioned the exclusiveness of the STEM strategy and designed their STEM program with the inclusion of Art. *'We took STEM to be a STEAM (Science, Technology, Engineering, Arts, Mathematics) approach and we're going to run with that'* (STEM site 1, ET 399). Four teachers worked on a cross-curricular program with Technical Studies, Art, Mathematics and Science and the aim was to produce 'Kinetic Art' for display in the school. The topic was divided into subjects with each faculty responsible for the development of a unit plan that addressed the learning and assessment of each individual subject.

The process actioned by teachers in this STEM design scenario, describe a silo integrated approach where the disciplines are taught separately and knowledge relates to each discipline. A STEM 'silo approach' does not overly challenge teacher thinking nor work practices that support a more sustainable STEM approach, but it was considered an important transition to engaging teachers in integrated design approaches in the future. Teachers opt for this approach largely based on school organisational issues and the availability of time in schools.

In contrast, teachers in two of the key case study sites, adopted more of an *'integrated interdisciplinary approach'* to STEM education that removes the walls between each of the STEM content areas and teaches them together. Teachers in case study two and four talk about …*'designing learning collaboratively as rewarding",* 'a process that *'respects the status of education as something important'*. They described collaborative design work as *'something that is creative, an ongoing thing', and the learning created as something with 'the flexibility to be reshaped along the way rather than being restricted to a two-week workshop to design the year'* (ECT, T465).

A second contradiction identified was about *'pushing against the stereotype'* in STEM contexts. Interdisciplinary thinking and designing learning, collaboratively, assists in transferring the control of knowledge; the control of curriculum, to those participating in the synthesis of curriculum knowledge at the local level. Synthesising



knowledge collectively across STEM subjects changes the subject about what is being discussed and, according to Sennett this 'changes the control of knowledge' (YouTube, 2012) for those designing the learning, as well as for those who are leading STEM reform efforts, but may not be part of the design process. Synthesis of knowledge, for those reimagining content knowledge, therefore results in teachers taking greater control of curriculum at a site and systems level.

> *we are used to the hierarchical structures and if you have to cross the boundaries, that can be quite difficult and unless you have approval, it's difficult because some people are very comfortable working with change and some people really struggle with that. I struggle when trying to get somebody who's higher on the totem pole than me, to do something* (STEM site 1, ET, T350).

The contradiction is that those with 'power' locally and systemically, may not embrace a shift in control of the curriculum space to 'teacher designers'. An experienced teacher; in STEM Site one, identified two *'aspirational resistance'* perspectives that could be actioned as possible reform strategies. The first was *'to value the process'* and provide 'time'. The second was '*to push against the stereotype'* in relation to support for innovation, from leadership teams. The transference of the control of knowledge is an important consideration in the integration debate. Regardless of how much integration is achieved programs created collectively are more likely to be developed further if they are created and acknowledged collectively. The eight Integrated Programs (CS,2) that include nanotechnology, aquaculture, robotics and communication technologies, biotechnology, photonics, genomics, polymer science, and (CS4), Stage 2, 'SACE for Work' and 'SACE for University' integrated packages, have been sustained and promoted broadly through 'systemic emergence' processes. All have achieved a level of official recognition but there remain many Integrated Programs unidentified because of limited official data collection processes (see 'Issue 5,' Chapter 2).

**Teacher claims about professionalism in a STEM reform context**

The reform context refers to the DECD STEM Strategy (2010-2014). Analysis reflects upon teacher statements that align with Bourke et al's definitions of professionalism; 'Assertive Resistance; and 'Aspirational Resistance'.

**Table 7.1: Professionalism claims (Aspirational Resistance)** in two STEM site Statements reflect teacher leadership rather than teacher performance.

- *We took STEM to be STEAM and we're going to run with that* (Site1, ECT).
- *I constantly had this discussion with the previous Principal. If you want inquiry based, learning you need to put the structures in place, you need the right staff, you need lots of logistical things in place* (Site 2, ET).
- *Everything is really, really important, everything is vitally important until it comes to the timetable monster, and then the timetable monster dominates* (Site2, ET, 56)
- *Keeping students in STEM options we use back-pocket STEM solutions: by using Community Studies B or Integrated Learning –What a teacher will do is recruit 12 for Physics, 12 is a critical number, three weeks into the course all of a sudden you've only got six kids, so that's what we try to avoid, (by having back-pocket solutions) to keep the kids in the class; You're doing the same stuff, you're just doing Community Studies or Integrated Learning.* (Site 2, ET1).
- *The measure of a good STEM teacher is you stand by the project at an expo with the students, it may look terrible, but if kids can explain all the skills that they learnt along the way, and why the project is the way it is. There's stuff you can't measure, it's not valued, which is really wrong; problem solving, relationship skills, budgeting, all those soft skills. So with project work, you develop all these skills* (Site 2, ET).



**TABLE: 7.2 Professional claims 'Assertive Resistance'** in a STEM planning context. Teacher confidence and competence as a reflective practitioner

*One of the things that I felt we needed was to value the process and what I tried to do as the leader was to give them the time to do their work, but also kept on their case …… to value their work and also ... provide them time* (ET, Site 1).

*So once I got my head around that, we're all part of a big thing, and this is our spot in it. ….. You have to actually let go of that ownership of it and be willing to take in viewpoints of other people.* (ET, Site 1).

*I think the one good thing the last boss did, he allowed you to take risks. I used to say to him, I don't know exactly what I'm going to do but I know it's going to be good, and he'd support me* (ET, Site 2)

*You can run the world with a packet of biscuits as long as you just keep giving to everyone, ……. What I mean by that, people don't ask for a lot, just to be recognised, and they're happy* (Site 2, ET). *If someone has 0.6 of their time, three days a week, to do a job, they'll do a great job. You give 0.2 to three people in a school; the school will steal that time. We're in the dark ages in schools, especially with people management, we're just burning people all the time* (ET, Site 2).

*I really think that linking the curriculum to real-life situations is the most meaningful way to teach kids. I think the kids respond, especially our kids, respond because it becomes quite tactile, they're able to use their hands as well.* (ET, Site 2).

**Data was collected at STEM site 1**, as part of a Group Discussion with four teachers. Two experienced teachers (ET), a science Coordinator and two early career teachers (ECT). This school was part of the State STEM Strategy and teachers had engaged in STEM professional learning for three years. They talked about resistance in making it happen and they suggested that STEM, for some teachers was beyond what teachers should be expected to do. The responses they were receiving included:

> *okay, I don't want to learn about integrated learning programs because that's a lot of work, and I need a lesson plan for Monday. I don't need your philosophical mumbo-jumbo, I've got a barbeque on Sunday, and I'm teaching Maths on Monday. I need something to do on Monday* (ET1, 534).

Those teachers opting into STEM, however, agreed,

> *our end goal is to build a piece of artwork. We have to learn a bit about Science, we have to learn a little bit of Maths, we have to do a bit of Art, we have to do a bit of Tech and so each of us had to go and plan the curriculum around that*

In response to this statement the Art teacher stated that,

> *for us the constraints were, you're only designing it, and we wanted to* make *it as well. That was something I had difficulty getting my head around. So once I got my head around that, and then I thought, no, we're all part of a big thing, and this is our spot in it* (ET2, STEM Site 1, T256).

Teachers talked about designing together, but it was more a case of responding to an agreed key idea and designing and implementing the parts of the project separately and in relative isolation within separate subject areas and then teaching towards an agreed imagined 'product'. This is the silo 'integrated STEM approach' where the 'disciplines are taught separately and subjects keep the domain knowledge within the confines of each discipline' (Roberts, Cantu, 2012, p.2).

Merely 'linking or juxtaposing discrete subjects together around a theme', which reflects the approach described by teachers at STEM site 1, is not interdisciplinary learning but, more of a multidisciplinary approach that 'may fail to convey transferable and applicable disciplinary knowledge and understanding' (Harvie, 2014, p.3). Changing education to address complexity, diversity, uncertainty and inequality of twenty-first century societies conveys the challenge that confronts us all. 'Changing education to adapt to twenty-first century economic imperatives' is not enough to achieve whole school change in relation to 'complexity, diversity, uncertainty and inequality', including how teachers plan, learn and teach (Harvie, 2014, p.2). How teachers collaborate is a key consideration for moving toward resolutions, not just in relation to complexity and interdisciplinary planning and learning but also in relation to other imperatives confronting education.

Teachers in one of the case study sites discussed that in the following year the school would include two STEM classes; one at year 8 and one at year 9, with an understanding that 'project work' was the focus. So STEM progress at the school had been defined and had achieved timetable status yet the structural reform issues, including how teachers plan and collaborate, was not part of the vision of the decision makers or teachers. Building teacher capacity 'to collaborate' as part of future project work across subjects integrated, had not been resolved. The status



was that individual teachers were responsible for the planning of STEM classes and, if timetabled concurrently, teachers involved would be able to share expertise which could include some collaborative planning time, but perhaps not time enough for the rigorous deep planning that can inspire creative pedagogical resolutions as identified by Andreotti and Pashby (2013, p.8). For example, in Case study 2:

> *The importance of designing learning has to be felt by people above as well because we can be enthusiastic about it, but unless everything else is working, when we come to doing the task design …the leaders were the ones who had to actually make sure that everything was in place so that we could get to designing the task. The time given for planning is significant and it means that you never get too busy to talk to colleagues about what's happening, and I think that is something really valuable* (ECT, STEM Site 2).

This teacher felt totally responsible for STEM at the local level and felt the efforts of senior members of the STEM team were not reciprocated.

Consensus in a collaborative design context changes the control of that knowledge (Sennett, YouTube, 2012). Successful STEM in schools is about consensus and achieving a more equitable distribution of power in terms of curriculum decision-making. Equally, teachers need to be supported in the transition from 'curriculum deliverers' to 'curriculum creators'. Collaborative design potentially creates 'a perfect storm' for those working towards a more equitable distribution of curriculum power where accountability is more likely to be imposed by the team responsible for the creation of the Integrated Program itself and by individual teachers within that team.

**Transformation of teacher practice claims and teachers' core capacity to collaborate**

Table 7.3 includes teacher claims about how collaborative design has 'transformed teacher knowledge, curriculum, teaching and learning to provide innovative curriculum solutions'.

Table 7.3: **Transformation of teacher practice claims and teacher core capacity to collaborate** in two STEM sites**.**

| |
|---|
| • *I've always been big on collaborative cross-curricular teaching, and STEM has made me believe that it is really possible, but it's a huge project to change the whole culture of a school, but it's possible* (STEM Site 1, ET2, T465). |
| • *One of the failings that we have as teachers is that we have a set of curriculum documents, and we're going to start here, and hopefully along the way students learn a bit of Science, and maybe enjoy a bit of Science, whereas when we chunked (integrated) the stuff about sustainability, about recycling, about solar cars, they knew a lot. It's getting the kids out of being babysat. A lot of our students are used to, here's your worksheet, so they're not learning any independence, and they're not learning any thinking for themselves* (STEM site 1, ET, T529). |
| • *I'm an early-career teacher, this is the end of my third year, and in the first year you hit the ground running and head down and you're just desperately trying to keep work to the students, and so I planned things very separately and individually, but through being involved in a couple of these projects I'm more willing to float some of my ideas with colleagues before I actually do them. Normally I just trial it with my class, and then I can say, hey this worked, and then share it, but I'm a little bit more willing to go, oh, what do you think about this idea? Then when the ideas are implemented its better quality because I've got other people's input and ideas* (STEM site 1, ECT, T600). |
| • *I am into the physiology of the brain stuff and 'If your bum is numb, then your brain is numb' and if instruction time goes more than two or three minutes (Year 8 class) then you're going to lose the kids, and this cross-curricular, working collaboratively, project-based learning, self-directed learning, works beautifully with this, and if you can tie it in with what the kids' interests are; their schoolbags of knowledge, it works really well* (STEM Site 1, ET, T649). |

Despite some positive integrated STEM design experiences in these sites, teacher belief is that the experience is not sustainable because people are 'too busy' and 'leadership inactive' and the possibility of creating a 'planning narrative' culture or 'structural changes' is improbable. At site one

> *as great as collaboratively planning a unit of work is, the only downfall with it, is that schools are busy places, other people have other commitments that are happening at the same time, and they just can't commit to it, so then it will fall to someone else, and sometimes it ends up that one person has to really take the lead* (STEM site 1, T293**).**



The four teachers at STEM site one pointed out they had 'proven the value of it and that students had been really engaged in what they had been doing in the STEM subjects integrated'. Teachers stated 'students

> *didn't miss a lesson, and they were asking, where can we go next, so we invited them to a sharing day, and the kids stood up and spoke about what it was, and that was almost 12 months later, so they actually stood up in front of a group of teachers and told them what they did* (STEM site 1, ET2, 360).

**Dimensions of Professional Autonomy in STEM planning context**

Achieving teacher autonomy in STEM contexts needs to be part of a much broader focus on teacher professionalism including a focus on knowledge sharing, collaboration and networking as outlined in the OECD Teacher Professionalism Index (2016).

Table 7.4: Dimensions of professional autonomy in two STEM sites

| ***'The 'will and capacity to justify and develop core practices' statements*** |
|---|
| - *It's good working in multi-disciplinary teams, but you need the time.*<br>- *When I was writing curriculum I actually felt that I needed to deliver that curriculum. If you're going to write curriculum you actually have to have a relationship with kids, and I really struggled with the people who sit in ivory towers and write curriculum and say, now teach this* (STEM site 1, ET, 812) |
| ***'The will and capacity for self-governance' statements*** |
| - *Susanne and I have had a number of conversations and we made a commitment to do something again, with Maths, Science and Art basically. We've got that in there for next year.*<br>- *We had a coordinator and three teachers, so we had these four teachers to run three classes, which worked really well. I coordinated to start off with because I was a Coordinator, and said, Righto, Sammy, you coordinate it and I'll be a teacher. The first thing she does… sets up a website, then she set up all the booklets, everything, like it was just fantastic, every link went to the website and they could work outside of school, they could do everything.*<br>- *Next year we will have two STEM classes, year 8 and 9 and will be looking at is some collaborative stuff for those subjects and the other thing that I would really like to do is to share that because I'm a big fan of project-based learning and I want to be able to share some of that in other Science classes.* |

The autonomy of teachers, individually and collectively to share expertise and plan learning is essential in developing STEM planning and learning cultures where 'sharing expertise is easier if teachers know how their colleagues from different faculties and disciplines describe their own knowledge and competence' (Solonen, 2015, p.3). Interdisciplinary thinking and planning is 'the point where individuals and their contexts meet' (Bussey, 2009, p.29) and where teachers 'dwell in ambiguity' (Sennett, YouTube, 2012) to explore knowledge boundaries. If schools and site leaders are not able to support teachers to 'dwell in ambiguity' in STEM planning contexts teachers wont be able to make the most of the STEM professional learning available.

**SUMMARY**

Salonen et al suggest that 'the most important elements of a teacher work is co-operation when constructing, de-constructing, and re-constructing knowledge; planning together; team teaching' (2015, p.8). This is familiar territory to many teachers. The design experience of teachers in the STEM sites, affirm 'the mutual core competence of a teacher … to interact effectively' (2015, p.8) and affirms teacher belief in what can be achieved by integrating STEM subjects, professionally and personally. For example, when a teacher describes a 'planning relationship' as a 'celebration' "because we helped each other out so much" (STEM Site 2, ET, T313), the sense of what can be achieved is very authentic. However, the opportunities in top-down, professional learning models in many schools are shaded with comments such as 'schools are busy places', 'people have other commitments that are happening at the same time', 'you've got to have the right staff',' logistical things need to be in place', 'the previous Principal supported integration, this one is into explicit teaching'.

STEM progress in the two STEM sites appears conditional on structural considerations identified by teachers, including '*leadership valuing the complexity of synthesis of subject STEM content'... 'time for interdisciplinary thinking, planning and maintenance of an integrative synthesis of knowledge culture'* as well as achieving a more equitable culture where teachers do not have to *'push against schooling leadership stereotypes so teachers feel supported to make curriculum decisions'* (ET1, STEM Site 1).

Although not clearly articulated officially, the evidence provided in this case study, clearly states 'teacher capacity to collaborate' is a key determinant of STEM success and, it is challenging for schools to achieve because it requires an interrogation of existing structures and changes to the organisation of schooling to enable teachers to share



knowledge and expertise across subjects to plan learning. A focus on teacher collaboration as part of the articulation of STEM policy, strategy and resourcing is required to build professional capacity; teacher knowledge, autonomy and teacher capacity to collaborate in STEM contexts as included in the OECD teacher professionalism index (2016).

Teacher autonomy too is dependent, on internal versus external controls. Teacher comments suggest that STEM work is understood largely as externally controlled in these STEM sites and the role of the teacher is mainly about meeting state and national STEM goals rather than a focus on teacher practice and site priorities that are internally rather than externally driven. Teachers in the STEM sites make limited comments about 'professional autonomy' related to 'the will and capacity for self-governance and the will and capacity to justify and develop core practices' (Mausethagen et al, 2015, p8). This is in contrast to teachers in the key case study sites who recognise interdisciplinarity planning as an opportunity to embrace autonomy opportunities, individually and collectively. Fullan, Rincon-Gallardo and Hargreaves (2015, p. 1-2) agree and advise a major shift from reliance on external accountability, and in this scenario, external professional learning practices and accountability systems, to a focus instead on building the professional capital of all teachers and leaders. They suggest

> the development and circulation of professional capital that consists of individual human capital, social capital (where teachers learn from each other), and decisional capital (developing judgment and expertise over time.

Collaborative design practice is centrally about 'the development and circulation of professional capital' (Fullan et al, 2015, p1-2). As a system we need to ensure this 'capital' finds innovative ways to circulate constantly, as is evident in contexts where teachers are engaged in collaborative design work.

# CHAPTER 8

## AN HOLISTIC ANALYSIS OF THE DATA

### INTRODUCTION

As part of a process to reflect on and analyse data to reveal links to the key questions to be answered in chapter 9, this chapter is presented in eight sections; and together an analysis of each section provides insights about key learning from the study. Each section is designed as a stand-alone contribution for professional discussion at a school or in policy settings. Data from each of the case study sites is integrated to provide an holistic analysis as well as opportunities for focused discussion about key considerations related to the creation of Integrated Programs. Additional sources of data, other than sources identified in each of the key case study chapters, are also included in this chapter's analysis. These include data contributions from four sources including from the Aboriginal women's workshops about reclaiming traditional Aboriginal values and knowledge and an analysis of official SACE data about the subject 'Integrated Studies' in the absence of specific data about the 'Integrated Program' SACE option. There is also a detailed description of an integrated planning process from one of the case study schools and analysis too of teacher dispositions, motivations and school culture factors impacting on teacher engagement in collaborative design practices.

An holistic overview of data highlights the rich learning involved for teachers designing learning collaboratively, Those engaged in designing learning collaboratively are positioned to pay *'attention to the details'* of teacher practice and create future opportunities for more collaborative ways of planning learning and being a teacher (Donohoo, 2017). Because the analysis is presented in sections inspired by key statements from teachers and the literature, this form of organisation allows for opportunities to reveal links and resolutions related to teacher efforts to collaborate to design learning. In the concluding chapter, key learnings are presented and aligned with the key questions.



In this chapter and the final chapter, identification of comments by teachers participating in the study makes reference to the specific role of the individual making the comment (Principal (P), Teacher Leaders (TL), Experienced Teacher (ET), Early Career Teacher (ECT), Aboriginal Leader (AL) and does not include reference to specific case study sites or transcripts as identified in each of the key case study chapters.

### OVERVIEW OF SECTIONS IN CHAPTER 8

The first section brings together contradictions that impact on teacher practice, ranging from policy and practice struggles that make working in collaborative ways unnecessarily complex, to practice issues associated with the dominance of disciplinary knowledge standpoints in schooling and the invisibility of interdisciplinary knowledge and teacher expertise in interdisciplinary planning contexts.
Section two focuses on capacity building through engagement in collaborative planning practices. This summarises data about how schools develop the capacity of teachers to collaborate when 'capacity building' is 'any strategy that increases the collective effectiveness of a group of teachers' (Levin et al, 2008, p.295)

Section three analyses official SACE 'Integrated Learning' subject data, 2012-2017, in the absence of official public data collected about 'Integrated Programs'. Data on the stand-alone subject 'Integrated Learning' are used for the purpose of providing evidence about teacher interest in interdisciplinary planning.

Section four describes the potential of teacher as knowledge builder/creator and schools as 'knowledge building organisations' and section five is about the summary survey completed by the teachers interviewed which provides data about teachers' 'personal dispositions', 'motivations' to collaborate and school cultural factors that enable collaborative solutions. Most significantly the survey provides data about teacher intentions to seek future collaborative design opportunities.

Section six provides a detailed description and analysis of interdisciplinary planning processes, structural considerations and school organisation factors that enable collaborative planning in a case study school. Section seven has been written in consultation and collaboration with Aboriginal women education leaders. It provides a discussion about the parallels between interdisciplinary knowledge work and Aboriginal values and knowledge creation practices in mainstream planning contexts. Working with interdisciplinary design considerations demands a range of perspectives and Aboriginal

value systems and knowledge systems are identified as an important means to articulate and describe the complexity of interdisciplinary design work. Section eight analyses the metaphors teachers use to describe their collaborative design experience.

## SECTION 1:

## CONTRADICTIONS IDENTIFIED IN COLLABORATIVE DESIGN CONTEXTS.

Engeström's Activity Theory research model of expansive learning (2000, p.960) includes the identification and analysis of contradictions. Working with and managing contradictory demands and ambiguities is generally accepted as routine practice for teachers in our schools. Contradictions identified in this study have placed unnecessary demands on teachers and impact on teacher practice. The identification and analysis of contradictions has provided an important source of data for this study and it implies that analysis of contradictions experienced in schools could be encouraged routinely to promote teacher autonomy and engage teachers in a practice that influences school decision-making. Contradictory policy, school organisation and any structural change that impact on teacher practice should be made visible, through teacher analysis of impacts on practice so contradictions can be addressed by site leaders and teachers at the local level – and where necessary, communicated to policy authorities. .

In this study, contradictions identified range from policy versus practice struggles, the dominance of disciplinary planning approaches, to invisibility issues for teachers choosing to work in more integrated and collaborative ways. Because of the dominance of disciplinary curriculum perspectives and the subsequent invisibility of interdisciplinary curriculum, our awareness and encouragement of interdisciplinary and collaborative work, is minimal.

For example contradictions identified across all case study sites relate to teachers choosing to design a program of learning based on a disciplinary framework or choosing to design an Integrated Program (a program that combines two or more whole Board-accredited subjects in a single teaching and learning program). For most teachers it is not a choice. Why integrate multiple subjects when there is little or no support to integrate, when it is more practical to plan learning guided by a single subject framework? Despite SACE and Australian Curriculum reforms that encourage teachers to consider more integrated curriculum approaches (Gilbert, 2011), the creation of



'Integrated Programs' in senior secondary schooling is both time consuming and complex. To initiate and sustain these practices is difficult without ongoing support and maintenance. Individual and familiar subject frameworks, therefore, continue to be the preferred planning option in senior secondary planning contexts.

The invisibility of the 'Integrated Program' option and the unavailability of Integrated Program data is contradictory and confusing, particularly if schools want to engage more deeply with integrated approaches to planning, teaching and learning. It is also contradictory to offer an Integrated Program option then not be able to assess it as a program of learning. As discussed, Integrated Programs cannot be assessed holistically because it is not recognised as a subject and as a consequence there is limited data about site, teacher and student participation in 'Integrated Programs' which does little to encourage teachers to give integrated programming a fair go.

Policy focused on individual teacher work also seems contradictory in a world increasingly determined to achieve solutions, collectively. The individual subject framework continues to suggest teachers work independently and in isolation to make planning decisions. Teachers however, know it is important to collaborate professionally if you have the time, rather than working individually. When curriculum decisions are made in isolation teachers are neither challenged intellectually or creatively and an outcome of this scenario is that ownership of learning programs is less enduring and sustainable.

The overview of the Australian Curriculum states that teachers are responsible for the organisation of learning and they will choose contexts for learning and plan learning in ways that best meets their students' needs and interests. Yet limited presence of integration, interdisciplinarity or collaboration in key State policy documents is contrary to, or does not include details, about achieving more collaborative resolutions. For example, the State Government' 'Teaching for Effective Learning document (TfEL); a state-wide policy framework to support leadership and teachers in '*Learning for Effective Teaching'* and '*Teaching for Effective Learning'* uses the word 'Integration' once only, and there are just six references to collaboration, in this 85-page document. The document has been used as a companion document to support the implementation of the Australian Curriculum in public sector schools. There are seven key messages exemplified in the document, two of which, are particularly relevant; *'co-construction'* and

'*teaching as a highly intentional act'* to remind school leaders and teachers to focus on actions that characterise effective teaching, that includes effective planning. Key messages include '*co-construction generates dynamic forms of knowledge and captures our collective intelligence as professionals. 'There is no one teaching package that fits all and think flexibly, design strategically and be on constant lookout for teachable moments'.* Collaborative, integrated and interdisciplinary planning, teaching and learning fit comfortably with these statements and this policy direction. However, because of teacher familiarity with collaboration in the abstract rather than in practice, collaborative practice receives minimal attention. The word 'integration' is used only once in the document, to describe how to express meaning (TfEL, p.53) and there are no references to multi / cross / or interdisciplinary knowledge or design practices. There are however four references to the significance of teachers developing deep disciplinary and pedagogical knowledge and teachers utilising various learning and teaching models to design learning for deep understanding and skilful action. The document suggests, for example, that teachers engage with Kenneth Wilber's Integral Learning theory, which *'suggests the synthesis of all human knowledge and experience'.* So indirectly, TfEL suggests teachers seek diverse knowledge perspectives and by association and should engage with 'other' curriculum design approaches, but it does not engage directly with collaborative design practice as a resolution.

Contradictions experienced by the Case Study sites with a focus on 'teacher time for Interdisciplinary thinking and planning' relate mainly to STEM professional development issues. For example, as a lead STEM school over a number of years, curriculum teams at the school have reconciled philosophical differences, created a culture of teacher leadership and consensus and are very comfortable in adapting policy to meet site needs, including teacher time to re-imagine STEM curriculum through integrative synthesis and organisational change. The culture and organisational arrangements at this site are in contrast to many schools participating in STEM Professional Learning. For example, 'pushback' responses are common, questioning why engage in STEM learning if leadership teams are not prepared to consider organisational or structural change so teachers can actually collaborate. 'Curriculum integration and strategic planning' are clearly inextricably linked yet after five years of STEM professional learning the failure of some participating schools to embrace strategic planning, to enable curriculum integration is a barrier to reform. Interdisciplinary thinking and collaborative planning too are perceived generally as 'good ideas' but doing something about school structures so



teachers can engage in curriculum decisions is about whole school change which ultimately requires a systemic response and a focus on teacher professionalism and collaboration.

Differences in understandings of 'integrative synthesis' at a local level, compared to a system level, creates a paradox for teachers. For example, the 'Interdisciplinary suite' of subjects is suggestive of integration and infers the potential for integration but without consensus about the details of integrative synthesis practices, implementation is unlikely. Examples of contradictions experienced included

> *Teachers are not allowed time to plan or our planning is not considered. We know it's a key role of what we do but there doesn't seem to be any systemic way of actually ensuring that it happens* (Curriculum Leader).

This statement represents teacher frustration about the invisibility of planning learning as a key area of teacher work. The fact that 'planning' is consistently not prioritised, particularly in comparison to assessment, suggests schools are not understood as 'learning organisations' nor teachers as creators of curriculum.

**Concluding Comments**

Contradictions identified here suggest schools are often overwhelmed about the lack of consistency in meeting both mandatory State policy expectations and system reform agendas at the site level. Managing the range of competing and often contradictory demands is accepted as routine practice for school leadership and perhaps even more so for teachers, but should this be the expected norm? However, when and if teachers have opportunities to collaborate, concerns can be shared and hierarchies of power and control in schooling contexts dissipated through sharing, consensus and practice in 'collaborating effectively' (Salonen et al, 2015).

## SECTION 2:

## CAPACITY BUILDING AND COLLABORATIVE DESIGN PRACTICES

This document summarises data about how schools develop the capacity of teachers to collaborate. This is followed by a summary of capacity building strategies implemented in the case study sites. The key drivers of 'capacity building' in the data are aligned with the domains of teacher professionalism outlined in Chapter 2 that include teacher knowledge (Domain 1), teacher autonomy (Domain 2) and teacher collaboration and networking (Domain 3) (OECD Professional Teacher Index, 2016).

| *Key issues identified* | *Key question arising* |
|---|---|
| Schooling is not organised around teacher work practices and teacher capacity to collaborate.<br>Disciplinary versus interdisciplinary knowledge divide. | How do schools build teacher capacity to act within and against SACE policy to develop rich interdisciplinary programs that meet the assessment requirements of individual subjects? |

This document identifies how the case study schools support teachers to build capacity to increase the 'collective effectiveness' of teachers. The literature suggests that a focus on 'capacity building' helps teachers 'create or modify public knowledge,' such as curriculum knowledge, 'knowledge that lives in the world and is available to be worked on and used by other people' (Scardamalia, Bereiter, 2002, p2). Gilbert also notes the progress of educational reform is dependent on teachers' individual and collective capacity that links to school-wide capacity for promoting student learning. (2011, p.14).

Lloyd and Mayer (2010, unpublished) differentiate professional development from professional learning and argue for a merged definition. The former refers to the activities that develop professional skills, knowledge and expertise, while the latter refers to changes in the capacity for practice or changes in actual practice (in Gilbert, 2011, p.4). This differentiation reflects the professional learning focus of this study about how teachers plan learning.

Teachers are best placed to describe the evolution of curriculum integration planning in response to the introduction of an 'Integrated Program' option in 2008-2012. The



successful application and dissemination of their efforts is dependent, however, on teacher awareness about 'being collaborative' and the implementation of 'capacity building' strategies that make the sustainability of integrated design practices more likely in a given context.

Teachers in the key case study sites are designing Integrated Programs that are *"of value to people in their current lives, not merely banked against future needs".* Collaborative design work respects the role of the teacher in creating new knowledge where 'knowledge building calls for deep constructivism at all educational levels; it is the key to innovation' (Scardamalia and Bereiter, 2002, pp.3,4), as is building teacher professional 'capacity' to 'increase the collective effectiveness of a group of teachers' (Levin et al, 2008, p. 295).

When schools focus on building teacher capacity to design learning, this decision requires leadership at the site level to consider what it means for teacher work practices and for school structures and processes that enable collaboration which in turn '*precipitates further advances'* (Scardamalia, Bereiter, 2003, p.2). So, when teams of teachers work together to design learning and then review the progress, sequence of learning, assessment and relevance of specific content of a program of learning on a weekly as well as yearly basis and are also responsible for adapting and adding new knowledge and perspectives to a program of learning, teachers are investing in something that will continue to be renewed into the future by others with new perspectives and new knowledge. Advancing knowledge concepts and processes is a celebration of teachers' core work and acknowledgement of the effort and goodwill that goes into the design of a program of learning.
Where knowledge is considered collectively, knowledge advances as does the professional collective autonomy of a team of teachers responsible for the design of an Integrated Program of learning.

> Each advance precipitates further advances; with the result that at both the individual and group level there is a continual movement beyond current understanding and best practice, toward the ideal of lifelong innovativeness (Scardamalia and Bereiter, 2003, p.2).

It is an inspirational vision worthy of our attention and its sentiments places 'collaborative design' at the centre of future curriculum reform efforts as a key driver of professional capacity building.

Addressing the complexity of the 'integrated' decision is complex, but the level of complexity does not seem to have hindered the commitment of leadership teams and teachers in the case study sites. Gilbert suggests that the range and dynamic nature of factors to be considered imply a need for strategies to address the issue of 'complexity' itself, found in literature on systems thinking (2011, p.5). For example, the key case study sites have been very committed to their primary vision for change that includes a site with a focus on *'interdisciplinary thinking',* a site committed to '*student well-being'* and a site with a commitment to *'student engagement'*. These guiding visions provide the basis for site-specific guiding truths about education in a particular context. One Principal talked about the importance of *"preparedness to problem solve around decisions made",* such as, in the case study sites, the decision *"to integrate curriculum'"* has determined other reforms made. Statements like this help to build staff capacity and guide interdisciplinary planning to support teachers to collaborate.

**Capacity building strategies implemented in the case study sites**

A summary of capacity building strategies in the case study sites are again aligned with the domains of teacher professionalism; teacher knowledge (domain 1), teacher autonomy (domain 2) and networking (domain 3)

From a 'systems thinking perspective', strategies developed in the case study sites reflect education systems as wholes, rather than as collections of parts. 'Interdisciplinary thinking', 'student engagement', 'a well-being culture' and 'STEM integration' represent 'big picture' objectives and they are also key leverage points from which the case study sites are progressing interdisciplinary and collaborative reforms. Gilbert (2011, p.5) suggests 'systems thinking [offers] a vantage point from which educators are positioned to see a whole, a web of relationships, rather than focusing only on the detail of any particular piece'.

This reflects the intent of collaborative design work and 'interdisciplinarity' itself where the emphasis on multiple interpretations of concepts and events, including curriculum, can transform existing ways of thinking, knowing and being a teacher (Andreotti, 2014, p.5). Awareness of multiple perspectives opens up possibilities for the production of new meaning, the creation of new relationships and the dismantling of existing social, cultural and disciplinary hierarchies, which is evident in the case study schools and is part of the following discussion.



Key drivers of 'capacity building' were identified in the case studies, including '**preparedness of leadership teams and teachers to problem solve around the decision to collaborate** to design learning' (Domains 1,3) and 'paying *attention to the details*' about decisions to collaborate. Preparedness to problem solve and pay attention to the details are particularly complex practices but necessary if schools are to reject individualised 'practice architectures' (Kemmis, 2009a) and focus on advancing teacher influence and autonomy in schools. Across the case study sites 'there is a continual movement beyond current understanding and best practice' (Scardamalia and Bereiter, 2003, p.2).

Site leaders emphasised their '**commitment to interdisciplinarity'**. They talked about interdisciplinarity as holistic in relation to both curriculum and professional relationships. They described it as defining who and what they are as a community of educators (Domains 1,2,3). **'Making time for interdisciplinary thinking'** is also about a **shared vision**, as is the development of a **shared language**, evident in conversations with teachers at one site in particular. The provision of a designated **space and time for professional collaboration**, professional development and for teachers to work in **autonomous teams** with self-governance responsibilities is part of the organisational and structural change initiated in case study sites. Team responsibilities for example, included responsibility for designing the curriculum, implementing that curriculum and, in one site, it also included teacher recruitment and timetabling (Domains 1,2,3).

**The promotion of a contributive leadership culture** across the case study sites is also a priority, where teacher leadership rather than performativity (Bourke et al., 2013) is the intended outcome. Site leaders in 'collaborative design contexts have organised teachers into teams and each team has input into the decisions that are made around teaching and learning in an innovative space. These groups are ultimately responsible for designing learning across the disciplines according to an agreed site processes (Domains 1,2,3). Teacher comments generally reflect teacher interest in 'leadership' and enthusiasm for potential reform efforts in relation to collaborative design practice.

> *There's big problems in Maths education about how to address very abstract things and how do you organise a curriculum around usefulness and utility to the student. So, I've got ambitions that I will crack those problems to get great engagement in Maths across the year levels* (ECT4, T895).

**Evolving leadership roles** at the school also contribute to the development of an interdisciplinary thinking and learning culture that supports teachers to collaborate professionally and informally. A Curriculum leader talked about the roles of the Director and Assistant Director of 'Professional Learning at the school which cover teacher work and the logistics around getting teachers together (Domain 3). Collaboration as a practice is recognised and formalised through teacher roles that specifically focus on bringing teachers together to engage in interdisciplinary thinking and planning.

**Collaborative teacher decision-making** too has been made a priority in relation to the organisation of one of the case study schools and is featured as part of every teachers' personal timetable. So, despite the complexity of finding time for collaborative design work on a regular basis, one of the teachers with a responsibility for making time, talked about timetables that included

> *Teachers sitting around the table together at meetings each week for at least 100 minutes and there's the expectation that teachers will be involved [in curriculum thinking, planning and review and maintenance of programs created] and that they won't miss a meeting.*

**To** build teacher capacity, another school focused on **changing teacher mindsets from curriculum deliverers to curriculum creators**. The challenge was to transform how teachers viewed learning and their role within this process and how to build teacher capacity to engage in major structural reform to precipitate curriculum reform. It involved a focus on building teacher knowledge both locally and internationally (Domain 1) and challenging teacher 'practice architectures' that inhibit teacher engagement in progressing the school's vision about student engagement. A teacher leader described the challenge as a big learning curve

> *Changing mindsets from curriculum deliverers to curriculum creators was like Tiger Woods spending a year un-training his golf swing before he could retrain and so unlearning what teachers have experienced and relearning alternative integrated ways to teach. It's hard'* (Curriculum Leader).

The strategies described by teachers at another site are articulated with reference to Gonzalez (2014).

**'Networking for systemic emergence of reform efforts'** and engagement of teachers in reforms supported by national large scale 'collaborative inquiry' initiatives about student engagement, support planning for learning that is connected, co-created, integrated and personalised (Learning Frontiers, 2013). One of the case study sites simultaneously supports local Learning Frontiers initiatives as well as mandated



government reforms. For example, all staff at this site were encouraged to seek and participate in national trials and 'design hubs' so as to contribute towards the school's vision about student 'engagement in learning' (Domains 1,2,3).

The leadership team was also very keen to discuss the schools focus on **nurturing 'less insular education attitudes'** (Domain 3), so that teachers are more likely to pursue flexible learning spaces and develop learning networks that provide teachers with confidence and motivation to engage students in learning that in turn may lead to further teacher engagement in reforms. **Prioritising professional collaboration opportunities** at this site was the foundation for transforming teacher practice.

> *Governing Council ensured that teachers get out and see what's going on, and every teacher has opportunities to go to schools interstate, overseas, with other teachers, looking at what's going on, building their capacity, in teams. They always go for multiple days, never for a day. That's the culture (Domain 1, 2,3).*

In another key case study site teachers are encouraged to identify student well-being needs or gaps in student learning and **routinely seek ongoing curriculum resolutions.** This is recognised as an opportunity for teachers to create Integrated Programs and promote students as active participants in planning their learning**.** The well-being of students comes first at this site as do relationships-based approaches to learning (Domain 3) that underpins cross-disciplinary planning and the subsequent creation of integrated learning packages (Domain 3). The well-being vision has consolidated teacher resolve to achieve holistic and connected learning experiences for senior secondary students. **Deep awareness of the school's well-being priorities** continues to drive the actions imagined and implemented (Domain 2). The Principal stated

> *It is firmly embedded in everybody's brain about how it works in a complex school that all students need to be on board about the fact that they're not buckets that we're going to fill, they're going to be active participants in the learning.*

The learning programs that result are aimed specifically at providing a supportive learning environment for students' ongoing learning. The circular logic to this strategy is in keeping with Aboriginal knowledge circular logic practices that encourage teachers to revisit curriculum priorities for groups of students. It involves repetition and returning to concepts for deeper understanding, and cyclic views of time and processes. It is a complex form of reasoning but it provides a narrative that could be part of professional discussions to support the learning needs of marginalised student groups. Leaders at this site strongly respect the **capacity of teachers to seek and initiate education**

**resolutions** and, as a result, have adopted **a 'bias for yes' to teacher initiated integrated curriculum ideas** (Domain 2).

> *So if someone says, I'd like to do this, we don't start from the position of, these are all the reasons it won't work; it's like, yes, work out how … and then come back with a proposal...*(SL,T412).
>
> *You can't have curriculum innovation if you're going to say no to everything. You've got to let people imagine the possibilities* (SL, T415), (Domain 1, 2).

The capacity of leadership teams to embrace change as a priority is backed up by an understanding that **once the decision to embrace a more integrated curriculum had been made, it was critical to be prepared to problem solve around this decision**, without thinking about all the structures in place that may stop it from happening.

**'Respect for teacher knowledge and teachers' 'gut feelings for what may work'** is demonstrated through the experience that teacher ideas are actively listened to and implemented. Leadership teams need to be able to show respect for the capacity of teachers to lead curriculum reform (Domains 1, 2), at the local level as active participants in imagining, planning and implementing curriculum.

**Articulation of essential protocols** including the use of time in schoo**ls** helps realise a school's vision. In the key case study sites, this includes a school vision about 'interdisciplinary thinking', 'well-being' and 'student engagement.' For example, it is very significant to hear a Principal talking about the provision of '*teacher time to fully understand the curriculum that they're working with; time to imagine the opportunities within it; and time to be creative in how that's going to be planned and implemented'*. These capacity building strategies are ways to support teachers' own leadership with relative autonomy to make decisions and collaborate so that they are able to see a bigger picture through multiple perspectives (Gilbert, 2011; Andreotti, 2014).

The STEM reform case study is in contrast to the other case studies. This State's STEM professional learning strategy promotes an integrative synthesis and structural change philosophy to encourage teachers to share ideas' and create integrated STEM programs (Domains 1, 2). However, the structural change to enable collaborative design resolutions and progress teacher influence is not strongly articulated by teachers in the STEM sites, compared to the key case study sites. However, at the individual teacher level, teachers are keen to collaborate to forge professional relationships. Unless this is supported by other capacity building strategies such as those identified in the key case study sites, STEM integration can place unrealistic expectations on teachers.



Sennett reminds us that 'cooperation is a skill that takes patience and practice. He refers to Sen and Nussbaum who believe 'society should enlarge and enrich people's capabilities, most of all their capacity to collaborate; modern society instead diminishes it' (2012, p.192) as do some schooling contexts where teachers are often more dependent on the objects of education created somewhere else, than on one another as knowledge builders and creators. When teachers design learning together they share and reciprocate and it is these forms of communication that are the basis for what Sennett describes as the 'development of a community of equals' (YouTube, 2012) where teachers can be supported to develop a sense of mutual obligation, shared responsibility and ownership. Collaboration results in a more equitable distribution of power and resources, as the comment by a STEM Coordinator shows:

> We were planning together and when shopping*,' oh, Sam needs some of those bamboo things – take a picture and send to Sam. Sam, do you need some of these? ... Yeah Tony, get me some, like that sort of thing". He described the scenario as "almost celebrating a relationship, a teaching relationship, because we helped each other out so much* (STEM Site 2, T312).

Teacher capacity to collaborate is critical to advance *'science literacies'* or *'scientific habits of mind'* because collaboration in its many unarticulated forms will ultimately *'stimulate and propel innovation that remains latent in many schools'* (Leavy, 2012, p25). (See Appendix #5, 'Collated capacity Building Strategies.)

**Concluding Comments**

Synthesis of knowledge is central to collaborative design practices and is described by Sennett as 'a complex listening and understanding process that recognises other, and what the other is actually saying'. 'The idea in interchanges, to design learning, is to attend to what people are thinking and feeling' as well; what Sennett describes as 'stranger knowledge'. He adds, it takes skills to attend to these skills; skills to uncover what is not being said (YouTube, 2012) so we can collaborate and communicate.

Donohoo (2017, Blog, January 9th) lists six capacity building strategies that include 'advancing teacher influence', 'teacher knowledge about other's work', 'goal consensus', 'cohesive staff cultures', 'responsiveness of leadership' and 'effective systems of intervention' as strategies and conditions most likely to achieve collective efficacy. 'Collaborative design' could be added to Donohoo's list of leverage possibilities for the emergence of teacher capacity to collaborate.

This study suggests the most influential capacity building resolutions are about communicating with others about ideas. This interrupts teacher practice architectures as well as hastens consideration of structural change. Sennett agrees, suggesting synthesis of knowledge collectively 'changes the control of knowledge' and potentially triggers momentum for more change (YouTube, 2012). Building capacity through discourse and collaborative design is this study's contribution to understanding capacity building and collective excellence research in schools. Capacity building around teacher collaboration, although talked about in policy, in practice, however, collaboration remains on the periphery of policy options to invigorate teaching and learning.



## SECTION 3:

## SACE 'INTEGRATED LEARNING' SUBJECT DATA (2012-2017)

| *Key issue identified* | *Key question arising* |
|---|---|
| Limited 'Integrated Program' official (SACE) data. | How do schools increase the collective effectiveness of teachers working within and against SACE policy to develop rich interdisciplinary programs that meet the assessment requirements of individual subjects? |

All stand-alone subjects in the SACE are reported upon in terms of student enrolments, achievement and school subject options. However, Integrated Programs are not included in this data collection scenario. It is thus difficult to gauge the numbers of schools and teachers engaged in this work. In the absence of official public data about 'Integrated Programs', data about the stand-alone subject 'Integrated Learning' is used in this study for the purposes of providing some evidence about teachers working in more integrated ways.

The SACE Review (2006) recommended there needed to be opportunities for teachers *'to develop and have accredited, comprehensive integrated learning units and programs'* (Crafter et al, 2006, p.79). The Review stated, *'learning unit frameworks should include a mechanism for interdisciplinary or trans-disciplinary learning'* (Crafter et al., 2006, p.112) that enable students to undertake interdisciplinary study.

The SACE has accomplished such mechanisms, but there remain key accreditation and assessment issues related to the Integrated Program option that are yet to be resolved. Over time, for example, the Integrated Program option has become increasingly invisible in terms of its accessibility by early career teachers outside of sites that have already committed to the Integrated Program option. Without promotion of this option, early career teachers in particular will inevitably choose a single subject framework subject such as 'Integrated Learning'. This stand-alone subject can be integrated with other subject content to design an 'Integrated Program'. This is a variation on the 'Integrated Program' approach that combines whole subject content and assessment requirements. Because of this added complexity, it is more likely that teachers will seek other expertise, which increases the likelihood of teacher collaboration. Data on the Integrated Program

includes the number of students enrolled as well as completed student enrolments, (2012 - 2017), which gives an indication of student and teacher interest in planning learning in more integrated ways. This discussion contributes therefore to 'how teachers work within and against SACE policy to develop rich interdisciplinary programs'.

The most significant indication of both teacher and student interest in subjects that offer increasingly integrated learning opportunities is the SACE Board's decision in 2013 to allow students to complete an additional Stage 2, 20 Credit, 'Integrated Learning' stand-alone subject as part of SACE completion requirements. This study suggests that the decision to do so was influenced by the number of students choosing to do this subject and by teacher interest in being able to determine the focus of a program of learning. Successful 'Integrated Learning' SACE outcomes achieved by students in this subject may also have contributed to this decision (see Tables 21 and 22: completion enrolment data, below)

In terms of teachers working within and against SACE policy to develop rich interdisciplinary programs, teachers expressed disappointment and a level of perplexity about not being able to continue with a collaborative interdisciplinary learning design approach to planning, teaching and learning at year 12. So despite site leaders and teachers explaining that an 'interdisciplinary vision defines everything' they do, and claims too that 'the SACE itself has become 'a barrier to true integration', teachers nevertheless achieved a relatively smooth transition for students from year eleven to the final year of schooling.

An early career teacher suggested

> *some of that tension about teaching year 12 students is mitigated because of teacher capacity to collaborate as a result of existing group planning structures and moderation processes* at the site level.

Teachers stated that students expressed a certain level of disbelief about 'why opportunities for learning felt different and why it is necessary to take a disciplinary approach at year 12'.

Teachers are often willing to compromise beliefs about interdisciplinarity so students can meet assessment requirements of individual subjects integrated. Teacher compliance with SACE regulations therefore can be understood as a barrier to interdisciplinary and collaborative reforms. This suggests that policy decision-making is not paying attention to



the details of teacher practice and interdisciplinary emergence in senior schooling contexts.

Existing curriculum policy therefore needs to better reflect the decisions teachers and students are making about interdisciplinary knowledge and its place in the senior years of schooling, as is reflected in completed student enrolments in the subject Integrated Learning.Table 8.1 below.

Table 8.1: Integrated Learning, Stage 1, 10 @ 20 credits, completed enrolments

| *Year* | *10 credits* | *20 credits* | *Total complete enrolments* |
|---|---|---|---|
| 2012 | 10,175 | 133 | 10,308 |
| 2013 | 9898 | 99 | 9997 |
| 2014 | 8917 | 236 | 9153 |
| 2015 | 8158 | 176 | 8334 |
| 2016 | 8287 | 296 | 8583 |
| 2017 | 9707 | 293 | 10,000 |

'Integrated Learning' data provides evidence of the growing teacher and student interest in interdisciplinary approaches to planning, teaching and learning. See table 8.1, 20 credit, enrolments', at Stage 2, 2012 to 2017 have doubled since being implemented in 2012. Completed Integrated Learning data, Stage 1, 10 credit enrolments, (2012-2017) have remained relatively stable and in comparison to other subjects, enrolments are particularly high.

Because the 'Interdisciplinary suite' of subjects includes two compulsory 10 credit subject requirements that include at Stage 1, the Personal Learning Plan (PLP) and at Stage 2, the Research Project, student enrolment rates are expectedly high (Table 8.2). Completed Integrated Learning enrolments however, are also consistently increasing since the introduction of the newSACE, (2012-2017) See Table 8.2 below.

Table 8.2: Integrated Learning A (ILA) and B ILB), Stage 2, 10 @ 20 credits, completed enrolments 2012-2017

| *Year* | *10 credits* | *20 credits* | *Completed enrolmer* | |
|---|---|---|---|---|
| 2012 | 372 | 1223 | 1596 | 1596 |
| 2013: 2X (20 credit) 'Integrated Learning' introduced (I.L. & I.L.2 | ILA 498 ILB 153 | I LA 719 I LB 524 | 1217 677 | 1894 |
| 2014 | ILA 473 ILB 188 | I LA 686 ILB 612 | 1159 800 | 1959 |
| 2015 | ILA 761 ILB 120 | I.LA 887 ILB 576 | 1648 696 | 2344 |
| 2016 | ILA 815 ILB 108 | ILA 782 ILB 582 | 1597 690 | 2287 |
| 2017 | ILA 1119 ILB 125 | ILA 779 ILB 667 | 1898 792 | 2690 |

Significantly, completed enrolments in Integrated Learning A and B has nearly doubled since 2012. From 1596 in 2012 to 2690 completed enrolments in 2017. This is due in part to the introduction of an additional 'Integrated Learning' subject option at Stage 2 of the SACE. This study suggests that completed enrolment growth is also the result of a framework, in the form of 'guidelines' that offers teachers and students a level of design decision-making autonomy and opportunities to work with knowledge from across the disciplines.

The 'Integrated Learning' subject framework also encourages students to be collaborative. A description of the subject encourages teachers to provide learning opportunities that contribute to collaborative thinking and ways of working' and the 'sharing of ideas and informed opinions in groups, family, and /or community' settings (SACE Board, 2019, n.p.). Table 8.3 below shows completed enrolments across the range of Learning Areas.



Table 8.3: Number of completed enrolments 2017 in the various Learning Areas (Stage 2, 20 credit subjects) Total Student enrolments Stage 2: 2,723

| Learning Areas | Number of learning area subjects | Completed enrolme |
|---|---|---|
| English | 5 | 1124 |
| **Cross Disciplinary** | **4** | **729** |
| Business Enterprise, technolog | 12 | 523 |
| Arts | 6 | 373 |
| Science + Agriculture/Horticult | 12 | 325 |
| Mathematics | 5: (includes a compulsory 10 cred Maths subject) | 227 |
| Health & PE | 6 | 204 |
| Humanities / Social Sciences | 15 | 187 |
| Languages | 40 | 126 |

The participation and completed enrolments at Stage 2, 20 Credit subjects in the Cross Disciplinary Learning Area includes the subject 'Integrated Learning'. Compared with more familiar learning areas, other than English, completed enrolments in this area of learning are significant. There was a total of 729 completed enrolments in the Cross-Disciplinary area of learning and the learning area with the most completed enrolments was English with 1124 completed enrolments. The 'Integrated Learning' subject framework therefore is offering an option that makes sense to a lot of teachers and students and is contributing to 'second chance' opportunities for students who have difficulty meeting required standards in the compulsory subjects. This means teachers can convert student learning achieved in one area of learning, to a subject framework, like 'Integrated Learning' that includes integrated and personalised learning opportunities that can be aligned with student interests and strengths. Students are still required to meet the standard for compulsory subjects but the 'second chance' approach means students can be credited with work already achieved so their efforts count for something. The strong completed Cross – Disciplinary suite of subject enrolment and completion data suggests 'Integrated Learning' (the subject) and Integrated Programs (the Program) is helping students achieve the SACE and teachers are interested and prepared to plan in more integrated ways. Further research is required to substantiate this.

**Concluding Comments**

The Integrated Program is successfully supporting teachers, as curriculum creators, to explore beyond the boundaries of a mandated curriculum but there remain unresolved barriers to future exploration despite the universal focus on STEM integration and strategic planning processes. Collaborative resolutions in practice, this study suggests,

challenge disciplinary and individualised planning cultures. Interrogating related data, as discussed in Section 3, from the number of students enrolled in the stand-alone subject framework, 'Integrated Learning' appears to meet the planning needs of teachers and the learning needs of a diversity of students. The SACE Board too has recognised the role it plays in supporting student success in the SACE and has therefore scaled up opportunities for students to complete an additional 'Integrated Learning' subject at Stage 2. This acknowledgement of success is an example of a system using the wealth of knowledge that exists in teacher communities to generate student success in the senior years of schooling. Integrated Programs are generating, not just contributing to student success but also to teacher professional success (teacher knowledge, autonomy and networking capacities), vital outcomes of any curriculum reform agenda.

Teachers are embracing the 'Interdisciplinary suite' of subjects, especially 'Integrated Learning'. They are voicing their approval about a subject that offers a significant level of teacher autonomy to make curriculum decisions and engage in 'interdisciplinarity' thinking and learning. However, because it is a single subject framework it is less likely that teachers are using 'Integrated Learning' as a platform for collaborative design and 'collective excellence'. There is potential in existing SACE frameworks, to use these frameworks to progress teacher professionalism through working deeply with knowledge, with opportunities for collective design autonomy and through collaboration with peer networks.



## SECTION 4:

## TEACHER AS KNOWLEDGE CREATOR

| *Key issue identified* | *Key question arising* |
|---|---|
| Dominating disciplinary standpoints and the Invisibility of interdisciplinary expertise | How teachers collaborate for knowledge creation (teacher as knowledge creator) |

This document examines transcript data from all of the key case study sites about what teachers say about interdisciplinary planning and teacher as knowledge builder / creator. Details are also provided about the expertise required to create interdisciplinary programs. Data on the expertise of teachers is aligned with the domains of teacher professionalism and 'knowledge building' theories. The production of new knowledge is also discussed and links are made between the production of new knowledge and teacher collaboration to design Integrated Programs.

> *How people collaborate for knowledge creation has become an important educational goal* (Chan, 2011, p.147).

More details are required for how teachers create interdisciplinary programs of learning. Evidence is based on teacher statements about their learning and their interdisciplinary expertise; and learning as the production of new knowledge. This is in addition to learning as *'acquisition',* moving to learning as *'participation'* (Paavola and Hakkarainen, 2005, p.1).

Paavola et al suggest the 'Knowledge Creation' metaphor is used where the creation of new knowledge becomes a necessity, as in interdisciplinary planning contexts where the creation of unique Integrated Programs is understood as important. The shift from learning as acquisition, where teachers accept the boundaries of the mandated curriculum without rigorous consideration about how knowledge is generated and applied within programs of learning, to 'knowledge creation', where knowledge from diverse subjects is integrated to create connected, relevant learning experiences across subjects, is driven by the perceived relevance and importance of interdisciplinary knowledge perspectives by teachers and leadership teams in the case study sites. For those involved, interdisciplinarity knowledge creation practices and collaborative design practices have evolved out of necessity and logic.

In integrated programming contexts, teachers collectively accept responsibility for *'advancing community knowledge that results in unexpected courses of action* (Bereiter and Scardamalia, 2014, p.3). Unexpected courses of action reflect teacher descriptions of 'knowledge creation' in the case study sites. This outcome is very different from designing learning using subject-specific knowledge. As part of the process of working with ideas to create something new, Bereiter and Scardamalia distinguish between 'belief' mode and 'design' mode which reflects the work of teachers in the case study sites. They separate them in this way:

> belief mode comprises activities that are concerned with evaluating, questioning, accepting, or rejecting knowledge claims. Design mode comprises a broad range of activities concerned with knowledge production and improvement: theorizing, invention, design, identifying promising ideas, and searching for a better way—in short, all the kinds of activities that mark a knowledge-creating organisation (Bereiter and Scardamalia, 2014, p.4).

Bereiter et al suggest that the most creative knowledge work is carried out in design mode, where 'the concern is not with ideas as objects of belief but . . . objects of creation, development, assembly into larger wholes, and application' (Scardamalia and Bereiter, 2007, p.14). Their phrase, 'searching for a better way', epitomises teachers' approach to designing learning in the case study sites, which includes working deeply with knowledge in collaborative ways. An early career teacher, talked about,

> *the many different layers to this thing … teaching is there but there's all this other stuff going on, and if you care about the teaching you've got to manage all that stuff too in order to get your ideas heard and get some sway over things. Yeah, you could just focus on your class, but if you care about your learning area then you want to see things done differently* (ECT, CS 2, T445).

Dominating disciplinary standpoints and the invisibility of interdisciplinary expertise is a key issue identified in the data. In the literature, descriptions of 'knowledge building and knowledge creation expertise' make reference to multiple skills and understandings required. The creative knowledge work identified as part of the design phase is familiar to teachers designing learning in the case study sites. It is very much about 'knowledge creation expertise' that is rarely talked about in planning learning contexts (Bereiter and Scardamalia, 1987; 2010a, in Chen and Hong, 2016, pp.267-8). Bereiter and Scardamalia talk about the ability to engage in iterative cycles of information processing and the ability to assess personal beliefs surrounding key ideas presented. They also talk about the skills required to search for new information and create coherence in light of seemingly unrelated knowledge and key concept perspectives. When teachers



collaborate to design learning they need not only to be prepared to engage in ongoing problem-solving but also be able to invest their cognitive capacity in new learning.

> Collaborative designers develop expert knowledge to adapt and revise their knowledge and they develop the capacity to go beyond their specific discipline or technical training and adapt knowledge using adopted skills modelled by other teachers from other disciplines collaborating to design a program of learning (Bereiter and Scardamalia, 1987; 2010).

In turn, such activity helps teachers expand their collaborative expertise (Domain 3) and interdisciplinary knowledge (Domain 1). Exercising these various forms of expertise contributes towards teacher professionalism and student outcomes. The need for teaching to become a knowledge-intensive profession implies a re-consideration of how knowledge is created and applied within education contexts; collaborative design is supporting teachers in the case study sites to embrace a knowledge-intensive role.

Collaborative design therefore is an example of how knowledge can be created in schools. It is an accumulative knowledge practice with a focus on creating something new. The accumulation of knowledge and knowledge sharing is dependent on collaboration and recognition that

> knowledge-sharing requires an effort of thinking and understanding, an ability to call into question one's own certainties, an openness to otherness or to the unknown, a desire to cooperate and a sense of solidarity (UNESCO Report, 2005, p.159).

To achieve these capacities teachers need time, resources and genuine policy commitment to professional collaboration particularly in interdisciplinary and collaborative design planning learning contexts.

On many levels, 'collaborative design' offers a pathway towards a knowledge-intensive profession. In the case study sites interdisciplinarity is the vehicle of choice that is driving a knowledge creation agenda that includes teachers as knowledge creators and schools as knowledge creating organisations. Teachers in interdisciplinary design contexts are immersed in a significant 're-consideration of how knowledge is generated and applied within education', as Chan suggests is an important consideration (Chan, 2011, p.147).. 'Interdisciplinary collaborative design work' is not only an example of how knowledge can be generated, disseminated and applied in education, but such decisions also influence key managerial, structural, operational and staffing decisions so that teachers can work collectively.

Schleicher notes, however, that there is little empirical evidence that learning from each other's accumulated knowledge, as a form of knowledge building, is associated with better performance and more innovation (2012, p.45). Teacher claims in this study suggest otherwise: that collaborative design work positions teachers to learn from each other's accumulative knowledge *and* ensures they develop the capacity to collaborate and innovate and develop new ways of working with and creating curriculum knowledge. This is a fruitful topic for further research about teachers learning from each other's accumulated knowledge.

A key element that could be included in this statement is the provision of a 'basis' for reform that relates specifically to 'teacher work practices' such as the practice of planning or assessment of learning. Evidence about the capacity of teachers to create as a result of engagement in collaborative and accumulative knowledge creation practices is reflected in teacher claims about professionalism as defined by (Bourke et al, 2014) discussed in each of the key case studies. It is also reflected in teacher metaphors and claims teachers make about their collaborative design experiences and dispositions and motivations needed to work in interdisciplinary design contexts that help shift teachers' 'epistemological understandings about knowledge, curriculum, teaching and learning' (Freeth, Andreotti, 2012, p.2). These claims are provided in each of the key case studies. For example, an early career teacher commented

> *Working across the disciplines has caused me to use some of the ways of thinking that I would have used in some contexts in other contexts … the walls between subjects are extremely fluid ….It has helped me learn from a whole range of people's perspectives. Interdisciplinarity is a good fit with my inclination.*

As a result of engaging in accumulative and collaborative knowledge practices to design learning, this teacher has learnt to think and know differently about knowledge and has gained understandings about the *'fluidity of the walls between subjects'* that present multiple possibilities for planning learning. In conversations with other teachers, this teacher was surprised that other schools provided only minimal or no direction for planning learning. He shared his disbelief that early career teachers in other schools were told *'here's your class, there you go, do something'.* What he had to say about 'planning' speaks volumes for what doesn't happen in many schools in regard to organisational and structural support for planning learning. This raises questions about the lack of planning cultures in many schools, including support for 'assessment of learning' compared to 'planning of learning'.



An early career teacher empathised with the lack of a planning culture and support for teachers in other schools and went on to say:

> *When schools use a collaborative planning model, have meetings, discuss what's going on, contribute to ideas and are part of a culture that is very open to ideas, teachers are not totally responsible for the planning of learning and just because you're new there is no reason you can't suggest something and feel like it is being taken very seriously. So, it helped me to learn from a whole range of people's perspectives about how they teach, and so I think that was really quite good for development. The time that's given here for planning is significant, and it means that, whatever else happens, you never get too busy to go and talk to your colleagues about what's happening, and that, I think, is something really.*

This teacher's experiences of being able to contribute to the process of designing learning collaboratively helped them articulate what it means to share knowledge with colleagues and do something worthwhile collectively without all of the responsibility. The door to a collective future has been opened because time to plan together is included routinely. The narrative used in the description above is not the experience of most teachers but could be if leadership paid greater attention to the capacity of teachers to collaborate.

Consistently, early career teachers provided particularly insightful perspectives about teacher practice that challenges the status quo about how and why things are prioritised, organised or structured in certain ways in schools. They were forthcoming in being able to highlight contradictory aspects of teacher work and conditions and of policy expectations that experienced teachers may not readily identify or challenge.

It is also important to acknowledge the role of site leaders and leadership teams in building expertise in the case study sites. For example, a Principal talked about the importance of addressing complexity practice issues and developing *strategies to 'prepare for the unexpected rather than 'plan for the known'.* Of particular significance, from a leadership perspective, as noted earlier, is understanding that once the decision to *'integrate curriculum'* had been made, schools need to *be prepared to problem solve around this decision, without thinking about all the structures that you've got in place that are going to stop it happening.*

**Teacher statements about teacher as 'knowledge builder/creator'**

The headings are adapted from the work of Chen and Hong (2016, pp.266-288).

A focus on collective excellence

> *I think collective ownership of curriculum is incredibly important. I'm very proud that it exists, like people have put the effort in.*

Willingness to embrace 'big picture' knowledge perspectives

> *The characteristics of teachers who work very well in interdisciplinary design environments is the ability to say, that the big idea is what's important. So, if you have an agreement, the big idea determines developments of scientific understanding and drives innovation or application, that's the important bit. If there's some Chemistry or Physics or Biology or History or English or Politics or media that comes out of that, then that's good, and you can include it if it fits.*

Reflective teacher practices including articulation of education values and beliefs

> *Essential Studies (8 compulsory Integrated Programs at one of the case study sites) allow teachers, to actually put into practice their core beliefs, like we don't have the frustration with the artificiality of planning learning linked to the disciplines without context… No, we can actually do this in a really meaningful way.*
>
> *We've done a lot of work this year on the eight Essential Studies (Integrated Programs) asking ourselves if those areas are still important and still relevant?*
>
> *The important thing is to have an overview around everything. There's no expectation to have an equal understanding but there's no point in the English teacher just having their head around English. That's kind of irrelevant, that's like saying, I know how the wheels work, but the rest of the car is not important.*

Iterative cycles of information processing

> *There's a lot of time spent in our meetings asking what each module, groups of teachers are doing to make sure it develops those agreed connections. I guess we're expecting the students to be able to connect the dots, so we as teachers we need to know where those dots are.*
>
> *There's a lot of time needed here because teachers are thinking …. Is it productive? There's a lot of time needed to get your head around it. Everyone needs to be on the same page.*

Teacher investment in their own cognitive capacity for new knowledge and new learning

> *One thing that I don't think we're doing as well as we could, is the area about neuroscience, like in the last five years that's just exploded" but we're not doing anything about it yet.*
> *It's incredibly messy! In biotechnology there was a whole unit on genes and DNA, … The biotechnology team, said, this isn't biotechnology, it's not cutting edge, we're not doing it, so there was negotiation with the Biodiversity team where it fitted beautifully because they were doing evolution. So, they said, here's three weeks of work that we've already organised, let's move it there. It's a much better fit now.*



Efforts to create knowledge and curriculum coherence

> *There's that constant need and ability to challenge yourself as a teacher and consider why are we doing this? We've had teachers who jump in and go, this is awesome, this is what I've always wanted, and some who ask, are you sure we're allowed to do this.*

*There is a lot of work involved in mapping the content and aligning what we have designed with the Australian curriculum standards to ensure we are not disadvantaging kids in any way.*

Engagement in problem solving

> *Teachers enjoy the collegiality and the team planning. We've got a lot of graduates who understand it's not about following the curriculum. What's important is that it is about students.*

**Concluding Comments**

The case study schools are building knowledge and creating something new and relevant for their school communities through the operationalisation of interdisciplinary thinking, collaborative design and structural change for 'the production and continual improvement of ideas of value to a community' (Scardamalia, 2003, p. 269–272). The continual improvement of ideas of value to a community' is what schools are best placed to do yet so often they are distracted from core business. Scardamalia suggests that a focus on continual improvement of ideas, which the production of interdisciplinary curriculum represents, is also about the realisation of education as a knowledge-creating enterprise (Chen and Hong, 2016, p2). The interdisciplinary collaborative design work of the case study sites provides examples of knowledge transforming processes that support teachers to shift from disciplinary to interdisciplinary ways of thinking and designing learning that challenge teachers to think deeply about 'knowledge' not just as a noun 'something that is fixed, universal and cumulative, but more as a verb, something that is performative, fluid, contextual and generative' (Freeth, Andreotti, 2012, p. 5).
To this end they advise school Leaders that have difficulty in engaging teachers in the inevitability of shifting school contexts to support

> educators who have been conditioned by twentieth-century thinking and practices (that) need support to develop literacies and dispositions to engage with shifting contexts to create possibilities beyond what has been imagined so far. This involves deep cognitive, affective, relational and performative professional and personal transformations that *cannot be engineered as a mechanical, predictable and development process*.
> (Freeth and Andreotti, 2012, p.7).

## SECTION 5:

## SUMMARY INTERVIEW SURVEY: DISPOSITIONS, 'MOTIVATIONS' AND 'SCHOOL CULTURE FACTORS

| *Key issues identified* | *Key question arising* |
|---|---|
| Schooling is not organised around teacher work practices and teacher capacity to collaborate | How does the practice of designing learning collaboratively help teachers reclaim professional practices? |

The summary survey completed by all classroom teachers interviewed provides data about teachers' personal dispositions and motivations to collaborate as well as school culture factors that support teachers to create Integrated Programs, collaboratively. Most significantly the survey provides data about teacher intentions to seek collaborative design opportunities with others in the future. From the outset this study asserts that 'collaborative design' is a basis for the development of collaborative expertise, capacity building and the reclaiming of professional practice. To provide evidence about these assertions a summary diagram of teacher dispositions, motivations and school culture characteristics is included (Appendix #4, p.293).

As discussed earlier, in the Australian context it is generally agreed that interdisciplinary planning teaching and learning in senior secondary contexts is minimal (Groundwater-Smith et al, 2009). School priorities identified across the case study sites – '*student well-being'*, *'student engagement'* and '*making time for interdisciplinary thinking'* – have all embraced opportunities to plan learning from and Interdisciplinary perspective using an Integrated Program approach and collaborative design practices to address the priorities identified.

To understand how the case study schools have persisted and sustained integrated curriculum design approaches in senior secondary contexts for periods of up to fifteen years, it is also important to reflect on the *'personal dispositions'*, *'motivations'* of teaching staff and *'school culture'* factors that have supported teachers to persevere.

The post interview survey asks teachers to consider *'personal dispositions'*, teacher *'motivations'* and *'school culture'* factors in relation to 'teacher designer identities', 'capacity to collaborate' and work with interdisciplinary knowledge to design learning. Teachers were also invited to imagine the possibility of engaging in future 'collaborative design' opportunities in other senior secondary schools.



**The post-interview survey**

The post-interview survey (See Appendix #4) includes responses from 15 practising teachers from the case study schools about *dispositions', 'motivations' and 'school culture' factors* that have supported their 'collaborative design' efforts. Many of the statements used in in the post interview survey (below) are based on findings from the CREANOVA Project, a study about environments that foster creativity (Davis, 2013, p2). The CREANOVA survey was an online statistical questionnaire of 1200 people (570 respondents) in creative organisations in four countries. The statements used in this study's' survey are adapted from Davis's discussion of the CREANOVA project (2013) and claims that Davis makes about the findings that benefit education. These include the value of diversity, equity, promotion of dialogue and fostering what Davis describes as flexibility/complexity (2013, p.15) that enables 'possibilities thinking' and helps this study to describe the increasing focus on interdisciplinary and collaborative workspaces.

Davis demonstrates a quantitative basis for the argument that *'flexibility stimulates creativity and flourishes in environments that value autonomy; supportive structures and collaborative relationships'.* Similarly, teachers working in a well-being culture in this study place value on all of those factors (see Case Study 4, Chapter 6). Site leaders identified the importance of *'teacher autonomy'* by adopting a *'yes'* response to *"teacher identified issues as well as curriculum ideas to address those issues collectively"* and *"respect for teacher knowledge and gut feelings for what may work"* (Principal, T427).

An early career teacher also described some of the supportive thinking and actions of leadership and stated *'one thing that is pretty awesome about this place is if we want to do something we can, and it doesn't matter if we want to create a new program or test out a subject, or figure out different ways of doing things'* (FGD, ECT, T717). The value placed on *'teacher autonomy'* and *'collaborative relationships'* to design learning in the case study schools also appear to foster the 'complexity / flexibility' nature of C21st workplaces as described by Davis (2013, p.15).

Davis used the findings of the CREANOVA project to demonstrate connections between integrated and multi-professional ways of working. This study similarly finds teachers making connections across the disciplines. Davis concludes that in schools 'creativity will flourish as long as we adopt flexible approaches to learning [and planning] that are adaptable to everyday occurrences, cultural diversity and aspirations of learners'. Davis suggests that the findings 'can give support to people involved in schooling who have

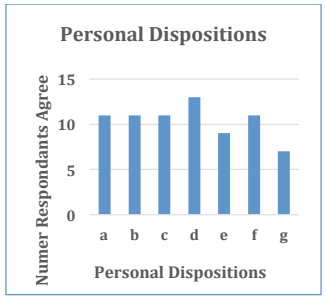
always resisted ridged, performance, test-based and hierarchical approaches to education' (2013, p.15).

Interestingly Davis notes that the literature review for his study about 'creativity, inclusion and collaborative multi-professional learning' had not identified 'stick-ability' (the individual and collective determination to get the job done) nor 'collaborative design' described by one of Davis's respondents, as "the glue that brings creativity and innovation together and ensures that an idea leads to an outcome" (2013, p.15). The fact that 'collaborative design' is recognised as having links to creativity supports creativity arguments related to the role of teacher as creator, in this study.

Figures below indicate teacher perceptions about the importance of key dispositions, motivations and cultural factors to engage in interdisciplinary, collaborative design work, (adapted from Davis, 2013, CREANOVA Project).

Teachers were asked to identify key dispositions required in a collaborative design context. See FIGURE 4:

**FIGURE 4:** PERSONAL DISPOSITIONS IN A COLLABORATIVE DESIGN CONTEXT




a) Ability to embrace doing something different, collaboratively
b) Appreciation of diversity, tolerance and respectful and trusting working relationships
c) Emotional skills to work collaboratively – inter-relationship sensitivity, generosity, compassion, recognition of strengths
d) Dispositions to engage in risk taking, ambiguity, engage freely in dialogue; pose questions freely and work in a more playful environment
e) Ability to learn from different cultural perspectives
f) Ability to imagine the possibilities and to hear and experience the imaginations of others
g) To connect the task and the thinking to your own interests and knowledge and possibilities.

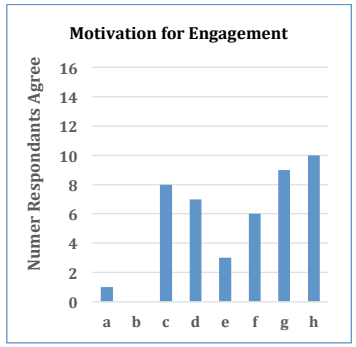
Teachers agree they need 'to be able to engage in risk taking, cope with ambiguity, engage freely in dialogue, pose questions freely and work in a more playful environments in collaborative design contexts as suggested by Davis et al (see Figure 4). The responses affirm the complexities of collaborative design. Davis also emphasises 'creative outcomes that can emerge through collective processes and interactions within



systems' (i.e. through collective dialogue that facilitates individuals and groups to come up with new ideas or knowledge' (2012, p181).

Similarly, Donohoo reminds us about 'paying attention to the details and undercurrents in a school including anything preventing a team of teachers from feeling supported' (2016, n. p). The case study schools are making efforts to attend to such details including the potential of 'learner-led' spaces where students and teachers can situate learning in their own life contexts' (Davis et al, 2013, p.16). Teacher motivations for engagement in collaborative design work are shown in Figure 5 below.

**FIGURE 5:** KEY MOTIVATIONS TO ENGAGE IN COLLABORATIVE DESIGN PRACTICES



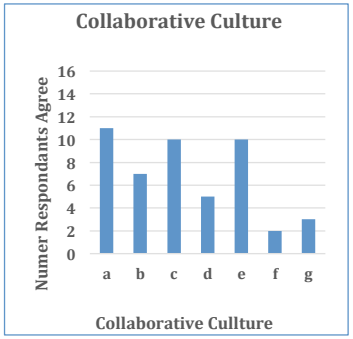

a) Economics of Integration: outcomes/issues. (Timetabling)
b) As a response to curriculum reform ie 'new' SACE
c) Opportunity to engage in C21st conceptualisations of curriculum to create programs specific to students' needs.
d) A chance to work in multidisciplinary teams
e) Collaborative design practices that aligns with teacher philosophy of education
f) Engagement in innovative curriculum work that respects role of teacher as 'knowledge creator'/ designer
g) A way to broaden knowledge and create curriculum to address challenging contexts
h) A belief that Integrated Programs help students achieve SACE and develop knowledge, capabilities for 21st century.

Teachers chose 'motivations' that link strongly to teacher practice and student outcomes including a way to broaden and create curriculum and the fact that Integrated Program approaches help students be successful in the SACE. In a 'group discussion' teachers talked enthusiastically about increasing numbers of students successfully completing schooling as a result of participation in Integrated Program packages. For example in one of the key case study sites in 2015, 95% of students participating in SACE integrated packages successfully completed the SACE (FGD, S2,T970 ). Unfortunately, this data is not available systemically. Thus true official SACE outcomes of the Integrated Program option, is not possible at this time.

Figure 6 below relates to school culture factors that enable collaborative design practices. Teachers selected 'a belief that Integrated Programs help students achieve SACE', while collaborative design was identified as 'a way for teachers to broaden knowledge and create curriculum

The post interview survey (Figure 6, below) asks teachers to consider a range of school culture factors that enabled collaborative design practices (See Appendix #4). This included a leadership team that values teacher collaboration, a school culture that promotes 'collective excellence' and a school culture that enables teachers to put into practice, their ideas, learning and knowledge.

**FIGURE 6**: SCHOOL CULTURE FACTORS ENABLE COLLABORATIVE DESIGN

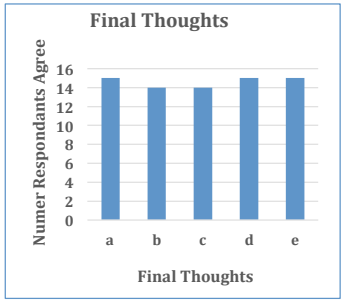



a) School leadership that values teacher collaboration and collaborative innovative practice.
b) A focus on 'Capacity Building': *Any strategy that increases collective group effectiveness (Levin & Fullan in* Gilbert, 2011)
c) School cultures that nurture 'collective excellence', collaborative expertise (Hattie, 2015) & teacher autonomy.
d) Organisational & structural factors that enable collaborative design (ie time and space to collaborate)
e) A culture that enables teachers to put into practice their ideas, learning and knowledge.
f) Forums that stimulate collective reflexivity for teachers to analyse their perspectives on the same 'big issue'.
g) Commitment to solving teacher work related issues.

Figure 7 below culminates in teacher responses to the final question about teacher intent to seek ongoing 'collaborative design' opportunities, particularly if they move to other schools.



**FIGURE 7**: INTENT TO SEEK FUTURE COLLABORATIVE DESIGN OPPORTUNITIES




a) Was the practice a 'learning experience that generated interest, excitement, relevance?
b) Was the experience transformative? Has it enabled you to think differently / teach differently?
c) Has the experience challenged how you think about teacher identity / work roles?
d) Has the experience helped redefine the process of designing learning as a more collaborative practice?
e) In the future will you seek out collaborative design opportunities including designing Integrated Programs?

## Concluding Comments

Teachers were asked about 'moving to different schools in the future and their intention to seek opportunities to collaborate to design learning across the disciplines'. All teachers interviewed expressed their resolve to seek future collaborative design opportunities. This suggests that all teachers interviewed found collaborative design experiences 'meaningful', professionally and personally. It also suggests that planning processes that foster interconnectedness help shape innovative and relevant curriculum decision- making (Andreotti and Pashby, 2013, pp.7-8). The following statement describes shifts in conceptualisations of knowledge and learning as a result of teacher engagement in collaborative design practices. An early careers teacher commented

> *We are encouraged … to think this is Physics, this is Chemistry, ,,, this is English. They're very narrowing points of view really. I don't think it's obvious unless you really, really think about it deeply. I started thinking about it deeply when I was presented with this idea of the integrated curriculum, and then I started to really have to think about the disciplines and what they're about. I've been dwelling on these ideas* (EYT9, T838).

Andreotti et al (2013) advocate for professional learning opportunities that shift teacher conceptualisations about knowledge, teaching and learning including understanding 'curriculum as a contested text, a negotiated social practice, rather than as prescriptions and requirements for development and implementation' (2013, p.7). The collaborative design process provides 'safe spaces' for teachers to context curriculum and gain a sense of 'intellectual autonomy' where they can make decisions safely and 'critically analyse the origins and implications of organising knowledge in new ways' to engage with key concepts related to key questions of interest to a group of students. The design

process provides space for *'individual learners to take ownership of their learning'* (collectively). Andreotti and Pashby state that when learning is designed with others, 'identities are constantly renegotiated, including understandings about knowledge and learning …. Ideas of knowledge and learning are intertwined with identities, roles and relationships within and beyond professional spaces' *(*Andreotti and Pashby, 2013, p.8).

In relation to post interview survey data teacher choices of dispositions, motivations and school culture factors suggest strong links to teacher practice issues.

Personal disposition choices considered most relevant were about teacher capacity to engage in risk taking, cope with ambiguity, engage freely in dialogue; pose questions freely and work in a more playful environment. Teacher motivations to engage in collaborative design work included opportunities to broaden knowledge and create curriculum to address challenging contexts to help students develop knowledge and capabilities.

Aspects of school cultures considered necessary to support collaborative design practices included school leadership teams that value teacher collaboration and cultures that nurture collective excellence and collaborative expertise. Teachers' final thoughts about 'collaborative design' suggest a shift in beliefs and understandings. Andreotti et al. describe as the importance of growing the

> intellectual independence and professional autonomy of teachers as curriculum decision makers and the importance of emphasising the professional strength of teachers as public intellectuals, well equipped to negotiate the tensions, complexities and conflicting political and institutional demands of teaching in increasingly diverse and unequal societies (2013, p.8).

Most significantly, the fifteen practising teachers interviewed for this study all indicated their intent to continue to seek out future collaborative integrated design opportunities.as part of the summary interview survey. A comment by an early career teacher pointed to the importance of:

> *being more collective as a profession and having this collective idea that we (all teachers) are jointly responsible for improving the profession and improving what's happening in the schools* (ECT3, 752).



## SECTION 6:

## AN INTERDISCIPLINARY 'PLANNING LEARNING' PROCESS

| *Key issues identified* | *Key questions arising* |
|---|---|
| Minimal recognition of collaborative expertise, collective excellence, collective efficacy (Eels, 2011, Hattie, 2015) in schooling. | How do teachers collaborate to design interdisciplinary programs?<br>How do people collaborate for knowledge creation (Chan, 2011) |

A key issue identified in this study is the invisibility of teacher 'collaborative expertise' and the concomitant lack of designated time for teachers to collaborate. Being able to collaborate professionally is rarely part of teacher timetables but is understood as something teachers just do. This attitude needs to be challenged because collaboration is increasingly part of education policy decisions without consideration of the implications for teacher practice. This document provides a description of an interdisciplinary design process, which includes the organisation, and the processes involved in designing an Integrated Program. The description provides insights about how teachers collaborate and how a school has developed practical ways to build capacity in teachers' collective expertise.

'Collaborative design' is recognised as a basis for the development of collaborative expertise, best described by a teacher leader practitioner responsible for the development and maintenance of Integrated Programs of learning with a team of teachers at one of the participating sites in this study. The following discussion is a comprehensive example of the organisation of a school community where interdisciplinarity shapes the culture of the school. Other case study sites have taken steps and have changed aspects of how their schools are organised and structured to make collaborative design happen, but not to the same extent as this exemplar.

Analysis includes reference to the OECD Teacher Professionalism index (see Chapter 2, Figure 2, p43), which helps identify this site's focus on building teacher capacity (professionalism). It is important to reiterate that this study recognises teachers who are working collaboratively (Domain 3) with diverse knowledge in interdisciplinary senior years planning contexts (Domain 1) to design 'Integrated Programs' of learning introduced as part of a senior secondary certificate of Education in South Australian schools 2008-2012. The study has proposed that teachers working with diverse

knowledge are positioned to contest curriculum knowledge on a daily, weekly and yearly basis (Domain 1), and are in a position to develop significant autonomy (individual and collective) (Domain 2) to make curriculum decisions. The organisational and structural support in the case study sites for interdisciplinary thinking and planning is varied and is largely determined by the priority given to interdisciplinarity and teacher professionalism so teachers can collaborate and network professionally (Domain 3).

By identifying the various elements of the 'Domains of Teacher Professionalism' in the detailed description of a collaborative design practice, evidence is revealed about *the practice of designing learning collectively.* Descriptions of the process of designing learning also provide insights about *'how this practice advances teacher professionalism'* (teacher knowledge, teacher autonomy and teacher capacity to collaborate) (OECD, 2014a). Analysis of the description of the collaborative design process provides evidence about the development of 'collaborative expertise' in an interdisciplinary design context as well as insights about *'how schools can develop the capacity of teachers* (to collaborate).

The descriptions of learning design processes include philosophical, organisational and structural considerations articulated by a Curriculum Manager at one of the key case study sites. The Integrated Programs created have maintained their relevance because the school has a focus on teacher practice that includes ongoing maintenance and renewal objectives of the numerous programs created. This certainty and nurturing of collective ownership attitudes promotes respect and the sustainability of teacher work.

The following example of an interdisciplinary planning process describes a team process, that includes the Curriculum Manager and up to twelve other teachers who are jointly responsible for the review, maintenance and development of some of eight continually evolving 'Integrated Programs' at this site (Domain 2). These programs of learning are positioned at the core of curriculum offerings for year ten and eleven students at this site. They have evolved over a fifteen-year period and their strength is that they continue to evolve because teams of teachers have the responsibility and autonomy to ensure their continuing relevance and rigour. Teams of teachers at this school reflect on each of these core programs regularly (including formal meetings each week) and engage in dialogue about issues arising and possibilities for the inclusion of new knowledge or pedagogical resolutions for the teaching and learning of a particular concept, new knowledge or a renewed module of learning (Domain 3).



The Curriculum Manager stated, that planning needed to include a question about *whether or not areas of learning integrated are still important and relevant'* (Domain 2). The thinking and organisational requirements driving interdisciplinary planning in a senior secondary schooling context is reflected in the following descriptions about how a team of teachers create and maintain an interdisciplinary program of learning.

The discussion is guided by four key questions about the relevance of collaborative planning to design an Integrated Program, organisational and structural considerations and what makes a good program and teacher of an Integrated Program?

***Why are interdisciplinary collaborative planning approaches relevant in this context?***

> *There are very few problems in the real world that are, for example, only a chemistry problem or an engineering problem. If it is a big problem, then it is rarely discipline based – that's the reality of learning. The disciplines are an artificial way of looking and thinking about the world …… If you're looking at questions like climate change for example, it is not a discipline question. There are many different ways of thinking about this issue. In reality the disciplines have to work together and that's what we are doing here. The disciplines actually have to work together (Domain 1).*

> *Given a chance, teachers are quite happy being a teacher of a particular discipline, it's easier, but they also enjoy the collegiality and team planning (Domain 3). There's a whole heap of teachers here who are in their first, second, third year of teaching and they are open to opportunities to design learning other than using a disciplinary approach. They are asking questions about how important disciplinary knowledge really is! We've got a lot of graduates who have had the opportunity to think about their role and are confident about coming up with something cutting edge and relevant. It's not about following a curriculum; what's important is about students doing learning that is worthwhile and relevant. The context for interdisciplinarity …. that's what is important! Why do we care about clean water? How do sustainable houses work? What's the science behind it? Why do we need to do it? What are governments doing? It's not science as scientists do, science is a way to answer questions, and we answer questions because we all have needs and those everyday needs are important (Domain2).*

***What processes are used to design an Integrated Program?***

> *Big ideas are the starting point and engaging in complex reflective processes or contemplating a broad range of ideas or being mindful of concerns likely to be raised by colleagues and students (Domain1). As a team of up to twelve teachers representing different areas of knowledge we need consensus about the 'big ideas' and their continuing relevance. It includes spending time asking questions about areas of potential interest that are 'cutting edge' relevant…and to start with those twelve people from four or more different discipline sit around spending time asking questions, clarifying understandings about key ideas and making links to various areas of learning, that are relevant (Domain 3). It's incredibly messy because we are making decisions based on the discourses and subsequent thinking*

*triggered by those discourses of a particular group of teachers at a particular point in time (Domain 2).*

*We also spend some time looking at the Australian Curriculum and everyone has a similar headset about the knowledge identified as important, that, not surprisingly, is in the Australian Curriculum. So, we sort of tick the boxes. We need to look back then about what the big ideas were and spend time and reach agreement on what the big ideas should be (Domain1).*

*With each essential study there's also a fertile question so we need to make sure that this still works too. Some of the changes are quite small such as recently, for 'The Body in Question' Essential Learning, we changed, how can we influence human health? to how human health has been influenced? It doesn't sound like a massive change, but It was all about students as individuals influencing their families or friends' health but with the introduction of an increased History focus, because of the year 10 Australian Curriculum History, we needed to consider events that influenced human health in the past and what happened when your parents were young? and what happens now and what's going to happen in the future? So, we've had to change that big idea and that needs to happen across the all of the disciplines being integrated (Domain 2).*

*There's a lot of time needed in the initial stages to get your head around it all and everyone needs to be on the same page. Once the big group has decided on the key organisational elements of the program they document their thinking using an understanding by design (UBD) Framework. We reintroduce those decisions each year to the group responsible for that program (Domain 2). So, for each group we say here's the essential questions, here's the understandings, here's the knowledge, here's the skills. Five or six years ago we had to generate those big ideas from scratch, but now we're like, here's what we did last time, do we need to change anything? No, beautiful, let's move on…. (Domains 1, 2, 3).*

At this particular site eight central Essential Studies (Integrated Programs) have been created as a result of a unique combination and collaboration of teachers, ideas and knowledge and a hundred minutes a week set-aside for teams of three teachers to design program modules for the same Essential Study of an Integrated Program). All three teachers are responsible for teaching team modules in different semesters in the same year. In larger teams too (10-12 teachers) share progress, new learning and seek feedback. The ongoing documentation of progress using site created design frameworks continues to build an evolving and changing knowledge culture for generations of teachers to the school.

The curriculum leader talked about smaller teams in the past needing direction but in more recent times, he observed teams working more autonomously.

***What organisational and structural planning considerations have been implemented to progress interdisciplinary thinking, planning and learning?***

*Generally, teachers meet for half an hour of administration information and then meet for about an hour each week to work on each teams' particular module. These ten or so people*



*make decisions about key ideas, fertile questions and pedagogical resolutions that could potentially evolve into a program of learning that is 'cutting edge' and sustainable (Domains 1, 2, 3). It is always a unique mix of personalities with unique group dynamics, so from a curriculum leadership perspective and an organisational perspective, balancing this is complicated.*

*The initial group of 10-12 teachers becomes two or three groups of three or four teachers who collaborate to design and teach an identified program module where the key curriculum decisions have been carefully mapped as part of synthesising and reconceptualising disciplinary content (Domains 1, 2, 3). The smaller groups of teachers then have the responsibility for designing 21 lessons to be taught over 8 weeks and each teacher takes responsibility for the 1st, 2nd or 3rd set of seven sequenced lessons which offers huge advantages in terms of workload and motivation to create something worthwhile (collectively). Teacher interest and subject knowledge guides the makeup of the design teams, but it is not essential (Domain1).*

*The tricky thing is that some teachers have taught the units before and some teachers haven't. So, the first session is essentially, this is what we did last time, and that's a 10-minute overview, here's the topic, here's the key events, here's the modules. Now here's half an hour, have a look yourself, sit with someone and just go through it yourself, because some of those discussions you can't do unless you've made the connections between what has existed before and what thinking (new knowledge, new learning, key ideas, fertile questions) are triggered as a result of being part of a newly structured team (Domains 1, 2, 3).*

*We assume that everyone's got at least a taste of the unit, got their heads around it but the important thing is to have the heads around everything. There's no point in the English teacher saying, I've got my head around the English. That's kind of irrelevant, that's like you're saying, I know how the wheels work, but the rest of the car is not important. There's no expectation to have an equal understanding but at least teachers need to understand that the English task links to that Science task that links to the key ideas (Domains 1, 2).*

*Making that shift from disciplinary to interdisciplinary thinking is an ongoing challenge. There are staff who haven't been able to adapt, and have left, because it's too hard. Everyone appreciates the balance that needs to be achieved between interdisciplinary perspectives and disciplinary perspectives and the role of teachers in making this happen. Certainly, in the early stages it does take a long time to appreciate. There are conversations…. let's agree on this is a big idea and we're happy we know what that means. but there's a lot of conversations about developing that time. There's a lot of time spent in our meetings asking what other teams are doing and the connections being developed. I guess we're expecting the students to be able to connect the dots, so we as teachers need to know where those dots are (Domains 1, 2, 3).*

*Striking that balance between individual perspectives and collaborative design perspectives is a key issue. Teachers may have designed seven brilliant lessons, but it's not how the next teacher would do it. So how do we strike that balance between every teacher having a different relationship with knowledge and every teacher having different skills and beliefs. So, when teachers design their seven lessons we want the lesson plans too because it's going to be shared with other people, and maybe in two years or in six years, people are still going to be using, Anne's version or Andy's version, the same PowerPoint and handout and practical. There are different ways of doing it and they don't have to do it the same, but at the end of the day we need to be assured that students have the same skills, understanding knowledge*

*developed as a result of rich dialogue and rich tasks, so, from a disciplinary assessment perspective, they won't be disadvantaged in any way (Domains 1, 3).*

***Future directions and what makes a good teacher of Integrated Programs?***

*What we need to do over the next couple of years is re-address what the big questions are. That's one of the first things. There's nothing stopping the SACE Board (South Australian Certificate of Education Board) going, there's a new Year 12 subject called Robotics. The argument we had was if a student comes into 1st year Medicine and is prepared with the big ideas that are needed in 1st year Medicine, surely that's better than an understanding of eco systems and stuff in Chemistry where maybe 20% of the course is relevant (Domain 1). The other issue is related to not being able to continue into year twelve with interdisciplinary planning and teaching. It's frustrating, to do all of this work and then when students get to year twelve we're not allowed to continue this approach. Students therefore and teachers too are at liberty to say well, why are we doing it in the first place?*

*Teachers need to be able to put their discipline knowledge to one side. Teachers here are not a Physics/Chemistry/Biology/English teacher, they are a teacher in a unit called 'Body in Question', so the big ideas of the unit, 'The Body in Question' is the important bit, which means if you spend 8 weeks of 12, not really addressing your area of interest then maybe hopefully we'll do a better job next time with staffing (Domain 2).*

*The artificiality of planning learning linked to the disciplines without context…is an increasingly uncomfortable space for teachers particularly for teachers interested in interdisciplinary planning approaches. What we plan in interdisciplinary design contexts can be achieved in a really meaningful way and to have it come off is exciting, particularly when you're taking risks. Interdisciplinary thinking and planning allows teachers to actually put into practice their core beliefs. We've got teachers who come from a very disciplined background, who love the discipline and who have slowly changed over time. There are also teachers who enjoy working here because they can practice what they believe and teachers too who are being pushed outside their comfort zone. We've had teachers who just jump in and go, this is awesome, this is what I've always wanted, and some who ask… are you sure we're allowed to do this? Most significantly, here, we keep asking why we are doing this?..... It's so students can understand the importance of it. So why do it if it is not important… not relevant? Here we can constantly challenge ourselves as a teacher ……*

**Concluding Comments**

The curriculum leader talked with newly found awareness about the significance of teachers being able to practice core beliefs and credits interdisciplinary thinking and planning practices as a vehicle for the realisation of core beliefs about teaching and learning. 'Knowing' as 'knowledge about knowledge, or awareness of the processes of learning and knowing rather than just knowing the content of what is known' (Yunkaporta, 2009 p.11) highlights the significance of teachers' key role in curriculum creation and the fact that 'knowing' about 'knowing' in education contexts is best achieved collectively. 'Sayings', 'relatings' and 'doings' (Kemmis, 2009a) discussed by the teacher leader describe changes to teacher 'practice architectures' as a result



of engagement in collaborative design work. Teacher claims about changes in practice are discussed in each of the key case studies.

The team leader's descriptions about collaborative design describe how a design process can transform teacher thinking and practice from disciplinary to interdisciplinary and from individual design practices to more collaborative ones. He talks about teachers constantly challenging themselves in collaboration with others, to maintain relevance. At the core of the practices identified are the domains of professionalism, particularly, the capacity of teachers to collaborate. Without such a focus, none of what is discussed here would be achieved.

It is also not a coincidence that STEM reform initiatives, nationally and internationally have chosen 'professional collaboration' strategies such as *'interdisciplinary thinking, 'integrative synthesis'* and structural change as drivers of reform. These strategies are essentially about teacher capacity to collaborate, but instead of highlighting the process of integrative synthesis this study has come to the conclusion that it would be more effective to emphasise elements of professional collaboration as it relates to teacher work and the domains of teacher professionalism.

The Australian Charter for Professional Learning of Teachers and School Leaders provides specific reference to professional learning that is 'collaborative' and 'futures focused' and recognises that being collaborative:

> has a powerful effect in magnifying and spreading the benefits of professional learning and adds a new and valuable dimension to the learning undertaken by individuals. It connects teachers and leaders to their colleagues within and across schools and to external experts. Effective collaboration involves more than simply working together. It demands a disciplined and purposeful approach to collaborating to solve the challenges that are most important to improving student outcomes.

The Charter suggests that schools need to look for professional learning that

> promotes teacher and leader ownership of their learning through active involvement in the design, content, practice and evaluation of their learning; provides opportunities to receive feedback on practice and observe the practice of others; offers support to change practice through coaching, mentoring and reflection; provides opportunities to access and learn from experts; develops professional learning communities within and between schools and uses technology to enrich collaboration and learning (AITSL, 2012, p.7).

The charter doesn't need to look any further than 'collaborative design' practice as a means of achieving the various elements of the Charters' recommendations.

Both the 'Australian Charter for the Professional Learning of Teachers and School Leaders' (AITSL, 2012) and the OECD 2015 Education Policy Outlook 'Making Reforms Happen' cite effective policies that include building teachers' capacity (OECD, 2015, p.4). The Charter also identifies characteristics of high quality professional learning cultures evident in the case study data presented in this chapter such as a

> high degree of leadership support for ongoing teacher learning and risk taking; collective responsibility for improving practice; disciplined collaboration goals that relate to the learning needs of student and support for professional learning through school structures, explicit planning and the allocation of time. A focus too on professional learning that is most likely to be effective in improving professional practice and student outcomes (AITSL, 2012, p.5).

'Collaborative design' offers a base; a foundation for education reform; as well as professional learning and the reclaiming of key professional practices such as designing learning and 'collaborative expertise' (Hattie, 2015). It is therefore difficult to ignore in 'teacher practice', reform contexts.



# SECTION 7:

## ABORIGINAL VALUES & KNOWLEDGE CREATION PRACTICES IN MAINSTREAM PLANNING

**Note**: Section 7. This section would not have been possible without Aboriginal women sharing their knowledge and understandings. Specifically, the Manager of Aboriginal Women's Leadership Programs in South Australia and Aboriginal women Education leaders and former colleagues.

Data analysed relates to Aboriginal values and knowledge creation practices that could be applied in mainstream planning. In the absence of collaborative planning frameworks and Aboriginal standpoints, Aboriginal ways of knowing and associated narratives about being, knowing and doing (Martin et al 2003) offers insightful ways to help teachers think about, explain and engage in collaborative integrated curriculum work. The narratives gifted by Aboriginal women workshop participants help answer the question about *what a learning design framework that encourages teachers to plan learning collaboratively, could look like?* Narratives gifted also challenge existing teacher 'practice architectures' (Kemmis 2009a) that impact teacher capacity to collaborate.

| *Key issue identified* | *Key question arising* |
|---|---|
| The absence of collaborative planning standpoints and narratives in curriculum planning contexts | What does a Collaborative Design framework that includes Aboriginal perspectives, look like? |

This section includes the voices of Aboriginal women education leaders and Aboriginal women who attended reclaiming values and knowledge creation workshops and shared their knowledge and values perspectives of significance to themselves and their communities. Designing learning and working with interdisciplinary design considerations demands access to a range of perspectives and narratives that inspire and describe the complexity of collaborative design work. Aboriginal value systems and knowledge systems were identified to help articulate and describe the complexity of collaborative design work in the case study sites. The analysis therefore reflects upon interdisciplinary work practices in the case study

sites that are suggestive and mirror Aboriginal value systems and Aboriginal knowledge creation practices.

**Engaging Aboriginal voices**

To engage in discourses and hear narratives that articulate 'other' collaborative standpoints, Aboriginal education leaders were asked to articulate their understandings about values and knowledge creation practice definitions, available in the public domain. Listening to Aboriginal women give meaning to values and knowledge creation practices such as 'respect' or 'reciprocity' or engaging in discourses about knowledge creation practices such as 'deep narrative' or 'circular logic' raises our awareness about the continuing centrality of such understandings, culturally. Alignment therefore of Aboriginal women's understandings and narratives, with the actions of teachers collaborating to plan learning was a comfortable segue to help describe collaborative practices in the case study sites.

The Manager of the Aboriginal Women's workshops is referred to in this document as Aboriginal Leader three (AL3). The workshops themselves provided reflective spaces for groups of Aboriginal women, as part of their own leadership journeys, to revisit values and knowledge creation practices identified as collectively significant by Aboriginal people'. The first workshop involved participants in 'yarning' about Aboriginal key values and their meaning and relevance now and into the future. Values articulated included core Aboriginal values as outlined in the 'Values and Ethics Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research' that includes reciprocity, respect, equality, responsibility, survival and protection, spirit and integrity. The second workshop focus was about engaging in discourses related to Aboriginal knowledge creation practices including 'Holistic', 'Deep Narrative', 'Communal knowledge', 'Elder Knowingness', 'Intellectual Biomimicry', 'Circular Logic', 'Synergistic Knowledge', 'Indigenous Pluralism' (Yunkaporta, 2007, n. p).

The intent was that through 'yarning', sharing values and collectively promoting Aboriginal values and knowledge creation practices in mainstream planning contexts, the study may be able to shape a more 'collaborative' narrative for talking, writing and practising collaborative design. Nakashima, Prott and Bridgewater, however, warn

> the growing recognition of traditional knowledge might seem beneficial, (but) it poses some major problems. It dissects and reduces such knowledge into the categories of "useful" and "useless",



> fragmenting traditional systems and leading to their accelerated replacement by science. It has also triggered an intensification of "biopiracy", the unauthorised appropriation of traditional knowledge, and subsequently calls for appropriate systems of protection for this knowledge (2000, p.12).

The Aboriginal Women's Workshop Manager (AEL3) provided both a lens and a filter for consideration of the potential application of Aboriginal knowledge in mainstream planning contexts including in interdisciplinary, collaborative design contexts.

> *It doesn't matter if they're taking it mentally or they're actually putting it on paper – they're taking that information away; they dilute it and break it down to what fits their audience. 'You mob are dangerous, the information that is being shared around is dangerous. It's like poisoning a waterhole. You can go to the waterhole and you can take drinking water out, you can wash in that, but you can't then take a cup of water out of that, take it away, and then add food colouring'* (AEL3, T174).

The rationale for sourcing Aboriginal knowledge has not been to take the water away and change the water but to highlight the strengths of the water and align the strengths of Aboriginal values and knowledge creation practices, where applicable, with teacher practice, particularly with interdisciplinary design practice in mainstream schooling.

**Towards recognition of Aboriginal standpoints in education**

The aim of the learning design frameworks envisioned as an outcome of knowledge gifted is about the creation of 'teaching tools to support continuity and integrity of knowledge for past, present and future generations and it is also part of researcher responsibility, to reciprocate where possible. School efforts to adapt, renew and maintain integrated programs is an example of actions that exemplify 'continuity' and 'integrity' of knowledge in our schools.

In discussions about teachers working together to integrate subjects to create Interdisciplinary programs, AEL3 stated

> *I love that this* (interdisciplinary thinking and planning) *is happening; it's like a process that teachers are getting into. They're not using knowledge for power* (AEL3, T249). *Knowledge has a social obligation, it's there in ceremonial stuff and essentially it is a teaching tool for the next generation* (AL3, T38).

Likewise collaborative design is a planning process; a tool for the next generation of teachers.

This study could be considered part of broader efforts to recognise Aboriginal planning standpoints in education. Battiste and Henderson suggest 'a vital part of any process of decolonisation (is) to reclaim and revitalize Indigenous heritage (and knowledge) and interrogate eurocentric concepts of civilization and knowledge' (2000, pp.13-14). As such, the interdisciplinary work of teachers in the case study sites and the women's workshops reflect efforts to reclaim Aboriginal knowledge and raise questions pertaining to eurocentric values and knowledge in schooling.

The application of Aboriginal epistemologies and ontologies and Aboriginal planning perspectives in twenty first century schooling is an important consideration given that 'survival for Aboriginal people, (and for us all) is more than a question of physical existence; it is an issue of preserving knowledge systems in the face of cognitive imperialism' (Battiste and Henderson, 2000: 12).

An Aboriginal teacher leader working in the university sector and a corporate champion of Aboriginal secondary education (AEL2) stated that leadership was a key determinant of collaborative practices and pluralistic planning perspectives. She advised

> *those who are not able to understand that 'power increases when it is shared' also have difficulty in recognising the benefits of 'shared power that leads to the development of future leaders', or shared power that leads to enthusiasm for teaching or shared power actions that support collaboration'* (AEL2, T331).

This Aboriginal Leader further warned that if *'shared power' advocates are not given a voice, collaborative actions are more easily ignored and 'shared power' leaders lose momentum and move on'* (AEL2, T347).

**Key Aboriginal values, knowledge and knowledge creation emerging from the data**

Aboriginal values shared by the three Aboriginal leaders and Aboriginal women in the workshops were aligned with values outlined in the 'Guidelines' for Ethical Conduct Aboriginal Health and Research (NHMRC), (2018, p. 3-12). For example, Reciprocity' is identified as a key value and the practice of being reciprocal is evident in how Aboriginal people live their lives, past, present and future. One of the leaders stated *'it's good that research has unveiled the lack of reciprocity and limited acknowledgement of expertise and knowledge of people (including Aboriginal people) in our system'* (AL2, T162).



Reciprocal mutual obligation working arrangements between the state and schools and schools and the state is required to recognise highly innovative local curriculum resolutions. Reciprocal arrangements support teachers to engage in creative innovative planning and teaching at the local level. Innovation in our schools however is generally left to chance rather than seeking connected, collaborative and reciprocal arrangements that offer possibilities for systemic innovation emergence. In respect to 'leadership' issues and innovation, the Aboriginal leaders were generally suspicious of leadership that was not reciprocal. They questioned charismatic leadership appointments because they believed such appointments were often less reciprocal and more likely to represent Aboriginal points of view without community consultation (AL1, 451).

Respect was a 'value' frequently referred to by the Aboriginal leaders.

> *There has to be a strong commitment from [education] leadership to engage Aboriginal people in ways that respect them [their values and knowledge] where Aboriginal people can come in and have a healthy disregard for authority (AEL1, 538).*

Leaders also talked about 'yarning circles' where *'leadership is shared'* and where people assume equal status. Yarning circles reflect the practices of the largely autonomous design teams, particularly in two of the case study sites. The Aboriginal leaders agreed *'Aboriginal knowledge is constantly pushed aside to make way for the convenience of finishing something or getting a plan completed'* (AL3). There was also consensus that the set of values and knowledge creation definitions presented 'were familiar' and 'ongoing' and that Aboriginal knowledge is deeply understood by community and family as 'holistic', 'collaborative', 'forever changing' and 'interconnected'.

The following narratives gifted by the Aboriginal women in this study provide insights about a rich collective planning culture. For example, statements about sharing power included *'power increases when it is shared', 'shared leadership strategies'* and *'recognising the benefits of 'shared power''; 'Aboriginal people have a healthy disregard for authority'*. Statements linked to planning include reference to the *'use of yarning circles to generate conversations about planning' and 'bringing attention to the things that don't include us'*.

Collated comments from the Aboriginal women leaders and women attending the workshops that make reference to Aboriginal knowledge statements, included: *'Aboriginal knowledge, it's all there all the time', It's about the future and past being like one'; 'Knowledge as*

*continual, never stagnant', 'Aboriginal knowledge is all about preservation and survival, not just progress'. 'Knowledge is not there to be stored', 'Aboriginal knowledge is understood widely as a teaching tool for the next generation'.*

Statements about planning processes included '*we don't go ahead and do anything without establishing those core values'* and *'Aboriginal people always tend to plan from the end to the start. It's never linear'. 'There is always a holistic vision'. 'Yarning is cyclic', 'there is no end point to planning… it's always about constructing, deconstructing', reconstructing'. 'There is no personal bias in cultural planning', 'it is always, and all about nurturing the planning process'.* These statements strongly pre-figure and mirror collaborative design practices in the case study sites and provide new language that exceeds the largely technicist and procedural planning discourses currently dominating.

As well as consideration of 'planning' discourses, the inclusion of Aboriginal 'knowledge creation' discussion has the potential to challenge teacher understandings about what knowledge is and can be and how to draw on diverse knowledges and why. For example, if teachers reflect upon and apply the following conceptual understandings related to knowledge creation practices when designing a program of learning, their thinking, epistemologies and ontologies will be challenged.

Descriptions of knowledge creation include, for example, *knowledge that is inseparable from land, place, spirit, language, kin, law, Story; knowledge that is developed, retained and shared for innovative thinking; knowledge as a changing force that flows from land, spirit and Ancestors and is constantly evolving; knowledge that draws upon nature-based metaphors for deeper understanding of abstract concepts, as well as using ecosystem-like webs of knowing; knowledge that involves repetition, and returning to concepts for deeper understanding and cyclic views of time and processes; knowledge that recognises that when opposing knowledge perspectives meet, the result is new creation rather than conflict and destruction; knowledge that draws ideas from many language groups, as opposed to dominant cultural thinking.*

It is very important, however, to recognise that

> *even though these descriptions have been laid out, they're all one. You can't have one without the other. In the future we need to put visuals to these descriptions, because we need to make these terms more practical'* (AL3).



The understanding that different forms of knowledge exist interdependently and values exist only in relation to other values, challenges schooling traditions and provides momentum for the inclusion of interdisciplinary standpoints to meet future planning challenges. Engaging with alternative knowledge systems provides a much-needed 'third' space; a space of not knowing, of seeking understanding and of mutual respect' (USQ, EATSIPS, n. p) for teachers to think collectively (See Chapter One, Key Issue 7, p. 39),

Aboriginal knowledge creation practices and value systems provide opportunities to 'come to knowledge' by sharing and engaging with thinking inspired by considering *'knowledge creation capacity of educators', and the use of terms like* '*holistic*', *'deep narrative'*, *'communal knowledge'*, '*Elder knowingness'*, *'intellectual biomimicry'*, *'circular logic'*, *'synergistic knowledge'*, *'Indigenous pluralism'* (Yunkaporta, 2007). When teachers plan learning collectively, consideration of other knowledge creation practices and value systems such as *reciprocity, respect, equality, responsibility, survival and protection, spirit and integrity* (Yunkaporta, 2007) support teachers to think about knowledge differently. For example, considering knowledge from *'how knowledge can be retained and shared for innovative* thinking' rather than stored and retained for power'. Yunkaporta talks about 'ccommunal modes as ways of 'coming to knowledge' that involve the sharing of knowledge between people' (2009, p.126) and this study suggests that collaborative design practices position teachers to 'come to knowledge,' differently as a way of challenging teacher thinking about planning, teaching and learning.

The inclusion of Aboriginal 'knowing' in learning design frameworks is a way to reclaim Aboriginal 'knowledge creation' and planning in mainstream education contexts. *'Reclaiming Indigenous planning includes connecting the past and the present to facilitate Indigenous planning for the future' and 'rethinking planning practices that include traditional knowledge, cultural identity and control and care over land and resources'* (Walker, et al, 2013, p.1). Walker is describing planning for sustainability of culture and resources, and his comments could just as easily apply in education contexts.

The following data include examples of teacher comments that reflect the emergence of Aboriginal 'knowledge creation practices' in interdisciplinary contexts. For example, knowledge in interdisciplinary design contexts is often described as holistic. *'Holistic*

*Knowledge'* is knowledge that is *'inseparable from land, place, spirit, language, kin, law, story*' (Yunkaporta, 2007, n. p). A lead teacher in one of the case study sites discussed how the *'school's strength is their commitment to interdisciplinarity; it provides everything; relationships, curriculum'*. This holistic knowledge perspective characterises interdisciplinarity, as a driving force for change, individually and collectively.

Another teacher talked about '*operating socially, that's our strength and then coming here, just triggered opportunities to collaborate'.* Operating socially is suggestive of collaborative understandings and actions. They reminded us that '*the walls between subjects are extremely fluid…. It has helped me learn from a whole range of people's perspectives'.* After a year of working in an interdisciplinary design context this early years teacher was thinking holistically and looking for ways to connect knowledge across subjects: '*When I look at a topic now, I go, alright, well how is this applied, how can we connect it to this? So, there's a massive difference'.*

Searching for and making connections enables teachers to 'learn in context' and connect with other teachers; their knowledge, their stories, other spaces and narratives that inspire teacher learning and help transform practice. The understandings that develop as a result of the connections build teacher 'capacity' and increase the effectiveness of a group of teachers' (Levin et al, 2008, p. 295). 'Capacity building is not about a one-way transmission of knowledge' but requires 'learning in context' (p. 296).

In relation to increasing the 'effectiveness of a group', Aboriginal teacher leaders and the Aboriginal Co-Facilitator of the Reclaiming workshops (See Appendix #2) discussed the importance of *'communal knowledge and passing on knowledge as a social obligation, a responsibility…. It's like a basket, it's woven knowledge'.* It is understood as a social obligation and the role that kinship structure plays is in ensuring the maintenance of social obligations such as the passing on of knowledge. The limited passing on of learning programs designed by teachers in schools raises important questions about how teachers see and experience their role in relation to the succession of curriculum knowledge, including the preservation and maintenance of programs of learning. Schools with a focus on professional collaboration and those that are engaged in designing learning collaboratively are more likely to be routinely fulfilling '*social obligations'* of passing on knowledge to future



generations of teachers. The Co-Facilitator of the workshops described everything as interconnected and interwoven and the important outcome was about

> *'survival and protection and the protection of communal knowledge for our 'spirit and integrity'. 'We all need to be engaged in renewing systems because otherwise it is about protecting something that's broken'.*

Aboriginal values and knowledge creation practices are visible in interdisciplinary design processes in the case study schools. For example, from a collective ownership and '*communal knowledge'* perspective, that *'ensures knowledge is not collected and stored for personal power and ownership by individual specialists, but is developed, retained and shared for innovative thinking'* (Yunkaporta, 2007, n. p). Collective ownership of knowledge and collective responsibilities for knowledge creation and sharing is central to the collaborative design experience of teachers in the key case study sites. A teacher leader explained,

> *I think collective ownership of curriculum is incredibly important. Personally, I'm very proud that it exists, like people have put the effort in and it's exciting to see the students engaged, and teachers saying I don't need to be here.*
>
> *If you've all sat down and written that curriculum, you all want to make it work and …you all have that vested interest in making it work. If one person has given you the unit of work that you haven't seen before, it's not yours, you wouldn't have written it that way. There's a difference. There's that real sense, that collective passion that motivates and gives you a reason to get on with it.*

Yunkaporta describes 'Ancestral Knowingness' as a changing force that is constantly evolving and the urge to learn comes from within. This internal basis for knowing develops learning autonomy (2007, n. p). An early career teacher stated,

> *we're part of a community and there's politics to consider; there's so many different layers to this thing and, teaching is there but there's all this other stuff going on and if you care about the teaching you've got to manage all that stuff too in order to get your ideas heard and get some sway over things.*

Getting your ideas heard, to gain some control over what to include in the design of a program of learning, is part of the responsibility of a teacher in collaborative design and supports a sense of collective autonomy. This has links perhaps to Ancestral Knowingness', defined as the *'urge and capacity to learn'*; '*the internal basis for knowing that helps develop*

*learning autonomy'* and collective autonomy understandings. An early career teacher comment reflects a sense of collective autonomy.

> *Leadership trust us to develop curriculum that's appropriate and engaging, and so if we develop something, it's not a case that we need permission to implement it. The teaching team … have free reign. We could teach them dancing or something like that and I guess at some point they'd go, why are you teaching all the students dancing instead of Science? but it would take a while.*

'Intellectual Biomimicry' knowledge creation practices are described as a process that allows people to draw upon nature-based metaphors for deeper understanding of abstract concepts, as well as to use ecosystem-like webs of knowing that mirror complex natural patterns suited to solving new millennium problems (Yunkaporta, 2007, n. p). The metaphors teachers chose to describe the collaborative design process helped them articulate the issues and the complexity of the process. Consideration of metaphors provides a sense of clarity about the collaborative design process. Another early career teacher talked about a process that

> *occasionally sprouts new tendrils (new knowledge). A process that becomes multi-dimensional, where you see your peers in a different light; with the complexity of the human spirit and where you are able to dismantle this idea, 'he's a maths teacher' or 'she's a science teacher' so there is that interchange of ideas to design it and you take that enthusiasm to the kids.*

The use of nature based, 'dynamic' metaphors also align with Klein's understandings about the use of dynamic metaphors to describe twenty first century 'work' compared to 'static' metaphors used last century (Klein, 2000).

**'**Circular Logic' knowledge creation involves repetition and returning to concepts for deeper understanding and cyclic views of time and processes. It is a deeper, complex way of reasoning (Yunkaporta, 2007). Interdisciplinary planning similarly demands that teachers work with complexity across subjects and keep returning to programs created, for revision and additions to ensure the learning aligns with relevant issues, new thinking and knowledge. From a school system perspective, however, there is very little momentum to encourage sustainable reflective design practices to support teachers in their endeavours to plan in more sustainable ways so that programs of learning and teacher knowledge can be more routinely shared, adapted or built upon. This is in contrast to assessment moderation practices introduced as part of a senior years 'standards'-based curriculum that have attracted funding for collective reasoning and where teachers have opportunities to collectively make assessment decisions. As a consequence, moderation and assessment processes are increasingly collective and cyclic and are driven from both a system and



individual school perspective. At this stage, however, collective and cyclic 'planning' or routine planning is not provided with the same attention or funding.

A cyclic repetitive process enables teachers *'to return to key concepts for deeper understanding and more cyclic views of time and processes'.* It also helps to build relationships and 'collective responsibility' for programs created. The act of interdisciplinary thinking and planning also dissipates hierarchies of knowledge in schools that marginalise particular knowledge in curriculum. The following statement by an early career teacher reflects the idea of 'collective responsibility; for programs of learning created collaboratively.

> *It is kind of like sport where you go through a season and then you develop as a team, and you get something at the end of it where you're really happy. Not only have you got this positive experience with working with those people, but a positive experience of working in a team, and knowing that that process can be really beneficial if it's done right.*

*'Synergistic knowledge'* creation has evolved from the Aboriginal principle that when opposites meet, the result can be new creation rather than conflict and destruction. Tension and balance between opposites, as observed in nature, is considered the source of new creation and social cohesion for many Aboriginal language groups (Yunkaporta, 2007, n. p.).

Synergistic Knowledge creation reflects the very essence of interdisciplinarity knowledge and planning across subjects. One of the STEM sites for example has designed programs of learning from a STEAM approach (that includes Arts understandings). Instead of teachers from physics and art faculties ignoring each other, they have collaborated to design and plan STEAM programs about energy from wind and the design of wind sculptures.

All design practices rely on the '*tension and balance between opposites'* which is the source of both new creation *and social cohesion* in interdisciplinary design contexts. Engaging with complexity that includes working with disparate knowledges to design learning creates *tension and balance between opposites.* This is evident in a statement about the interdisciplinary design process.

*'When designing learning collaboratively the learning experience makes you think differently'. There are no, 'no's'. My ideas are of value amongst other staff". "A certain synergy is achieved because "If you've all sat down and have written that curriculum, you all want to make it work and all have that vested interest in making it work'.*

'Indigenous Pluralism' is about diverse ways of knowing that draws knowledge from many

language groups (Yunkaporta, 2007, n. p). Interdisciplinary design work could equally be described in pluralist terms as 'acknowledging the gifts and limitations of every knowledge system and moving beyond either ors' toward 'both and mores' (Andreotti and Pashby, 2013, p.433). Teachers in 'collaborative design' contexts are embracing complexity because it makes sense to do so personally and professionally. A pluralist existence, however, can also mean working without acknowledgement because interdisciplinarity and planning continue to challenge dominant disciplinary planning perspectives.

'Deep Narrative' knowledge creation practice *'is the vehicle for all the 'ways of knowing' and contains complex information, more so than western exposition, which tends to fragment knowledge for specific scrutiny and separate it from cultural/land/social contexts'* (Yunkaporta, 2007, n. p.). The work of Chen and Hong (2016, pp.266-268) has been used to highlight the design work of teachers using 'deep narrative' approaches.

Interdisciplinary design contexts demand that teachers engage in *'complex reflective processes, contemplating a broad range of ideas and design options'* collaboratively for periods of up to two years (in the case study sites). During this time teachers are required to '*rigorously voice and defend their thinking'* about the inclusion of particular knowledge concepts. Programs also demand 'constant revision to cater for new learning and new knowledge and teachers are required to 'engage in iterative cycles of dialogue, reflection and information processing and articulation and assessment of personal beliefs surrounding key ideas and concepts presented'. Teacher efforts to create coherence with the mandated curriculum, is also an ongoing responsibility to ensure students achieve at the highest-level possible. 'The freedom to discuss' in interdisciplinary planning contexts, is perhaps the highlight of the design experience for an early career teacher who talks about

> *the most useful times when we have freedom to discuss things for quite a while, amongst ourselves. Then all the stories come out, like the insights start to come out when the conversations get rolling, and you pick up things that you haven't heard before* (ECT4, 399).

**Concluding Comments**

Teachers in collaborative design contexts are continually investing their cognitive and expressive capacity in new learning with up to twelve other teachers in a 'third' space context, 'a place of not knowing' (USQ, Open Desk, n.p). The process engages them in



challenging discourses about core beliefs, knowledge, understandings and ideas about teaching and learning. For teachers, planning is so intertwined with teacher work practices and identity that it requires ongoing renewal and opportunities for teachers to escape from dominant knowledge sources and reference points. Alignment of planning practices with less dominant cultural values and knowledge creation considerations invites opportunities for teacher engagement in 'other' knowledge to keep alive alternative possibilities for existence as teacher and creator.

Aboriginal knowledge and understandings in mainstream planning practices enrich our worldviews and our ways of being, knowing and doing as teacher (Martin et al 2003). It is also fundamentally about teachers asking the question about 'whether or not justice can be imagined from within the available modalities of knowledge' (Silva, 2014, p.103). This study suggests teachers designing curriculum and working deeply with knowledge, are more likely to ask these questions.

**SECTION 8:**

**METAPHORS TEACHERS USE TO DESCRIBE THE**

**COLLABORATIVE DESIGN PROCESS**.

| *Key issue identified* | *Key question arising* |
|---|---|
| Limited understandings about the collaborative design process. | How are teachers collaborating to design interdisciplinary programs and what's it like? |

This section reflects on teacher choice of metaphor to describe what it is like to design Integrated Programs of learning with other teachers. Site-specific metaphor analysis is included in each of the key case studies and this final document provides a more holistic analysis of teacher choice of metaphor across the key case study sites. This is followed by a summary discussion of chapter eight to bring together key learning from the various sections presented.

Metaphor analysis contributes to the question about w*hat it's like to design Integrated Programs collectively?* Consideration of metaphors helps teachers reflect on their experience of designing learning collaboratively and provides opportunities to get to the core of what is most true about designing learning collaboratively.

During interviews, teacher choice of metaphor was usually backed up by a description about why the metaphor was chosen. For example, one teacher described planning learning collaboratively as *'breaking free'* and then suggested *"it's like teachers who have been screaming to get out of a box, finally getting out of the box".* So *'metaphors are not just combinations of images, metonymies, similes and other rhetorical figures of speech used to embellish language, they are tools which forge social relationships with the outside world'* (Tomelleri, Lusardi, Artiol, 2015, p.8).

Klein too (2000) points out that over the course of this (and last) century, metaphors of knowledge have shifted from the static logic of a foundation and a structure to the dynamic properties of a network, a web or a system.



Opportunities for teachers to reflect on metaphors to describe practice, particularly when something new is developed, present opportunities to discover what is most important about a practice and what really matters and why.

From a metaphoric perspective, interdisciplinarity can be explained as exercises in explaining to one another the multiple ways in which we are

> metaphorising' our individual metonymic landscapes and how we might actually rearrange the territory, so that we can use one another's metaphors to alter our own metonymic landscapes (Chettiparamb, 2007, p.22).

'Metaphorising' can be understood as a strategy, therefore, that supports the emergence of interdisciplinary thinking and planning and perhaps helps teachers to explain the complexity of the integration process itself. Sharing and articulating both interdisciplinary and disciplinary metaphors in a collaborative design space could be helpful to teachers as a bridge building opportunity across subjects.

Metaphors collated across the key case studies in this section are categorised as Static (S), a network (N), a web (W), a system (S), or as a description of an image that reflects a practice that is somehow transformative (T) in terms of teacher relationships, teacher knowledge or teacher practice, from individual to collective. See below Table 8.3: Metaphors imagined by teachers designing learning collaboratively.

Table 8.4: Metaphors imagined by teachers designing learning collaboratively

| |
|---|
| *A beehive.... the bees are crawling all the way around and they all get all sort of mixed up. Even though they've got their own little hole, they're allowed to go and visit everybody else (N)* |
| *It's like finding Nemo: like a giant school of fish that you just can't control (N)* |
| *It's like a bucket of swirling coloured water … you pour in all the subjects (all different colours) Integrated Programs are represented by the colour red and it doesn't turn brown like the others (T).* |
| *Rollercoaster: It dips sometimes, but you know it's good. There's something exciting in front. You'll have to re-think some of these ideas, but that's fantastic (T)* |
| *It's an organic way of working. There are shifts and changes the whole time. It's organic. It's not just us that changes, it's leadership that shifts and changes the whole time. Its organic like the approach we have towards interdisciplinary thinking and planning. It changes, and we need to revisit, refine, adapt collectively (N)* |
| *In some ways the integrated curriculum pretends that there are no boundaries but at the end of the planning there is a thing that works, but could it be better? You have to ask the question; did we actually destroy something of value here or did we merely do what everyone else does? I'm a physics teacher but I teach chemistry and therefore I need to ask how does physics make sense in terms of chemistry? (T)* |
| *Growth, growth. It's really organic and it links to the personalisation of learning (N)* |
| *It's like football "You're kicking with a team. You're a team playing the same game … and everybody's got a particular skill set that helps the team win….". (S)* |
| *Massive Synergy, When it's going really well there's synergy there, there's massive synergy. It's where genuine educators want to be, in that space". "This whole process becomes multi-dimensional, you see your peers in a different light, with the complexity of the human spirit. You dismantle this idea, he's a maths teacher, There is that interchange of ideas to design it and you take that enthusiasm to the kids.(S, T)* |
| *It's like football: we all play a part to make it come together (N)* |
| *Something organic: a living thing; dynamic, squishing around, evolving, and occasionally sprouting new tendrils. (T)* |
| *Freedom: like teachers who have been screaming to get out of a box, finally getting out (T)* |
| *It's like combining food on a plate to find the real goodness: You don't go out for a meal an have vegetables and then you have meat, like everything is mixed together and that's whe the goodness is, that's where the interesting things happen! (T)* |



**Concluding Comments**

Most of the metaphors are best categorised under the 'transformative' category and the network category. They are transformative because they reflect changes in teacher practice about how they plan, teach and also how their think and learn. Teachers talk about '*seeing their peers in a different light'* or *'dismantling ideas'* about 'being, knowing and doing' (Martin et al, 2003) as teacher. Ideas that have obviously challenged changed and transformed teacher practice.

So, what are we really talking about when teachers describe the experience of collaborative design as *'a massive synergy'*, '*a school of fish'* or *'a beehive'?* Collaborative design metaphors provide insights about the collaborative design experience about the relationships formed and the process of integrating subject knowledge and engaging with multilayer curriculum determinants, simultaneously and about the significance of learning and designing learning with others. Fortunately teachers value the idea of themselves as learners and 'valuing self, as learner is 'one of three most important features of successful collaborative schools' (Gruenert, 2005, p.15). An early career teacher who described the design process as organic identified:

> *the shifts and changes that are required to design and teach Integrated Programs is a process that is organic. It changes and we need to revisit, refine, adapt collectively. It's evolving and occasionally sprouts new tendrils [new knowledge]. It's a process that is multi-dimensional, where you see your peers in a different light; with the complexity of the human spirit and where you are able to dismantle this idea, 'he's a maths teacher' or 'she's a science teacher' so there is that interchange of ideas to try and design it and you take that enthusiasm to the kids.*

This study supports metaphor analysis in curriculum reform contexts so teachers can share metaphor and consider what is most true about teacher practice. 'Metaphorising' therefore could be understood as a strategy that supports both the emergence of interdisciplinary thinking and planning and supports teachers to also navigate the complexities of the integration process.

**KEY LEARNINGS FROM CHAPTER 8**

This chapter has reflected upon data from the key case study sites as well as data from four additional sources that include contributions from the Aboriginal women's workshops, official SACE data about the subject 'Integrated Learning in the absence of data about the

'Integrated Program', a detailed description of an integrated planning process and analysis too of a post interview survey about teacher dispositions, motivations and school culture factors so teachers can collaborative to design learning. The diverse evidence demanded deep reflection on what teachers are saying and the data evolved as a series of 'standalone' sections that reflect a process not dissimilar to Aboriginal 'circular logic': understandings about knowledge creation that involves a certain amount of repetition and a return to key concepts for deeper understanding and cyclic views of time and processes (Yunkaporta, 2007, n. p).

Learnings from each section are brought together in this concluding section of the chapter, Key concepts, revisited to better understand the data, included contradictions, capacity building, Interdisciplinarity, knowledge creation, Aboriginal values and knowledge creation practices, planning concepts, and understanding metaphor in capacitating teacher voice. The various sections reflect Engeström's Activity Theory (2000) in following a cycle of expansive analysis and learning for both researcher and reader.

Analysis also provides opportunities to articulate resolutions to key issues identified. The key learning discussion is mostly sequenced according to the presentation of the various analysis sections (1-8). First the contradictions identified in the data suggests policy decisions about teacher collaboration impact on teacher work but often without due consideration about what this means for teacher practice. It follows therefore that opportunities need to exist for contradictions to be identified locally and systemically through ongoing teacher identification, discourse and analysis so they can be addressed and hierarchies of power and control dissipated so teachers can get on with what they do best, which is 'collaborate very effectively' (Salonen et al, 2015).

> When knowledge is considered collectively it is likely that knowledge, collectively and individually, will advance because collaborative design is embedded in broader worlds of knowing, with knowledge advances driven by forces within and between (school) communities (Chen et al, 2016, p. 5).

So, when teachers collaborate to create something new such as an Integrated Program, by sharing, articulating knowledge, by challenging, synthesising, re-conceptualising, deconstructing and reconstructing knowledge, it is likely that learning achieved will be



beyond that achieved by an individual teacher applying a disciplinary standpoint. The finding that all teachers interviewed intend to seek future collaborative planning opportunities, despite the complexities involved, reflects teacher curiosity in working differently and deeply with knowledge to advance their own knowledge and provide relevant student learning opportunities as well.

It is also very significant that when programming is collaborative and prioritised, programs created are more likely to be sustained; some for more than decade in the case study sites. When teachers work as creators, rather than implementers too, teachers have a personal and professional stake in the work achieved over the longer term. Consequently the most influential capacity building resolutions cited by teachers in this study relate to sharing knowledge and planning learning together routinely. Sennett observes and this study agrees, that synthesis of knowledge collectively 'changes the control of knowledge' and potentially triggers the momentum for more change (YouTube, 2012). Illustrating the building of capacity through discourse and collaborative design, therefore, is this study's contribution to capacity building and collective excellence research.

Analysis of official SACE data about the popular subject, 'Integrated Learning', suggests teachers seek greater autonomy and more integrated planning options. The success of this subject (reflected in strong student enrolment and SACE success) has resulted in the SACE Board, in 2014, scaling up opportunities for students to complete an additional Integrated Learning subject at Stage 2 of the SACE. This is an example of a system acknowledging the wealth of curriculum knowledge that exists schools. This outcome is evidence that autonomous and integrated approaches have generated not just student success but teacher professional identities (knowledge, autonomy and networking capacities) that are often not planned for, but deserve a greater focus.

This study strongly supports a focus on how teachers collaborate for knowledge creation in an increasingly interdisciplinary and collaborative world (Chan, 2011). It is a goal that calls for time, resources and policy commitment to professional collaboration to design learning. In the case study sites interdisciplinarity is the vehicle of choice to drive a knowledge creation agenda. Teacher claims suggest that collaborative design work positions teachers not only to learn from each other's accumulative knowledge, disputed by Schleicher (2012), but also

ensure teachers develop the capacity to collaborate and innovate and develop new ways of working with curriculum. Teachers' learning from each other's accumulated knowledge in planning learning contexts is a topic for further research.

Analysis of the post interview survey about dispositions, motivations and school culture factors that make a difference affirms teacher resolve to engage in collaborative planning and, significantly too, teachers interviewed have become advocates for collaborative standpoints. An early career teacher, talked about the teachers

> *being more collective as a profession and having this collective idea that we (all teachers) are jointly responsible for improving the profession and improving what's happening in schools.*

'Collaborative design' has been described by Davis el al, as

> *the glue that brings creativity and innovation together and ensures that an idea leads to an outcome* (Davis, 2013, p.15).

This is the essence of what can be observed in the case study sites; a practice linked to new ideas, new knowledge, new ways of planning and being a teacher and importantly as evidenced in a school with a focus on 'well-being', this practice can 'lead to strong SACE student outcomes' as well as the creation, sharing and maintenance of programs created. This is in contrast to individualised planning practices where programs are rarely shared, except with the SACE Board for quality control purposes, nor are programs usually carefully maintained, deconstructed or reconstructed routinely, with new knowledge and understandings for generations of teachers that follow. A focus on collaborative planning and intergeneration access is required more broadly in all planning learning contexts.

Analysis of data also suggests collaborative practice does enable teachers to practice core beliefs and teachers interviewed credit interdisciplinary thinking and planning as a vehicle for the realisation of teacher core beliefs about teaching and learning. For example a teacher leader responsible for the organisation of teams to plan Integrated Programs described how the collaborative design process transforms teacher thinking and practice from disciplinary to more interdisciplinary standpoints. STEM reform initiatives too, nationally and internationally model 'professional collaboration'; *'interdisciplinary thinking, 'integrative synthesis'* and structural change as drivers of reform. Engagement in integrative synthesis planning processes is important in persuading teachers to consider interdisciplinary and collaborative



design standpoints. An emphasis on professional collaboration, knowledge sharing, teacher autonomy and routine teacher networking should be more visible in the senior years of schooling to better reflect the world beyond the classroom and the role of teacher as researcher and knowledge creator in our schools.

The identification of Aboriginal values and knowledge creation practices in mainstream planning contexts challenges dominant disciplinary knowledge creation practices. 'Collaborative design' is a transformative, innovative and sustainable practice yet for many teachers engagement in interdisciplinary planning remains outside their terms of reference. Aboriginal knowledge creation with a focus on 'holistic', 'collaborative', 'forever changing' and 'interconnected' guiding principles provides access to diverse and collaborative ways to design learning. Aboriginal voice needs to be positioned to contribute to the planning in schooling through values, knowledge creation, discourse and metaphor, as shared by Aboriginal women in this study.

When knowledge is understood as '*being there all of the time'* and when *'future, present and past is as one'* and *'knowledge is continual and never stagnant',* these understandings reveal multiple opportunities for the design of learning. Collaborative planning is about continually reflecting upon past, present and possible future knowledge perspectives and building upon, maintaining and renewing and sustaining programs of learning. It is about preservation and survival concepts and knowledge creation practices that are teaching tools for the next generation of teachers. Many of these understandings reflect collaborative design practices identified in the key case studies. The search for a different narrative to plan Integrated Programs draws upon the knowledge gifted by Aboriginal women attending the reclaiming values and knowledge creation workshops (See Appendix #2).

The upcoming final chapter reflects on professional collaboration over time and provides a response to the key questions about collaborative design and teachers reclaiming professional practices. The chapter reflects too on the importance of 'collaborative design' particularly in interdisciplinary and integrated planning contexts and provides an Interdisciplinary learning design framework inclusive of Aboriginal planning considerations for teachers involved in collaborative design work.

# CHAPTER 9

## THE IMPORTANCE OF COLLABORATIVE PLANNING

### INTRODUCTION

This study began with a personal account about the experience of teaching over four decades that recalled collegiality, curriculum and pedagogical autonomy as well as an enduring sense of collective efficacy (Bandura 1997, Eells, 2011) about being part of something that was important. Reflecting upon professional experiences over time has its limitations, but my experiences fit comfortably within Hargreaves' (1994) descriptions of the key features of professionalism from a historical perspective. He presents a sequence, from the age of the 'autonomous professional' in the 1970s, followed by the age of the 'collegial professional' in the 1980s and into the 1990s where collaboration and common purpose was encouraged, and then the 'post-professional' age that reflects some of the current professional experiences of teachers Hargreaves describes as a 'struggle between forces and groups intent on de-professionalising the work of teachers' and teaching (Hargreaves, 2000, p153).

This study has identified and analysed collaborative curriculum planning practices that recognise the importance of 'a collective teacher identity' to reclaim and rebuild teacher professionalism for teachers' ultimate 'survival and protection'. 'Survival and Protection' is a core value identified as relevant to Aboriginal and Torres Strait Islander health protection ethics. It is also relevant for consideration in supporting teachers to reclaim professionalism, including their capacity to collaborate (NHMRC), 2003).

Collaborative design practices provide a basis for teachers to collaborate and in the process reclaim a sense of a more collective form of professionalism



that includes, for example, a focus on teacher knowledge, teacher autonomy and networking opportunities. In the case study sites, the South Australian Certificate Education (SACE) reforms have motivated teachers to engage in collaborative practices to design Integrated Programs. In the process teachers are sharing and creating knowledge as part of the synthesis of interdisciplinary knowledge to design learning. In the process they are getting to know how other teachers think, create and innovate and are also recognising opportunities to reclaim and develop core professional practices.

As noted throughout this study, the study builds upon the work of Salonen et al, (2015) who describe some of the most important elements of a teacher's work as *'co-operation when constructing, de-constructing, and re-constructing knowledge; planning together; team teaching'.* They also talk about teacher capacity to interact effectively as the *'mutual core competence of a teacher'* (2015, p.8). This study suggests that 'schooling' has been slow to adjust to a society that is increasingly interdisciplinary in thought and human endeavour and therefore requires teacher collaborators to successfully navigate collaborative contexts in which teachers are increasingly required to work. The past decade has included a focus on curriculum reforms that include collaborative and connected standpoints as well as accountability measures that demand a greater focus on teacher professionalism which is often not prioritised.in busy schooling contexts.

In research on lifting educational achievement through collaboration in Australian schools, Bently and Cazaly (2015, p.5) refer to professional collaboration deeply embedded in the culture and organisation of their case study schools and they list the uses of collaboration to support, sustain, evaluate and refine professional learning about teaching and learning, accessing expertise, data and relevant practice.

Despite such findings, in many traditional schooling contexts, collaboration is largely achieved in addition to rather than as part of core teacher work and because teacher collaboration is taken for granted, rather than as a core practice, it is difficult to challenge. Collaboration has become a panacea for all

things educational with teachers bearing the ultimate responsibility to make it happen. Lingard observes policy settings are set a long way from school with very little teacher input and teachers continue to feature generally as non-thinking implementers of policy. Lingard suggests the need for a 'new social democratic imagery' *'to underpin policy geared genuinely to achieving laudable goals*' (2011, p.243) such as 'recognition of the centrality of informed teacher judgment' including in policy development'.

Attention to the details of collaborative practice in schools, as presented in this study, needs to include a system wide focus. Gonzalez reminds us that when collaboration work intensifies, new responsibilities emerge (2014) as is evident in the case study sites and in comments teachers make about design complexity. As collaborative and networking responsibilities continue to emerge, attention to teacher capacity and professionalism to plan, teach and learn in more networked and collaborative ways will be required.

This study identifies schools, which are already successfully supporting teachers to collaborate to design Integrated Programs, rather than designing learning using stand-alone subject frameworks. This study suggests the Integrated Program, introduced as part of South Australian Certificate Education reforms (2012-2017), positions teachers to share knowledge and collaborate to design learning. Analysis concluded collaborative design practices supports teachers to reclaim and build strong professional collective identities related to teacher knowledge, greater teacher autonomy and the capacity to collaborate effectively.

**RESPONDING TO THE RESEARCH QUESTIONS**

In responding to the key questions, this chapter makes reference to the eight complementary sections concerning the analysis of data in chapter 8. The key questions ask



- *How does the practice of designing learning collaboratively help teachers reclaim professional practices, in the senior years of schooling?*
- *How do schools build teacher capacity to work within and against SACE policy to develop rich interdisciplinary programs?*
- *How are teachers collaborating to design Integrated Programs and what is the role of teacher as creator of knowledge in collaborative planning contexts?*
- *What metaphors best describe a teacher's collaborative design experience?*
- *What could a learning design framework look like that is inclusive of Aboriginal standpoints to create knowledge and plan learning collaboratively?*

The key question asks how designing learning collaboratively helps teachers reclaim professional practices. Answers to this question are evident in each of the case studies and include claims teachers make about collaborative design experiences and working deeply with interdisciplinary knowledge. Teacher experiences of collective autonomy to design learning collaboratively in teams is also included, as are teacher experiences of the collaborative design process. By collaborating to design learning, teachers are positioned to engage in ongoing capacity building discourses and practices that promote the key elements of professional teacher practice and the transformation of teacher practice and epistemologies about education, teaching and learning as a result of their immersion in the collaborative design experience.

In each of the case studies contradictions that impact on professional practice are identified so education stakeholders can address issues arising that impact on teacher professional practice. The identification of contradictions is a key element of the design of the research.

Teacher professionalism claims in this study are categorised with reference to just two of Bourke et al's six definitions of teacher professionalism (2013); 'assertive professional' and 'aspirational resistance' because the claims teachers have made about their practice are distinctively about 'leadership'

objectives and not performativity. The strong representation of leadership claims made by teachers interviewed suggests 'collaborative design' contributes to the development of school leadership cultures and the professionalism of teachers.

The study makes particular reference to early career teachers, some with PhDs, who have been part of a workforce strategy to encourage practising scientists to consider a transition to teaching. Their enthusiasm and commitment to interdisciplinarity specifically, and to teacher professionalism is very convincing across the key case study sites. A school leader observed that *early-career teachers with PhDs 'really get the interdisciplinarity stuff*'. This study suggests they really 'get' 'professionalism', too. This finding can be built upon to continue interdisciplinary progress in senior secondary contexts.

Claims teachers make about the transformation of practice are particularly important in a study about teacher practice and are identified in each of the case studies with reference to Andreotti's (2012) discussion about the transformation of practice related to educators' epistemological understandings about knowledge, curriculum, teaching and learning. Claims teachers make about their core capacity to collaborate also reflect teacher core capacity to collaborate as defined by Salonen et al (2015, p. 8). Each case study provides evidence of transformations in practice, from individual to more collaborative standpoints that affirm the considerable personal and professional investment teachers need to make to design learning in more collaborative ways. Collaborative design has significant implications for teacher practice but outcomes suggest it is worthy of the challenges to achieve a sense of greater teacher identity for teacher 'survival and protection' into the future.

Claims teachers make about teacher autonomy are aligned with Mausethagen et al, two 'dimensions of professional autonomy' (2015, p. 8): the *'will and capacity to justify and develop core practices'* and '*the will and capacity for self-governance'.* There was no shortage of claims that align with these two dimensions of professional autonomy in the key case study sites. Of particular



significance is the following quote from one of the group discussions that helps summarise a collective perspective about interdisciplinary planning in the senior years of schooling. It represents a call for teacher collective autonomy and for teacher identity as creator of curriculum, and clearly describes the distance that is often felt by teachers and schools engaged in interdisciplinary work in the senior years.

> *Interdisciplinarity goes completely against what the SACE Board has decided to do when teachers design Teaching and Learning Plans. It's about the teacher having that high-level involvement in designing learning based on student needs, based on what's happening in the world, whichever subject it is, and having that sense of ownership and tailoring that learning that makes education easy. It's because you're not teaching from a book, you're not teaching a prescribed program, you're teaching something that you and the class are interested in and enjoy, that makes education easy* (FGD1, T647).

Findings from the case studies about claims teachers make about building professional capacity are not conclusive. However, together they represent teacher resolve to want to collaborate to design learning and to continue to work with interdisciplinary knowledge as creators of curriculum. The claims teachers made during the study are convincing. They further suggest that the relationships formed and sustained, and the inspiring programs created, carefully maintained, developed and sustained over the longer term, are underpinned by significant commitment to collaborative practice, to interdisciplinarity and to work created by teachers when designing learning together. The fact that there are formal processes in place in two of the case study sites to maintain programs created collaboratively is very significant. It suggests respect for the work achieved, a sense of being part of something worthwhile and collective ownership of curriculum at the local level. Researcher experience suggests that programs of learning created by teachers across schools are usually not sustained over the longer term. The findings are backed up in the post interview survey that affirms teacher intent to seek opportunities to collaborate and create Integrated Programs. It is significant that all fifteen practicing teachers are prepared to change how they design learning; from individual planning practices using a single subject framework to being in a position to articulate their preference for designing

learning collaboratively in senior secondary contexts using an Integrated Program framework that requires interdisciplinary thinking and more collaborative planning approaches.

Teacher engagement in collaborative design in the case study sites has helped shape teacher professional identities and revealed teacher enthusiasm for engaging in and with innovative, collaborative design practices, if given the opportunity to do so. So, despite minimal interdisciplinary planning, teaching and learning being observed in senior secondary schools in Australia (Groundwater-Smith et al, 2009), this study suggests the innovative introduction of the 'Interdisciplinary suite' of subjects, including the Integrated Program, has delivered teachers multiple opportunities for interdisciplinary thinking, planning and learning, especially schools prepared to build teacher capacity 'to collaborate'. In these schools, including the case study schools, interdisciplinary planning, teaching and learning has gained significant integrity since the implementation of the newSACE (2008-2012). Learning from this study therefore suggests that teachers do not shy away from the complexity of interdisciplinary design challenges; rather, they embrace them because they provide opportunities to do something creative and innovative, with colleagues.

This study therefore contributes to our understandings about collaborative design practice to achieve innovative curriculum resolutions including in STEM contexts. Collaborative design in the case study sites has evolved naturally as part of a much larger education agenda to meet the needs of knowledge societies. The case study sites therefore could be considered examples of knowledge creation organisations because they are systematically producing new curriculum knowledge' as part of routine structures and processes. When collaboration work intensifies, as this study suggests, is inevitable, teachers will need to be able very cognisant of their roles as knowledge producers with the capacity to navigate a more connected, collaborative and interdisciplinary world.



**Building Teacher Capacity**

Another key question related to building teacher capacity with reference to the OECD teacher professionalism index that includes teachers sharing knowledge, teacher autonomy and the capacity to network (Schleicher, 2016, p37). As well as the claims teachers make about professionalism in the case studies, it is important to consider how the case study sites are building teacher capacity. Gilbert describes capacity as a

> 'Complex blend of motivation, skill, positive learning, organisational conditions and culture and infrastructure of support, put together, gives individuals, groups, whole school communities and school systems the power to get involved in and sustain learning over time' (Gilbert, 2011, p.14).

Designing Integrated Programs collaboratively multiplies the design, teaching and assessment complexities for all involved and requires identification of less obvious key drivers of 'capacity building' such as specific school visions and specific discourses. In the key case study schools, for example, school visions are about '*interdisciplinary thinking'*, *'student engagement', and 'student well-being'.* They represent 'big picture' capacity building objectives that are also the key leverage points from which the case study sites are progressing interdisciplinarity and capacity building reforms.

As discussed in the previous two chapters, the most influential capacity building resolutions identified are about building capacity through discourse and the development of new narratives and by listening and sharing ideas with other teachers. This precipitates teacher capacity to collaborate. As noted, synthesising knowledge collectively 'changes the control of knowledge' (Sennett, 2012, YouTube) and any changes in control potentially triggers the momentum for capacity building and changes to teacher practice. It also potentially triggers the needed organisational and structural changes required to support collaboration. This can be observed in the case study sites especially where teacher autonomy is prioritised culturally. Case study capacity building strategies also include '*preparedness to problem solve around an Integrated Program decision without thinking about all the structures that you've got in place that are going to stop it happening'; 'listening to and actioning teachers gut feelings for what may work'* in

an Integrated Program context; '*encouraging teachers to observe the gaps in student learning*' and '*actioning a bias to say yes, to teacher curriculum ideas'*.

Collaborative design practices encourage the development of all six enabling conditions described by Donohoo (2017) as presented earlier, (advancement of teacher influence, goal consensus, teacher knowledge about one another's work, cohesive staff, the responsiveness of leadership teams, as well as effective systems of intervention). Collaborative design enables these conditions because it is fundamentally about the listening and sharing of ideas. (For details about capacity building strategies in the case study sites see Chapter 8, Section 2, Engagement in collaborative planning and capacity building).

In addition to capacity building strategies identified by site leaders and teachers this study pursued additional capacity building strategies to address dominant western perspectives about 'collaboration'. Minimal understandings about collaboration has fostered unverified assumptions about teacher capacity to collaborate, so to address collaboration understandings it was necessary to seek other knowledge and value systems to capture the essence of teachers collaborating to design learning. The knowledge gifted by Aboriginal women provides a way to describe teacher collaboration and interdisciplinary design work. For example, synthesising curriculum content to design an Integrated Program engages teachers in re-imagining and rearranging knowledge, which is an intense problem-solving process that can be understood to resemble elements of Aboriginal knowledge creation practices. Creating an Integrated Program collaboratively is a form of, knowledge creation and a program of learning can be understood as *'a changing force that flows and is constantly evolving'* and '*when different knowledges compete for recognition* as in the design of an Integrated Program, *the result can be new creation rather than conflict and destruction'* (Yunkaporta, 2007), These sort of descriptions not only free up pedagogical thinking they offer opportunities to build teacher capacity so teachers are better placed to manage the abundance of new knowledge in interdisciplinary design contexts. Teachers could be well served by embracing Aboriginal planning standpoints to build professional capacity. Examples of the alignment of Aboriginal value systems and knowledge creation practices are included in each of the key case studies. (For details see Section 7, Chapter 8:



Aboriginal values and knowledge creation practices in mainstream planning contexts.)

**Working within and against SACE policy**

The study also asks how schools are building the capacity of teachers to collaborate to support teachers working within and against SACE policy to develop rich interdisciplinary programs that meet the assessment requirements of individual subjects. As well as the development of capacity building strategies implemented in the case study schools, teachers choosing the Integrated Program framework are showing their preparedness to work within and against SACE policy to meet the assessment requirements of individual subjects despite the fact it adds significant complexity to an already complex process. Doing something about it however, may impact negatively on teacher capacity to collaborate because teachers would no longer be compelled to collaborate across subject areas to design learning.

The fact that teachers are prepared to work within and against SACE policy, including the repackaging of student work to meet assessment requirements of each subject integrated is evidence enough of teacher commitment to collaborative design processes that highlight teacher capacity and expertise for example, 'in knowledge sharing (that) requires an effort of thinking and understanding, an ability to call into question one's own certainties, an openness to otherness or to the unknown, a desire to cooperate and a sense of solidarity' (UNESCO Report, 2005, p.159). On so many levels 'collaborative design' offers such a pathway towards a knowledge-intensive and creative profession. In the case study sites interdisciplinarity is the vehicle of choice driving a knowledge creation agenda that includes teachers as knowledge creators. (For details, see Chapter 8, document 4, 'Teacher as knowledge builder/creator.

The data from the stand-alone subject, Integrated Learning, shows that this subject provides opportunities for teachers to experiment with interdisciplinary and integrated knowledge approaches for planning learning. Analysis of official SACE data (2008-2012) indicates a significant increase in teachers using the

'Integrated Learning' framework to design learning. Increases in student enrolment in 'Integrated Learning' since the implementation of the newSACE 2008-2012 are noteworthy. Therefore in the absence of data about the Integrated Program, and despite the complexities associated with integrated approaches to design learning, this study concludes that teachers will continue to reach out for challenging opportunities to create rich integrated curriculum.

The most significant indication of a shift towards broader acceptance of teacher preparedness to work with interdisciplinary knowledge is the SACE Board's decision in 2013 to offer students an additional Stage 2, 20 Credit, 'Integrated Learning' stand-alone subject as part of SACE completion requirements. The decision to do so was influenced by students choosing to do this subject and by teacher interest in being able to determine the focus of a program of learning. Successful 'Integrated Learning' SACE outcomes achieved by students in this subject may also have contributed to this decision. (See SACE Board enrolment and completion data, Document 3**).**

**Teacher as creator of knowledge**

The study asks how teachers collaborate to design interdisciplinary programs and in the process seeks answers about the role of teacher as creator of knowledge. Analysis of collaborative design processes provides evidence about how schools can develop strong professional learning cultures. Much of what is described by a teacher leader in one of the case study sites is included in the *'Australian Charter for the Professional Learning of Teachers and School Leaders'* (AITSL, 2012). The Charter identifies characteristics of high quality professional learning cultures, evident in the case study sites that include 'school decisions to support ongoing teacher learning and risk taking; collective responsibility for improving practice; disciplined collaboration goals that relate to the learning needs of student and support for professional learning through school structures, including explicit planning and the allocation of time' (AITSL, 2012, p. 5). Section 6 in Chapter 8 provides an analysis of an interdisciplinary planning learning process in one of the case study sites that includes the key elements of a professional learning culture.



This study agrees that how people collaborate for knowledge creation is an increasingly important educational goal (Chan, 2011) and the collaborative design process positions teachers as creators of knowledge to progress this goal. Examples about how teachers are collaborating for knowledge creation are aligned with knowledge creation practices identified by Chen and Hong (2016, pp.266-288) that includes a willingness to embrace 'big picture' knowledge perspectives. An example of a case study teacher leader embracing big picture perspectives is evident in the following statement.

> *Teachers who work very well in interdisciplinary design environments understand that the big idea is what's important. It's the big idea that determines developments of scientific understanding and drives innovation or application, that's the important bit.*

Chen discusses reflective teacher practices, including an appreciation and articulation of education values and beliefs. In relation to knowledge creation practices an experienced teacher talked about planning learning collaboratively that

> *allows teachers, to actually put into practice their core beliefs, like we don't have the frustration with the artificiality of planning learning linked to the disciplines without context… No, we can actually do this in a really meaningful way.*

Chen includes *iterative cycles of information processing* to encourage knowledge creation practices, which is best illustrated by a teacher leader who talks about

> *time spent in meetings asking what each module group, of teachers was doing to make sure it develops those agreed connections. We expect the students to be able to connect the dots, so we as teachers need to know where those dots are so there's a lot of time needed here because teachers are thinking, is it productive? There's a lot of time needed to get your head around it. Everyone needs to be on the same page.*

Teacher 'investment in cognitive capacity for new knowledge' and 'new learning and engagement in problem solving' are identified as knowledge creation practices. For example, a teacher reflected,

> *one thing that I don't think we're doing as well as we could, is the area about neuroscience, like in the last five years that's just exploded, but we're not doing anything about it yet.*

Another teacher talked about the *'biotechnology modules not being cutting edge enough so there was negotiation with the Biodiversity team where it fitted beautifully because they were doing evolution'.*

Teachers across the case study sites are all involved in *'efforts to create knowledge and curriculum coherence'* identified as a knowledge creation practice by Chen. One lead teacher stated

> *there's that constant need and ability to challenge yourself as a teacher and consider why are we doing this? There's a lot of work involved in mapping the content and aligning what we have designed with the Australian curriculum standards to ensure we're not disadvantaging kids in any way.*

Teachers in the case study schools are engaged in knowledge creating practices and are 'creating knowledge' on how they go about the practice of planning and teaching. Their comments have strong connections to working deeply with knowledge, in largely autonomous teams to design learning and most significantly their comments reflect their capacity to collaborate. (For details see Section 6, Chapter 8: 'An interdisciplinary planning process' and Analysis Section 4, Chapter 8: 'Teacher as knowledge builder/creator').

**Metaphors to describe collaborative design**

To understand what it is like to design learning collaboratively the study asks teachers to think about metaphors that best describe their collaborative design experience. Consideration of metaphors helps teachers reflect on their experience of designing learning collaboratively and provides opportunities to get to the core of what is most true about designing learning together.

Opportunities for teachers to reflect on practice in this way, especially when something new is developed, present innovative opportunities to discover 'what is most useful in a particular context' (Murray, 2009, p.8) or, as in this study scenario, how teachers experience designing learning collectively. Metaphors imagined to explain collaborative design experiences were generally very dynamic or very organic and networked as observed by Klein (2000). Education could be well served by metaphor research, especially in



relation to education reforms and their impacts on practice, or as a way to compare reforms or to guide decisions about future reforms. Asking teachers about how they feel and what they experience through metaphor is an important gesture in interview situations because it can lead to ongoing discourse and greater clarity about the reality of the experience. (Metaphor analysis is included in each of the three key case study sites and in Metaphor Analysis, Document 8, about what collaborative design is really like.

**Aboriginal planning standpoints**

The final question asks what a learning design framework looks like that is inclusive of Aboriginal standpoints to plan learning. A framework to progress 'collaborative excellence' aspirations and diverse knowledge creation practices represents the final step in Engström's research cycle about 'examining the data and implementation'. In this study it is about realising a framework to progress collaborative design in interdisciplinary planning contexts.

Over the past decade the newSACE (2008-2012) provided pathways towards an interdisciplinary cultural shift in the ways teachers plan learning. The 'Interdisciplinary suite' of subjects and the 'Integrated Program' option have contributed to a shift in thinking, planning and learning from disciplinary to interdisciplinary planning preferences.

As discussed in Chapter 8, Section seven, how teachers relate to one another and how they plan interdisciplinary programs reflect definitions Yunkaporta (2007, n. p.) uses to describe Aboriginal knowledge creation practices identified in each Case Study. When reflected upon the definitions encourage a shift to collaborative ways of 'knowing, doing and being' teacher (Martin et al, 2003).

The narratives gifted have been included in the development of a 'Collaborative Design Framework' using the headings new 'doings', 'new sayings', new 'relatings' and 'new imagery'. Teacher engagement with such a framework is an attempt to inform collaborative planning efforts to challenge existing teacher practice architectures, in relation to planning learning.

The Collaborative Design framework below includes knowledge shared by teachers in the case study sites and by Aboriginal Leaders and Aboriginal women who participated in reclaiming values and knowledge creation workshops. Narratives applied in the framework are inclusive of Aboriginal voice and understandings. The framework is a representation too of outcomes from this study and aims to challenge and inform teachers about opportunities for future engagement in 'collaborative design' practice. See Figure 8 below.



**FIGURE 8: A COLLABORATIVE DESIGN FRAMEWORK**

**'COLLABORATIVE DESIGN 'FRAMEWORK**

(To support teacher discourse about interdisciplinary design practices)

This framework includes examples of 'new relatings, new doings and sayings' and new imagery to support interdisciplinary and collaborative planning practice.

**RESPECT RECIPROCITY RESPONSIBILITIES**

new **RELATINGS**

**Aboriginal perspectives**

- *Knowledge 'is a changing force that is constantly evolving'.*
- *Interdisciplinary planning seeks pluralist perspectives and draws upon nature-based concepts and metaphors for understanding.*
- *Planning learning is always about yarning, constructing, deconstructing, reconstructing knowledge. "It's like weaving and seeing the connections that weren't there before".*
- *Planning learning practices are about sharing knowledge to create, re-new and preserve knowledge for the next generation and for innovative purposes.*

new **'DOINGS'**

- *Paying attention to the details of teacher professionalism. (Teacher knowledge, collective autonomy, collaborative excellence.*
- *Recognition of teacher as knowledge builders / creators and making visible interdisciplinary thinking, planning and teaching expertise.*
- *Knowledge sharing across the disciplines and a 'bias to say 'yes' to teachers 'gut feelings for what may work' "There are no, NO's, when designing collaboratively".*
- *Leadership preparedness to problem solve around a schools' decision to engage in interdisciplinary thinking, planning & learning.*

**DOMAINS OF TEACHER PROFESSIONALISM**

*Teacher knowledge, teacher collective autonomy and …*
*'teacher capacity to collaborate very effectively' (Index of teacher professionalism)*
(OECD, Schleicher, 2016) *and (Salonen & Savander-Ranne, 2015)*

new **'SAYINGS'**

**Domain 1: Teacher Knowledge:**

- *Teacher as designer of learning and creator of knowledge. 'It's about the teacher having that level involvement in designing learning and developing that sense of collective ownership'*

**Domain 2: Teacher Autonomy:**

- *Teacher autonomy is dependent on trust and respect conferred by leadership teams. 'Leadership trust us to develop curriculum that's appropriate and engaging'.*
- *'Time for planning is significant and you never get too busy to talk to colleagues'.*

**Domain 3: Teacher collaboration:** *'Interdisciplinarity provides everything': collective excellence opportunities, collective ownership of curriculum, collective autonomy.*

- *Interdisciplinarity thinking and planning helps dissipate hierarchies of knowledge and promotes an equitable distribution of power and resources in schooling.*

**new IMAGERY**

- *Freedom: Collaborative Design is like teachers who have been screaming to get out of a box, finally getting out.*
- *Rollercoaster ride. It dips, it's exciting! You have to re-think some ideas, but that's fantastic!*
- *Beehive:. You've got your own role, but you visit everyone else see and hear what's going on!*
- *It's a synergy: a massive concept and when it's going really well there's synergy there.*
- *Something organic: a living thing; dynamic, evolving, sometimes sprouts new tendrils..*
- *It's like combining food on a plate to eat: You don't have vegetables, then meat, everything is mixed together and that's where the goodness is, where interesting things happen!*
- *Football: "A team playing the same game. Everybody's got a particular skill set that helps the team win…."*

The framework is about collective identity resolutions framed by the domains of teacher professionalism and surrounded by capacity building considerations such as ‘values’, new ‘doings’, ‘sayings’, ‘relatings’ and ‘imagery’ that ultimately determine teacher capacity to collaborate. The framework can serve as an awareness-raising tool for policy makers who demand collaborative actions (as outlined in the Australian Teacher Standards), but who often fail to cater for the impact of collaborative policy expectations on teacher professional practices.

Survival and protection objectives as observed in Aboriginal value contexts are particularly relevant in any reform context because teachers need to draw strength from one another’s shared experiences. The values of respect, reciprocity and responsibility are particularly relevant in reform and in collaborative contexts and in this study are fashioned from the National Health and Medical Research Council Guidelines (NHMRC, 2003) of particular relevance to Aboriginal people.

In collaborative design contexts, respect for human dignity and worth is fundamental to a functioning and caring education sector where respectful relationships induce trust and co-operation. Being reciprocal in collaborative design contexts too is about understanding the significance of ‘mutual obligation’ and equitable stakeholder responsibilities and involvement in decision-making. The recognition of core responsibilities, that include caring for others and the maintenance of harmony and balance within and between stakeholders and avoiding adverse impacts on others’ abilities to comply with their responsibilities, is also a value for consideration in contexts requiring collective identity resolutions.

## LOOKING FORWARD

### Follow up research to substantiate specific findings

A larger scale study is needed that pays attention to the finer details of collaborative practice in schools and to the less obvious ‘capacity building’ strategies such as ‘listening and hearing’, especially in light of research by Gonzalez (2014) who notes that, when collaboration work intensifies, new responsibilities emerge, placing increasing responsibilities on teachers, often without consideration for the changing nature of teacher work. Collaborative and networking responsibilities will continue to



emerge and schools may increasingly be understood as networks rather than organisations. More research is required therefore to identify schools where the ‘*collective, systematic production of new knowledge is the norm’* (Paavola et al, 2005, in Chen and Hong, 2016, p.267). This research adds to research about teacher as creator of knowledge and schools as knowledge creating organisations and networks of the future.

Follow up research could also focus on teachers learning from each other’s accumulative knowledge. Schleicher suggests that there is little empirical evidence that learning from each other’s accumulative knowledge, as a form of knowledge building, is associated with better performance and more innovation (2012, p.45). Teacher claims in this study suggest to the contrary, that collaborative design work in the case study schools positions teachers not only to learn from each other’s accumulative knowledge but also ensures they develop the capacity to collaborate and innovate and develop new ways of working with and creating curriculum knowledge. A comparative study about programs and school cultures created in interdisciplinary design contexts and those created individually in disciplinary contexts would help substantiate the claims made in this study. Once again, an additional focus on the claims teachers make about the key elements of professionalism would provide data about teachers learning from each other’s accumulative knowledge.

More research is needed about teacher planning preferences, as well as teacher capacity to share knowledge, work autonomously and network. Research about organisational and structural changes required to work in more collaborative and networked ways is also required, not least because South Australia introduced the ‘Interdisciplinary suite’ of subjects in 2008-2012 in the senior years of schooling and because of the ongoing strategic focus on STEM education nationally and internationally. Teacher interest in interdisciplinary and collaborative education resolutions, ignited by STEM and SACE reforms, has far preceded policy development needed to sustain such practices into the future.

**Limits of the Methodology**

The case study methodology, through the use of Engeström's Cycle of Expansive Learning resulted in a journey not just to explore the boundaries of collaborative design practice in schools, but beyond the boundaries to explore school organisation and curriculum design resolutions. This included modelling different visions that involved co-designing and co-facilitating workshops to 'reclaim' Aboriginal values and knowledge creation practices. In this research scenario, it was about 'doing' by engaging in reclaiming workshops with Aboriginal women to realise a symbolic framework to progress collaborative design in planning learning contexts. The modelling of a different planning vision took me in one direction but the cycle brought me back to the intent of the study to discover what was most true about collaborative design practice that hadn't been considered. The model remains an opportunity for future research.

A further limitation of this study was that given the significant time demands on teachers in the senior years, it was impossible to harness teachers as co-researchers for the project, even though they gave generously of their time for the interviews, survey and focus groups. Nor was it within the scope of this study to consider the effects of collaborative planning on student achievement. Further research with teachers as researchers, and the participation of students could elaborate on such issues.

**Significance of the study**

The study directly addresses collaborative curriculum planning practices and illustrates practices undertaken by schools and teachers. In the process it identifies gaps in opportunities, professionally, for teachers to engage in collaborative design in schooling.

Collaborative planning is described across six diverse school sites, with links to policy framing and support structures, and a centring of Aboriginal perspectives about knowledge creation and shared planning processes. The study, in pulling together a framework for collaborative planning for Integrated Programs, based on successful practice in schools, provides a basis for extensive follow-up research.



This study builds on the work of Salonen and Savander-Ranne (2015, p8) who talk about the 'core capacity of teachers to collaborate very effectively'. This statement has guided some of the study's key arguments and highlights the need for teacher capacity building to be managed purposefully so as not to exploit teacher capacity to collaborate, in particular. Current policy framing related to collaboration, including in relation to the Australian Teacher Standards, is understood in terms of teacher compliance to collaborate and is used in the main for accountability purposes. Collaboration in education contexts is too often used in policy as a means of control rather than for creative purposes and it is often framed in policy without provision for how collaboration can be organised and implemented in school settings.

This study contributes to research about collaborative design and what researchers and Aboriginal researchers in particular, have referred to as the 'third' space. A space, that seeks understanding and mutual respect (USQ, Open Desk, n. p) that advances professionalism and a sense of collective efficacy and 'collective excellence' that complements research by Eels (2011), Donohoo (2017) and Hattie (2015).

This study complements the work of Kemmis (2009a, b) and adds a further dimension, 'imagery' to complement an existing focus on teacher practice architecture that include teacher 'sayings', 'relatings' and 'doings'. Collaborative design in the case study schools necessitates the development of 'new knowledge, new relatings, sayings and doings' and 'new imagery' to challenges teacher 'practice. So in addition to scholarly contributions, the study speaks to a range of education stakeholders including those involved in policy development, education leadership and the SACE Board in suggesting options for considering data gathering and guidelines that would better support Integrated programming and teacher collaboration.

Finally, in making visible the work of teachers and school leaders in developing and sustaining Integrated Programs collaboratively, school-level educators can learn from one another's practical experiences, about how their work is framed and discussed, and find new ways of supporting professional practice. The challenge that remains for education systems and educators is even though there is convincing evidence of teacher collaboration to design learning (in this study) 'there is limited evidence of

privileging this evidence, or learning from it, or scaling it up' and ensuring others move to collective excellence objectives or collaborative and networked resolutions (Hattie, 2015, p. 27).

**Concluding Comment**

Even though teachers are mostly unaware of planning with links to Aboriginal key values and Aboriginal knowledge creation practices, the simple act of collaborating to design learning, including in the 'third' space (See Appendix #7), is apparent in collaborative design contexts in each of the key case study sites.

This study has provided evidence about teacher resolve to seek future collaborative design opportunities that include interdisciplinary knowledge and planning know – how and the reclaiming of professional practices that build stronger collective professional identities (See 'Summary Interview Survey' (Chapter 8, p.221). The evidence speaks to us about paying attention to teacher 'knowing, doing and valuing' (Martin et al, 2013) related to being connected and collaborative and like all forms of professionalism, teachers require 'collective identity resolutions' so they can draw strength from one another's shared experiences.

Sennett and Nussbaum believe 'society should enlarge and enrich people's capabilities, most of all their capacity to collaborate; modern society instead diminishes it' (2012, p.192) as do schooling contexts where teachers are often more dependent on the objects of education created somewhere else, than on one another as knowledge collaborators and creators

An early career teacher agrees and talks about designing learning collaboratively as rewarding

> *because it respects the status of education as something important and that it is some kind of professional pursuit to be doing these things which are more complex than just, well here's your subject; your sequence, go and teach. So, I think it's a really important part of our ... professionalism.*



# REFERENCES


ACARA, Australian Curriculum and Reporting Authority, (authoritative source of advice on, and delivery of, national curriculum, assessment and reporting) https://www.acara.edu.au/

Andreotti V (2007). Critical Literacy: Theories and Practices in Development Education. In S. McCloskey, (Ed.), *Development Education in Policy and Practice.* New York: Palgrave McMillan.

Andreotti V (2011). Actionable postcolonial theory in education. New York, NY: Palgrave Macmillan.

Andreotti V (2014). Conflicting epistemic demands in poststructuralist and postcolonial engagements with questions of complicity in systemic harm. Educational *Studies: A Journal of the American Educational Studies Association*, *50*(4), 378-397.

Andreotti, V. & Pashby K (2013). 'Digital democracy and global citizenship education: Mutually compatible or mutually complicit? The Educational Forum, 77(4), 422-437.

Australian Curriculum Assessment and Reporting Authority (ACARA) (2008), *Australian Curriculum* (2008 – 2016). https://www.acara.edu.au/curriculum (Downloaded May 2017)

Australian Institute for Teaching and School Leadership (AITSL), (2011). (Downloaded April 2018)

Australian Institute for Teaching and School Leadership (AITSL) (2012). The Australian Charter for the Professional Learning of Teachers and School Leaders. (Downloaded 15th September, 2017).

Australian Institute for Teaching and School Leadership (AITSL) (2014). Case Studies of student engagement. 12, (6) Website no longer available.

Bandura A (1997). Self-Efficacy: The exercise of control. New York: W.H. Freeman and Company

Benneworth P., Amanatidou E., Schachter M. & Gulbrandsen M (2014). Social innovation futures: Beyond policy panacea and conceptual ambiguity. *Working Papers on Innovation Studies.* http://www.sv.uio.no/tik/InnoWP/tik_working_paper_20150127.pdf

Bentley T. & Cazaly C (2015). The Shared Work of Learning: Lifting educational achievement through collaboration. Mitchell Institute, Victoria University: *Research Report No.03*/2015.

Bereiter, C. & Scardamalia, M (2014). Knowledge building and knowledge creation: One concept, two hills to climb. In Tan S., So H., Yeo J., (Eds.). *Knowledge creation in education,* (p 35-52). Singapore: Springer.

Big Picture Education Australia (BPEA) https://www.bigpicture.org.au/ Accessed May 2020.

Bissaker K (2014). Transforming STEM Education in an Innovative Australian School: The Role of Teachers and Academics' Professional Partnerships. *Theory into Practice, 53,* (1), 55-63, DOI: 10.1080/00405841.2014.862124

Bourke T., Lidstone J. & Ryan M (2013). Teachers Performing Professionalism: A Foucauldian Archaeology. Sage Open. October - December 2013: 1–14.

Brennan M (1996). Multiple professionalisms for Australian teachers in the information age in Simola H. & T Popkewitz (eds) Teacher Professionalization. Helsinki: University of Helsinki Research Report 169. p 200-231.

Brennan M. & Sachs, J (1998). *Integrated Curriculum, Extending Reform in the Middle Years of Schooling: Challenges and Responses.* Deakin West: Australian Curriculum Studies Association.

Brennan M. & Zipin L (2018). Transforming the Curriculum Frame, in S. Gannon, R. Hattam, W., Sawyer (Eds.) Resisting Educational Inequality: Reframing Policy and Practice in Schools Serving Vulnerable Communities. New York, NY: Routledge.

Brennan M., Ramsay E., Mackinnon A. & Hodgetts K (2009). Part time schooling. In K. Riele (Ed.), *Making schools Different: Alternative Approaches to Educating Young People*. London: Sage.

Brown A (1994). The advancement of learning, *Education Researcher*, 23(8), 4-12.

Bussey K (2009). Case Study 4, Integrated Programs**.** Website no longer available.

Chen B., Hong, H (2016). Schools as Knowledge-Building Organizations: Thirty Years of Design Research, *Educational Psychologist, 51*(2), 266-288.



Chettiparamb A (2007). Interdisciplinarity: A literature Review. Southampton: Interdisciplinary Teaching and Learning Group, Subject Centre for Languages, Linguistics and Area Studies, School of Humanities, University of Southampton

Chua J (2009). Saving the teacher's Soul: Exorcising the terrors of performativity. London Review of Education, 7, 159-167.

Cole P (2012). Linking effective professional learning with effective teaching practice, PTR Consulting.

Crafter G., Crook P. & Reid A (2006). SACE Review. (http://www.saasso.asn.au/wpcontent/uploads/2012/10 SACE_Review_full.pdf).

Davis J M (2013). Supporting creativity, inclusion and collaborative multi-professional learning. *Improving Schools*, *16*(1), 5–20.

Davis J. M., Aruldoss, V., McNair L. & Bizas, N (2013). Enabling creativity in learning environments: Lessons from the CREANOVA project. *Learning Landscapes, 6*(1), 181–202.

Department of Education and Child Development (DECD) (2011). *Job and Person Specification, Secondary Australian Curriculum Implementation Officer*. Adelaide.

Department of Education and Child Development (DECD) (2010). *Teaching for Effective Learning (TfEL).*

Department of Education and Child Development (DECD) (2016) *STEM Learning, Strategy for DECD, Preschool to year 12, 2017-2020*.

Donohoo J (2016). *Fostering Collective Teacher Efficacy: Three Enabling Conditions*. Corwin-Connect, July 13, 2016.

Donohoo J (2017). Collective Teacher Efficacy: The Effect Size Research and Six Enabling Conditions) *The Learning Exchange* (Blog).

Donohoo J., Hattie J., Eells R (2018). Collective Efficacy: When teams of educators believe they can make a difference exciting things can happen in a school. *Educational Leadership*, March 2018.

Drake S.M., Reid J (2010). Integrated Curriculum: Increasing relevance while maintaining accountability. *What Works? Research into Practice*. (Research Monograph 28), Brock University (Downloaded 20th April 2017).

Durmus S (2015). Teaching/Learning Strategies through Art: Philosophy and Basic Design Education*, Procedia - Social and Behavioural Sciences*, 182, 29 – 36.

Eells R.J (2011). Meta-Analysis of the Relationship Between Collective Teacher Efficacy and Student Achievement. Dissertations Paper, 133.

Elmore F (2006). 'Leadership as the Practice of Improvement' *International perspectives on School Leadership for Systemic Improvement*. OECD Activity Improving School Leadership (Conference)

Engeström Y (2000). Activity theory as a framework for analysing and redesigning work. *Ergonomics*, 43(7), 960-974.

Evans L., (2015). 'Professionalism and professional development: what these research fields look like today – and what tomorrow should bring'. Hillary Place Papers, 2nd edition (Jan 2015). School of Education, University of Leeds.

Fadel, Bialik, Trilling (2015). *Four - Dimensional Education. The competencies learners need to succeed.* Centre for Curriculum Redesign.

Fielding M., Bragg S., Cunningham I., Eraut M., Gilliinson S., Horne M., Robinson C. & Thorp J (2005). 'Factors Influencing the transfer of Good Practice', University of Sussex, *Research Report No RR615.*

Fleming J 2018. *International Journal of Work-Integrated learning.* Special Issue, 'Work-integrated learning research methodologies and methods, 19(3), 311-320

Foucault M (1972). *The Archaeology of Knowledge* (A. M. Sheridan Smith, Trans). London, England: Tavistock.

Fraser A (2012). 'Third Space', YouTube. https://www.youtube.com/watch?v=dpk_dssZXqs

Freeth W. & Andreotti V (2012). *Towards reconceptualising the implications of the Revised New Zealand Curriculum for School Leaders: Case study*. Wellington, NZ. Teaching and Learning Research Initiative.

Freidson E (1994). *Professionalism Reborn; Theory, Prophecy and Policy*, Wiley ISBN 0745614469, 9780745614465

Fullan M (1993). *Change Forces: Probing the Depths of Educational Reform*. London: Falmer Press.



Fullan M., Rincon-Gallardo S. & Hargreaves A (2015). *Professional capital as Accountability*. Education Policy Analysis Archives 23 (15). Special Series on A New Paradigm for Educational Accountability: Accountability for Professional Practice.

Geertz C (1973). *Thick Description: Towards an Interpretive Theory of Culture*. New York: Basic Books.

Gilbert R (2011). *The Professional Learning Flagship Program: Leading Curriculum Change*. Melbourne: AITSL (Australian Institute for Teaching and School Leadership).

Gilbert, R (2012). *Curriculum Planning in a Context of Change: A Literature Review for the Department of Education and Early Childhood Development*, Victoria. August 2012.

Global Network for Dynamic Research and Publishing, *'Within, Between, Beyond'.*

https://www.inter-disciplinary.net/research/interdisciplinarity/withinbetweenbeyond/

Gonzales N., (2014). *Educators as designers: New systems to scale deep learning. Centre for Strategic Education* Seminar Series Paper No. 236, July 2014. East Melbourne, Victoria 3002. www.cse.edu.au

Groundwater-Smith S., Brennan M., McFadden M., Mitchell A. & Munns M., (2009) *Secondary Schooling in a Changing World*, *South Melbourne, Cengage Learning.*

Groundwater-Smith S. & Mockler N (2009). *Teacher Professional Learning in an Age of Compliance.* Springer.

Gruenert S (2005). Correlations of Collaborative School Cultures with Student Achievement. *NASSP Bulletin, 89*(645), 43-55

Hanushek E.A., Link S. & Woessmann L (2013). Does school autonomy make sense everywhere? Panel estimates from PISA

Hargreaves A., (2000). Four Ages of Professionalism and Professional Learning;, *Teachers and Teaching.* 6:2, 151-182, DOI:101080/713698714 (Downloaded 27th April, 2020)

Hargreaves A., (1994). *Changing Teachers, Changing Times: Teachers' Work and Culture in the Postmodern Age*. London: Cassell.

Hargreaves A. & Dawe R (1990). Paths of Professional Development: Contrived collegiality, collaborative culture, and the case of peer coaching. *Teaching and Teacher Education, 6(*3), 227-241. http://dx.doi.org/10.1016/0742-051X(90)90015-W.

Harpaz Y. (2005). Teaching and learning in a community of thinking. *Journal of Curriculum and Supervision*, 20(2), 136-157

Harvie (2014). Pillars and Lintels: The What's, Why's and How's of Interdisciplinary Learning in STEM Education. *EMEC Papers /Pillars and Lintels* Mar 26, 2014. (Downloaded 21st June 2017).

Hattie J., (2003) Building Teacher Quality. 'What does the Research tell us' *Teachers make a Difference. What is the Research Evidence?* Australian Council Education Research (ACER)

Hattie J., (2015). *What Works best in Education: The Politics of Collaborative Expertise.* Pearson.

Hulme D. & Toye J., (2006) The Case for Cross-Disciplinary Social Science Research on Poverty, Inequality and Well-being. Bridging the Disciplines. The Journal of Development Studies, 42 (7).

Hyde, S. (2015). Australian Science Maths School (ASMS). *OPINION: The role of open –learning – environments.*

Johnston J., (2015) 'Issues of Professionalism and teachers: critical observations from research and the literature', *Australian Educational Researcher*, vol. 42, no. 3, pp. 299-317

Kania J. & Kramer M., (2013) Embracing Emergence: How Collective Impact Addresses Complexity. *Stanford Innovation Review*. Downloaded 4th April 2017.

Kelchtermans G.,(2006) Teacher collaboration and collegiality as workplace conditions. A review. *Zeitschrift für Pädagogik, 52*, 220-237.

Kemmis S., (2009a) In Bill Green (Ed.), *Understanding and Researching Professional Practice: A Synoptic Framework*. Rotterdam: Sense Publishers.

Kemmis S., (2009b) Action research as a practice-based practice. *Educational Action Research*, 17(3), 463-474.



Killion J., (2012) AITSL: *The Essential Guide to Professional Learning*. aitsl.edu.au/docs/default-source/default-document-library/the-essential-guide-to-professional-learning---collaboration2dc5ac91b1e86477b58fff00006709da.pdf?sfvrsn=86a2ec3c_2

Klaassen R., (2018) Interdisciplinary education: A case study. *European Journal of Engineering Education, 43*(6), 842–859. Downloaded 19th October 2018.

Klein J., (1990) *Interdisciplinarity: History, Theory and Practice*. Detroit: Wayne State University Press.

Klein, J., (2000) A Conceptual Vocabulary of Interdisciplinary Science. In P. Weingart & N. Stehr (Eds.), *Practising Interdisciplinarity*. London: University of Toronto Press, 3-24.

Klein J., (2006). A platform for a shared discourse of interdisciplinary education. *Journal of Social Science Education*, *5*(2),10-18.

Klein J., & Newell, W. (1998). Advancing Interdisciplinary Studies. In Newell, W.H. (ed.) *Interdisciplinarity: Essays from the Literature.* New York: The College Boards, 393-415.

Kolko J. (2010). Abductive Thinking and Sense making: The Drivers of Design Synthesis. *Massachusetts Institute of Technology: Design Issues, 26*(1). Downloaded 22nd Oct. 2018.

Learning Frontiers, 2013, Professional Practices to increase student engagement in learning. Issue 1. '*Insights and Ideas'*. http://adellearnfront.weebly.com/uploads/6/3/0/9/63091463/issue_1.pdf

Leavy B., (2012) Collaborative innovation as the new imperative – design thinking, value co-creation and the power of pull. *Strategy & Leadership, 40(*2), 25 – 34.

Levin B. & Fullan M., (2008) 'Learning about System Renewal', *Educational Management Administration & Leadership* 36 (2) p 289-303, SAGE Publications. Downloaded 16th April 2020.

Lingard B., (2011) Changing Teachers' Work in Australia. In Mocker N. & Sachs J., (Eds.) *Rethinking Educational Practice through Reflexive Inquiry*, Professional Development in Schools and Higher Education. 7DOI 1 10.1007/978-94-007-0805-1-16. Springer Science and Business Media.

Long J., Moran W. & Harris J. (2010) Following the Yellow Brick Road: Interdisciplinary Practices in the Land of Oz. *Issues in Integrative Studies*, 28.

Loughland T. & Nguyen H., (2020) Using teacher collective efficacy as a conceptual framework for teacher professional learning – A case study. *Australian Journal of Education* 0(0) 1–14, online first.

Lowrie T. (2017) *STEM Education for all young Australians*. Commissioned by Social Ventures Australia in partnership with Samsung Electronics Australia.

Lloyd M. & Mayer D., (2010) (unpublished). *Review of AITSL Draft Standards for Professional Learning Programs*. Australian Institute for Teaching and School Leadership. Brisbane.

Martin K. & Booran M (2003) 'Ways of knowing, being and doing: A theoretical framework and methods for indigenous and indigenist re-search', *Journal of Australian Studies*, 27:76, 203-214, DOI: 10.1080/14443050309387838

Mausethagen S. & Mølstad, C., (2015). Shifts in curriculum control: Contesting ideas of Teacher Autonomy. *Nordic Journal of Studies in Educational Policy*, 1, 28520 - http://dx.doi.org/10.3402/nstep.v1.28520. Oslo: Centre for the Study of Professions.

Miles M. & Huberman, M (1994), '*Qualitative data analysis. An expanded sourcebook'*. Thousand Oaks: Sage.

Mockler N. (2018) Curriculum Integration in the 21st Century: Some reflections in the light of the Australian Curriculum. *Curriculum Perspectives*, available online at https://link.springer.com/article/10.1007/s41297-018-0047-9

Moen A., Anders I. & Paavola S. (2012), Collaborative Knowledge Creation, Practices, Tools, Concepts. *Technology Enhanced Learning, 7.*

Murray T., (2009), What is the Integral in Integral Education? From Progressive Pedagogy to Integral Pedagogy. *Integral Review*, 5(1).

Nakashima D., Prott, L., Bridgewater P (2000), Tapping into the world's wisdom - UNESCO Digital Library. *UNESCO sources, 125*, 11-12. https://unesdoc.unesco.org/ark:/48223/pf0000120208

Nakata M (2001), *Changing Indigenous Perspectives in Curriculum Areas*. Cairns: Paper presented at Aboriginal and Torres Strait Islander Education Symposium.



Nakata M. (2007). The Cultural Interface', *Australian Journal of Indigenous Education*, *36,* Supplement 1, (p.7-14.)

Nakata, M (2007a). *Disciplining the Savages - Savaging the disciplines*. Canberra: Aboriginal Studies Press.

NHMRC: (National Health and Medical Research Council) (2018) *Ethical conduct in research with Aboriginal and Torres Strait Islander Peoples and Communities: Guidelines for researchers and stakeholders* (2018), Commonwealth of Australia: Canberra.

Organisation for Economic Cooperation and Development (OECD) (2010) *Finland: Slow and Steady Reform for Consistently High Results*. Report. Paris: OECD Publishing. Downloaded 18th April, 2017.

Organisation for Economic Cooperation and Development (OECD) (2011), *Innovative Learning Environment Project*. South Australian Academy of Middle Schooling.

Organisation for Economic Cooperation and Development (OECD), (2012). *Delivering School Transparency in Australia: National Reporting through My School*. Paris: OECD Publishing.

Organisation for Economic Cooperation and Development (OECD). (2014). *Measuring innovation in education: A new perspective*. Paris: OECD Publishing.

Organisation for Economic Cooperation and Development (OECD) (2015). *Education Policy Outlook 2015: Making Reforms Happen*. Paris: OECD Publishing. (Downloaded 15th September 2017)

Organisation for Economic Cooperation and Development (OECD) (2016). *Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills*. Paris: OECD Publishing. Report prepared by Van Damme, OECD Centre for Educational Research and Innovation (CERI).

OECD/CERI (2012). Innovative Learning Environments (ILE) *Project Inventory Case Study: Australian Science and Mathematics School (ASMS)* Paris: OECD Publishing.

Paavola S., Hakkarainen K. (2005). The Knowledge Creation Metaphor – An Emergent Epistemological Approach to Learning. *Science & Education*, August 2005.

Peim N (2012). The Big Other: An Offer You Can't refuse – or accept, in some cases. Education as Onto-Theological Principle (Empire) An anti-manifesto, *Other Education,* 1(1), 226-238.

Roberts A., Cantu, D (2012). Applying STEM Instructional Strategies to Design and Technology Curriculum. Technology Education in the 21st Century, Proceeding of The PATT 26 Conference. Linkoping University, Stockholm.

Roberts K., Owen S. (2012). *Innovative Education: A Review of the Literature*. Paris: OECD Publishing. Paper prepared for the Government of South Australia, Department for Education and Child Development to support innovative education research and future directions.

Ryan M., (2005) *Encyclopaedia of Social Theory* v.2, 789.

SACE Board: (South Australia Certificate Education Board) (2018) *Guidelines for the development of Local Programs and Integrated Programs*.

Sahlberg P (2011). *Finnish Lessons: What can the world learn from educational change in Finland?* New York: Teachers College Press. Accessed October 2013,

Salonen A. & Savander-Ranne C. (2015). Teachers' Shared Expertise at a Multidisciplinary University of Applied Sciences. SAGE Open. DOI: 10.1177/2158244015596206 sgo.sagepub.com

Scardamalia M (2002). Collective Cognitive Responsibility for the Advancement of Knowledge. In B. Smith (Ed.),*Liberal Education in a Knowledge Society*. Chicago: Open Court.

Scardamalia M (2003). Knowledge building environments: Extending the limits of the possible in education and knowledge work. In DiStefano, Rudestam, Silverman (Eds.), *Encyclopedia of distributed learning* (pp. 269–272). Thousand Oaks, CA: Sage.

Scardamalia M. & Bereiter C. (2002). Knowledge Building.

Scardamalia M. & Bereiter C (2007). Fostering communities of learners and knowledge building: An interrupted dialogue. In J. C. Campione, K. E. Metz, & A. S. Palinscar (Eds.) *Children's learning in the laboratory and in the classroom. Mahwah, NJ: Erlbaum.*



Schleicher A. (Ed.) (2012). Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World. Paris: OECD

Science online, May 2019. http://www.project2061.org/publications/sfaa/online/chap.12.htm (downloaded 3rd May 2019).

Schleicher A (2016). *Teaching Excellence through Professional Learning and Policy Reform: Lessons from Around the World*. International Summit on the Teaching Profession, Paris: OECD Publishing.

Sennett R (2012). *Together: The rituals, pleasures and politics of cooperation.* Harmondsworth: Penguin. Also: Sennett R (2012). Together: the rituals, pleasures and politics of cooperation. Youtube, University of California Television (UCTV) Mar 7, 2012.

Silva D (2014) Toward a Black Feminist Poethics: The quest (ion) of Blackness toward the End of the World. *The Black Scholar* 44 (2), 81-97.

Somekh B. & Lewin C (Eds) (2011). *Theory and Methods in Social Research*. London: Sage Publications.

SACE Board of South Australia (2017). *Improving Tertiary Pathways by Improving Support for Prospective Students.* https://ltr.edu.au/resources/ID15-4808_Mills_Report_2018.pdf

SASPA (South Australian Secondary Principals Association (2014). *Discussion Paper: '21st Century Learning and Teaching Paradigm.* *https://www.saspa.com.au/position-papers/*

Timperley H., Wilson A., Barrar H. & Fung I (2007), *Teacher Professional Learning and Development: Iterative Best Evidence Synthesis programme*. Wellington, New Zealand: Ministry of Education.

Tytler R (2007). Reimaging Science Education. Engaging students in science for Australia's future. Australian Council for Educational Research (ACER)

Tomelleri S., Lusardi R. & Artioli G (2015). The metaphors of collaboration, or the social construction of collaborative interactions between health professionals. *Acta Biomed for Health Professions*; 86(S.1), 7-18.

United Nations Educational, Scientific and Cultural Organisation (UNESCO), (2014). *Learning to live together. Education policies and realities in the Asia Pacific.* United States, Department Education (2015). STEM 2026.

USQ, EATSIPS, Embedding Aboriginal and Torres Strait Islander Perspectives. 'Understanding Australian Aboriginal Educational Contexts'. University of Southern Queensland (Open Desk) https://open.usq.edu.au/mod/book/view

Waldron N., McCleskey J (2010). Establishing a Collaborative School Culture through Comprehensive School Reform. *Journal of Educational and Psychological Consultation,* 20:58–74, Online DOI: 10.1080/10474410903535364.

Walker R., Jojola T. & Natcher D (Eds) (2013). Theorizing Indigenous Planning. In Walker R., Jojola T.& Natcher D (Eds.). *Reclaiming Indigenous Planning*. Montreal, QC: McGill-Queen's University Press.

Wermke W.& Salokangas M (2015). Autonomy in education: Theoretical and empirical approaches to a contested concept. *Nordic Journal of Studies in Educational Policy*. https://doi.org/10.3402/nstep.v1.28841

Yazan B (2015). Three Approaches to Case Study Methods in Education: in Yin, Merriam and Stake, *Qualitative Report*, 20(2), 134-152.

Yunkaporta T (2007). Indigenous Knowledge Systems: Comparing Aboriginal and Western Ways of Knowing. Suite 101. http://aboriginalrights.suite101.com/article.cfm/indigenous_knowledge_systems (accessed 11 June 2010) (site closed).

Yunkaporta T. https://8ways.wikispaces.com/file/view/8way+training.ppt (site closed).

Yunkaporta T (2009). *Aboriginal Pedagogies at the Cultural Interface* (PhD thesis James Cook University).



# APPENDICES

## Appendix #1: Professional Teacher Index (OECD) (Schleicher, 2016, p.37)

**Box 2.1 The TALIS index of teacher professionalism**
In constructing the three TALIS scales of professionalism, three composite, additive scales were created. These scales weigh each factor equally and create an additive scale that ranges from 0-5. The composite additive approach, which is based on tangible, observed practices, is more appropriate for teacher professionalism than other approaches, such as confirmatory factor analysis or structural equation modelling, which rely on inter-item correlations to capture a latent construct (such as, for example, job satisfaction). The sub-indices are based on reports from teachers and principals on:

**1. Knowledge-base best practices** – drawn from TALIS 2013 teacher questionnaire
• pre-service formal education _
• participation in formal teacher-education programme _
• breadth of content covered in teacher-education programme _
• support for in-service professional learning _
• types of support provided for ongoing professional development during and outside working hours (time, monetary, non-monetary) _
• participation in long-term professional development _
• support for practitioner research _
• participation in practitioner or action-research

**2. Autonomy – drawn from TALIS 2013** principal questionnaire _
• decision making over curriculum choices _
• decision making over learning materials _
• decision making over course content _
• decision making over assessment policies _
• decision making over discipline policies _

**3. Peer networks – drawn from TALIS 2013** teacher questionnaire _
• participation in a formal induction programme _
• participation in formal mentoring programme _
• received peer feedback on teaching based on direct observation _
• development of a professional development plan _
• participation in network supporting teacher professional development

## APPENDIX #2: OVERVIEW OF RECLAIMING WORKSHOPS

### Reclaiming Aboriginal Values and Knowledge Creation Practices …..

**Yarning about Indigenous Values:** (Values and Ethics Guidelines for ethical conduct Aboriginal health and research) Reciprocity *(mutual obligation)* Respect *(trust and co-operation)*, Responsibility *(recognition of core responsibilities)*, Equality *(equal value of people)* Survival and Protection *(the importance of a collective identity)*, Spirit and Integrity *(Coherence of values and cultures)*.
**Yarning about**: what's important to you and why? Rank in order of importance to you

*What do these values mean to you in your everyday life as an Aboriginal woman / Leader?* Any example/s? ie *"I'd like to reclaim 'respect' in my workplace"*
*Are these values important enough to you to want to think about a bit more or share with others* in the workplace or with community and family?.
What would / could you do? ie *List an Aboriginal value (definition) on meeting agendas.*

*Painting from the 'Ochre and Ink' exhibition. A collaboration by Johnny Bulunbulun and Zhou Xiaoping.* *https://www.diggins.com.au/exhibition/xiaoping-zhou/*

**Yarning about images**

- Collaboration / being reciprocal / being respectful / across cultures' and the 'Capacity of people to collaborate' *(given the chance)*

- ***The potential for Aboriginal 'ways** of being, doing, knowing and valuing'*, shaping and inspiring other cultures *(given the chance). Do you agree?, why/why not? or what does it mean for you?*

- ***Do you think 'collaboration' is valued more in Aboriginal cultures*** than in the Australian population? Why/why not? *Could you explain or give examples?*

- ***Yarning about Identity Maps:*** Discuss what you learnt, how you felt about identifying specific values/connections/ ways of being. knowing, valuing. *Would you share this tool?*

- **Yarning about: reclaiming Aboriginal ways of creating knowledge***: including 'Holistic' Knowledge, 'Deep Narrative', 'Communal knowledge', 'Elder Knowingness', Synergistic knowledge 'Intellectual Biomimicry'*, Circular Logic, Indigenous Pluralism (Yunkaporta, 2007).

- ***How do you learn best***: *What knowledge creation process works best for you and members of your family and what knowledge creation practice/s would you reclaim and why?*



## APPENDIX #3: QUESTIONS FOR DISCUSSION WITH TEACHERS

**Research title: Reclaiming professional practice***: Case studies of teachers collaborating to design learning in senior secondary schools.*
**Ethics approval** granted from Victoria University: May 2014 / DECD, SA, September 2014
Researchers: Professor Marie Brennan and student researcher: Helen Dolan

This research is about stories of teachers designing curriculum collaboratively as a response to South Australian Certificate Education (2008-2012) and Australian Curriculum (2012-2016) reforms. This study is interested in how teachers collaborate to design learning and the process towards reclaiming professional practice (Knowledge, Autonomy, Collaboration) as identified in the OECD Professional Teacher Index (2016).

**Experienced** (3+ yrs) or **early career teacher** (less than 3 yrs) (circle)

---

- Qualifications completed
- Describe how teachers plan learning collaboratively
- Years spent working as a team to design Integrated Programs
- Brief description/s of Integrated Programs in which you have participated.

**Professional work /Curriculum understandings**

- How did you come to be here (in this role)? And how does it differ from previous teaching roles?
- How has integrated /collaborative planning impacted on your understandings about curriculum?
- How does collaborative planning impact on teacher practice/ identity as a teacher/ school culture
- What are the implications for teachers, learners and communities?

**Collaboration planning processes**

- **Describe the process of developing an integrated program** (Ie big idea development, co-planning; exposure to different curriculum areas, co-teaching and observations; co-assessing and co- reflection; networking, mentoring, conferences, follow up) (Adapted from Owens 2014)
- **Describe the collaborative processes:** arriving at the big idea, conceptualising, co-construction, implementation, sustaining the momentum and the relationships.
- **Discuss the process of collaborating** with others in the design of curriculum.
- Has the DECD 'Learning Design' process to conceptualise curriculum encouraged collaboration?
- Was it implemented to address a particular education circumstance / student group?

**Education in the 21st century is about: Collaborative planning – individual journeys**

- Describe your journey: from a teacher of specific subjects (as an 'expert knower' perhaps) to your role as a cross- curriculum collaborator / planner of learning. (ie teacher identify issues, sharing knowledge issues; new ways of knowing, relating, thinking and being teacher issues *Comment?*
- What has been the Impact of collaborating to design learning professionally / identity as a teacher?
- Has designing learning collaboratively changed your practice? (thinking, knowledge, curriculum, planning)

**When you think about the process of (collaborative planning) and Integrated Programs created it is:**

- **a process** that offers greater creative, innovative learning options and pedagogical solutions
- a logical and realistic planning process to manage C21st knowledge perspectives?
- a complex design process to prepare students for a complex world.

**What specific initiatives / strategies have supported/changed your thinking?**

- Where do you see yourself going with this? What next for your practice?
- What has it felt like to be immersed in collaborative design practices? Has it shifted your thinking?

## APPENDIX #4: POST INTERVIEW SUMMARY SURVEY

**Research title:** *Reclaiming professional practices: case studies of teach collaboration to design learning in the senior years of schooling*

***So what's it (collaborative planning) been like?*** **–** Do any metaphors / images come to mind?

**Select statements that connect with your experience (circle)**

**What personal dispositions do you need** to be able to engage in collaborative design processes' (Survey adapted from CREANOVA Project). Davis, J.M.,Aruldoss, V., McNair L., Bizas, N. (2013).

**Read the following list of dispositions and circle**

a) Ability to embrace doing something different, collaboratively, across the disciplines
b) Appreciation of diversity and tolerance and respectful and trusting working relationships
c) Emotional skills to work collaboratively – inter-relationship sensitivity, generosity, compassion and recognition of others strengths
d) Dispositions to engage in risk taking, cope with ambiguity, engage freely in dialogue, pose questions freely and to work in a more playful environment
e) Ability to learn from different cultural perspectives
f) Ability to Imagine the possibilities and to hear and experience the imaginations of others
g) To connect the task and the thinking to your own interests and knowledge and possibilities.

**What are the most significant reasons for school / staff to commit to collaborative design work?**

a) Economics of Integration outcomes / issues. (Staffing, timetabling)
b) As a realistic response to systemic curriculum renewal options (SACE /AC)
c) An opportunity to engage in 21st century conceptualisations of curriculum / knowledge to create programs of learning of relevance for students.
d) A chance to work in multidisciplinary teams that reflect 21st workplace practices?
e) Engagement in innovative curriculum work that is valued and highlights the role and identity of teacher as "a designer of learning and a knowledge producer" who has a central role to play in curriculum development.
f) As a way of broadening teacher knowledge about what education is and what curriculum can be to address challenging education contexts: ie behavioural, multicultural and learning issues.
g) A belief / understanding / that Integrated Programs ('packages of learning linked to 'big ideas' across subjects') help students connect learning across the disciplines to develop authentic knowledge, skills and capabilities for the 21st century.



h) **What is required of school cultures to successfully support collaborative curriculum design work?**

(Questions based on CREANOVA Project, Davis 2014)

a) School leadership that values teachers working together in creative, innovative ways that are designed around **intrinsic rewards** such as working towards the 'common good'.
b) A focus on '**Capacity Building'**: *Any strategy that increases the collective effectiveness of a group to lead curriculum innovation /reform (Levine and Fullen in* Gilbert, 2011, p.6).
c) Promotion of a school culture that facilitates the 'collective ownership' of 'collaborative planning'
d) Individual and structural factors that enable collaborative design for learning and collective reflexivity (organisational structures, appropriate design of work spaces)
e) A culture that enables teachers to put into practice their ideas, learning and knowledge.
f) Forums that stimulate collective reflexivity for teachers to analyse their perspectives on the same 'big issue'.
g) Commitment to solving teacher work related issues.

### Final thoughts

a) *Was / is the process of designing learning collaboratively a 'learning experience that generated some excitement and was a rewarding experience in itself?* Yes / No / not really
b) *Was / is the experience transformative? – Has it enabled you as a teacher to think differently /*
c) *teach differently / use diverse pedagogical solutions?* Yes / No / Not really
d) *Collaborative design practices have impacted on your identity as a teacher … how you think about*
e) *your work as teacher?* Yes / No / not really
f) *Does / has the experience helped redefine the process of designing learning as a more collaborative*
g) *pursuit rather than an individualistic pursuit?* Yes / No / not really
h) *In the future will you seek out work opportunities for future collaborative design work including the development of integrated programs?* Yes / No / Maybe

**Please comment:**

- *"When learning moves beyond disciplinary boundaries it is possible for participants to become engrossed to the extent that learners take intense ownership of the learning process and engage in a process that has been termed **'flow'** that enables teachers to share personal stories concerning their hopes and fears and enables a diversity of behaviours and outcomes to occur"* (Davis 2013b) Any comment!!
- Comment on the significance of the **'collective ownership of curriculum'** from a professional and personal perspective and from a school / district or system perspective.

## APPENDIX #5: BUILDING TEACHER CAPACITY IN THE CASE STUDY SITE (HEADINGS ADAPTED FROM DONOHOO 2017).

**Advancing teacher influence, Responsiveness of Leadership, Goal Consensus Teacher knowledge about one-anothers' work, Cohesive staff**

***Advancing teacher influence***

- *School commitment to teacher professionalism (knowledge, autonomy, collaboration)*
- *Building capacity through ongoing collaborative discourse.*
- *Aboriginal knowledge creation perspectives and narratives in mainstream planning*
- *Teacher observation of the gaps in student learning to actively seek curriculum resolutions.*
- *Opportunities for teachers to work with knowledge and initiate curriculum resolutions*
- *Routine networking to develop teacher capacities to collaborate and less insular attitudes.*

***Goal Consensus***

- *Collaborating to design learning demands listening, communication, sharing knowledge, negotiation and consensus at all stages of the collaborative design process.*

***Teacher knowledge about one another's work**: and 'gut feelings for what works'.*

- *Teacher time to fully understand the curriculum; time to imagine opportunities within it; and time to be creative about how that's going to be planned and implemented together.*

***Cohesive staff:***

- *Articulation of key concepts, (ie collaboration) and essential protocols, locally.*
- *Staff consensus about site visions, (ie student engagement, well-being) .*
- *Promotion of professional practices and a contributive leadership culture,*
- *Evolving and devolving leadership roles that include making time for interdisciplinary thinking, planning, collaborative decision making and reaching consensus in design teams.*

***Responsiveness of Leadership***

- *Leadership preparedness to problem solve around decisions made*
- *Paying attention to the details' of decisions made.*

## Appendix 6 #:Synthesising curriculum knowledge

**Three Methods of formalising the synthesis process in Integrated practice**
('reframing', 'concept mapping', and 'insight combination')

Kolko, (2010). Abductive Thinking and Sensemaking: The Drivers of Design Synthesis. *Massachusetts Institute of Technology: Design Issues, 26*(1).

Design is always about synthesis and organising complexity and design synthesis ai an 'abductive sense making process of manipulating, organising, pruning, and filtering data in the context of a design problem, in an effort to produce information and knowledge' (Kolko, 2010, p.27).

**Reframing:** *reframing is a method of shifting semantic perspective in order to see things in a new way*. During synthesis, a designer can utilize a reframing method to explicitly shift frames, changing the selected features and relationships and actively producing new design implications and constraints (Kolko, 2010, p.23).

**Concept mapping:** The concept map represents the creators' mental model of a concept and informs and shapes that mental model during creation to allow designers to see both the holistic scale of the concept and also critical details within the concept. As it affords action-based understanding at both a gross and fine level, both its creation and its usage become tools for sensemaking (Kolko, 2010, p.24).

**Insight combination:** is a method of building on established design patterns in order to create initial design ideas. Through multiple steps, this method first demands the articulation of individual design insights, and then forces a structured and formal pairing of insights with existing patterns (Kolko, 2010, p.26).

APPENDIX #7

**UNDERSTANDING AUSTRALIAN ABORIGINAL EDUCATIONAL CONTEXTS**

UNIVERSITY SOUTHERN QUEENSLAND (USQ OPENDESK)
https://open.usq.edu.au/mod/book/view

EATSIPS, (Embedding Aboriginal and Torres Strait Islander Perspectives)

## THE CULTURAL INTERFACE

4. Creating the Third Cultural Space

The Third Cultural Space, as explained in the *Embedding Aboriginal and Torres Strait Islander Perspectives in Schools: A guide for school learning communities* (2010), draws on the rich histories of Aboriginal and Torres Strait Islanders, balanced alongside Western ways. It is the 'middle ground', a new way of learning (Bhahba, 2004; Yunipingu, 1989). It acknowledges that Aboriginal and Torres Strait Islander communities have deep cultural world views that differ from those in the Western education system. The first space represents Indigenous ways of knowing, being and doing. The second represents Western ways. The third cultural space is a place of not knowing, of seeking understanding and of mutual respect.

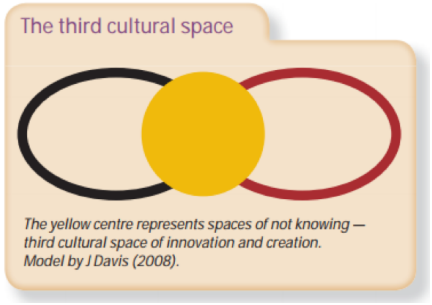



**Image Credit:** The State of Queensland, EATSIPS Framework, Indigenous Education - EATSIPS, (Embedding Aboriginal and Torres Strait Islander Perspectives)