Chapter 1
Teachers' Research Thinking

John Willison

Abstract In a world of unpredictable change, we need preservice and in-service school teachers, and university educators who can respond dynamically to students' diverse needs and the evolving demands on their lives. In this book, *research thinking* is used as an umbrella term for the raft of skills associated with such responsive teaching. Research thinking is needed so that teachers are both able to react quickly to contingencies and systematically adapt their practice through consolidation and change. The chapters of this book show how responsive research thinking in its various guises can help Preservice Teachers, In-Service Teachers, and University Educators to consolidate, change and connect through each chapter's use of the Research Skill Development (RSD) conceptual framework. This chapter outlines the need for teachers' research thinking, the nature of the RSD framework and what research thinking looks like with reference to the framework. This chapter then overviews how each chapter contributes to the book's theme of research thinking for responsive teaching before concluding with implications of the book for educational theory and practice.

1.1 Introduction

Research thinking is the term used in this book to communicate the idea of teachers engaging as mindful agents who discerningly adapt others' approaches based on research evidence as well as approaches to generate data and synthesise meaning in their own classrooms. Engaging with or consuming peer-reviewed and grey literature (such as in practice-oriented journals) requires sophisticated evaluation, translation and adaptation of concepts to each teaching context. Producing knowledge by thinking through and engaging in action research on their own classes is fundamental to teacher generation of contextually-situated information and data that enables decisions that influence student learning. This dual role as consumers and producers of research enables teachers to learn to make decisions about how to adapt to emerging

J. Willison (✉)
University of Adelaide, Adelaide, Australia
e-mail: john.willison@adelaide.edu.au

issues, sometimes responding quickly, sometimes planning proactively, and conveys this book's meaning of 'responsive teaching'. Teachers who are responsive sometimes take the time to identify and consolidate good practice, and at other times move quickly to adjust and change. Whenever consolidating or changing, responsive teachers endeavour to connect the components of learning in ways that students can join the dots.

This chapter focuses on the need for and nature of research thinking for Preservice Teachers (PSTs), In-service Teachers (I-STs) and University Educators (UEs), informed by the Research Skill Development (RSD) framework (Willison, 2018; Willison & O'Regan, 2007). Research thinking helps individual teachers consolidate good teaching practice, identify what may need to change and, crucially, make connections with colleagues. The chapter's perspective is that the shared framework and language of 'research thinking' facilitates connections with colleagues, theories and practices—within and across institutions—to improve student learning. Therefore, after introducing the RSD below and then defining research thinking with reference to it, this chapter overviews each of the other chapters, all of which use the RSD for the conceptual framing of research thinking. This overview helps to show the clear connections from PST education to I-ST education and educational development for UEs.

Research thinking embraces the cognitive, affective and relational aspects of thinking associated with the everyday interactions of the classroom as well as more systematic study, to solve problems that perplex and challenge teachers (Dewey, 1910). 'Research thinking…helps the teacher to see a problem systemically, solve the problems of non-standard character and high level of complexity.' (Rinatovna, 2017, p. 1411). Teacher research thinking is required and studied in teacher action research (McNiff, 1995), participatory action research (Kemmis, 2009), action learning (Zuber-Skerritt, 2002), evidence-based decision making (Willison et al., 2020), research-based teaching (Willcoxson et al., 2011) and the scholarship of teaching and learning (Cranton, 2011). Research thinking can also be modelled and facilitated by teachers, and so developed and used by students in problem-based learning, project-based learning, research-based learning, inquiry learning, collaborative learning, discovery learning and, frequently, in learning environments that blend face-to-face and online learning (Willison, 2020b). As an example, Chap. 2 of this book focuses on teacher research thinking, teacher real-time responses and their influence on secondary school student research skills.

This book's focus on responsive teaching has become, if possible, even more essential than it was four years ago. In addition to the usual and heavy demands on their adaptability, teachers worldwide have been responding to fast changes due to the complexities caused by COVID 19 and more recently by the easy access for students and teachers of Artificial Intelligence (see McLeod, Chap. 7 of this book). The changes demanded by COVID-19 and the acceleration of Artificial Intelligence use in educational contexts demonstrates that, at times, thoughtful responses enabled by research thinking of teachers, schools and universities are needed well before peer-reviewed research is conducted, let alone research-informed policy is formulated.

This book's focus on teacher research thinking, then, is timely because it highlights and provides a range of ways to facilitate the development of responsive teaching. Responsiveness may be needed because of sudden contingencies, because of day-to-day factors or slower evolution of circumstances. One of these evolving circumstances is that, increasingly the '…codification of knowledge or practice is privileged over the professional judgement of teachers' (Hallman et al., 2022, p. 127). Codified knowledge and practice are stripped of contextual understanding, imply rigidity over responsiveness and reduces the salience of teacher professional judgement. Furthermore, less responsive classroom practice and reduced teacher professionalism may have the opposite effect of the intended educational aims of codified practice. In our era of unpredictable change, maximising educator capacity for professional judgement and response to emerging needs is vital (De Vos et al., 2019). This is because improvement in teaching involves an ongoing quest to enhance student learning, including the identification and consolidation of existing helpful practice as well as new practice, rather than codification of practice: 'Codification is a dangerous thing when change is inevitable.' (Hallman et al., 2022, p. 127). Through teacher responsiveness throughout COVID-19 and AI's emergence as a major educational factor, perhaps more than ever education systems should be able to appreciate the need for teacher responsiveness over codification of practice.

Research thinking in this book is seen as a term that prioritises teacher professional judgement which heeds, but is not diffident with respect to, others' research. This book's vision of research thinking emphasises a balance between others' published evidence and a teacher's own evidence from practice. Mentalities around educational research seem to emphasize, on one hand a reliance on pre-specified curriculum and pedagogical approaches developed and validated through others' research or, on the other hand, teacher-research (Willison et al., 2020). We may ask of those who state that teaching must be based on evidence-based practice '*whose* evidence?'.

1.2 Research Thinking is Multifaceted

The RSD is the overarching conceptual framework for this book. The authors of Chaps. 2–8 have adapted and implemented the RSD in their practice, and then researched their practice. In the decade following the first publication outlining the RSD (Willison & O'Regan, 2007), the framework was piloted and evaluated (Willison, 2012, 2018; Willison & Buisman-Pijlman, 2016; Willison et al., 2017, 2020; Wilmore & Willison, 2016), and critiqued (e.g., Brew, 2013; Spronken-Smith et al., 2013), revitalising the framework (see Willison, 2018 for a summary of changes in response to others' critique). There was an overarching sense that the framework addressed core elements of the sophisticated thinking that students and teachers needed to engage with and in, including in teacher education (Brew & Saunders, 2020).

In the RSD, the skills associated with research are articulated in six facets, each including verbs that make the research processes explicit, an integral affective dimension (Willison et al., 2020) and key question that each facet addresses (see Willison, 2018 for detailed descriptions of each facet). Table 1.1 shows how the facets correspond to the different forms of research thinking in which responsive educators engage.

Purposive thinking is developed and required as teachers work out what they are doing through an iterative process of embarking and clarifying, re-embarking and reclarifying. *Embark and clarify* are intentionally general verbs, chosen to convey the myriad ways that students and teachers work out what it is that they do, achieve, make or think about. This facet includes posing research questions or hypothesising, framing project goals, determining the parameters of a problem or issue, being piqued by a classroom occurrence or a conversation in the staffroom, or resolving to learn something. Repeated and diverse engagement in embarking develops, over time, *purposive thinking*. For educators, this may take the form of anything from literature reviews, theory testing in the classroom, to quick responses to classroom or school events, and leads to crisp and clear problem definition or redefined learning intentions for a lesson. A contention of this book is that all research thinking, including purposive thinking, is best developed in numerous diverse contexts over years (Moser et al., 2017) where teachers or students embark and clarify in many different ways. Thinking that develops a sense of purpose, direction and clarity is both an enabler and outcome of embarking on research, therefore the facet is epitomised by the question 'what is our purpose?' In affective terms, a major driver and outcome of research thinking is that the learning environment would enable the development of *curious* and *empathetic* teachers (Willison et al., 2020). The affective adjectives are indicative only: they are intended to inspire educator thought about what, in affective terms, they are striving to facilitate. It is the juxtaposition of verbs, affective adjective, key question and research thinking that represents the fulness of each facet and that describes research thinking.

Informed thinking is developed and used when teachers, in numerous contexts and with new perspectives, find information and generate data and ideas. *Find and generate* are verbs that drive teachers towards fresh perspectives, and so learn to use

Table 1.1 RSD facets, key questions and research thinking

Facet verbs	Facet affect	Key question	Research thinking
Embark and clarify	Curious/empathetic	What is our purpose?	*Purposive thinking*
Find and generate	Determined	What will we use?	*Informed thinking*
Evaluate and reflect	Discerning	What do we trust?	*Astute thinking*
Organise and manage	Harmonising	How do we arrange?	*Harmonising thinking*
Analyse and synthesise	Creative	What does it mean?	*Insightful thinking*
Communicate and apply	Constructive	How can we relate?	*Externalised thinking*

Adapted from the RSD in Willison (2018)

appropriate methodologies. Methodologies and outcomes of finding and generating often are viewed as 'research', however, in this book they comprise one facet of multi-faceted research thinking. The 're' in research imbues not merely more, but improved, refined and multi-faceted, thinking processes. Asking repeatedly 'what will we use?', *informed thinking* finds relevant information and, when this is insufficient, generates data as fuel for the research thinking. For teachers, treating the classroom as a perpetual site of real-time observation data is a substantial part of *informed thinking* and this enables real-time response, a powerful influence on student learning (Chin, 2006). Real-time response by teachers is, or can be, much more than a knee-jerk reaction if it is tuned and directed by multi-faceted research thinking.

*Astute thinking i*s facilitated by iteration after iteration of evaluation and reflection. *Evaluate and reflect* are processes where teachers determine the credibility of sources, information, data and ideas, and make their own research processes visible. The key question is 'what do we trust?' and the disposition wherein teachers become increasingly discerning. They determine the relevance and credibility of sources, information, data and ideas, curriculum documents and reviews and make their own research processes visible to themselves through reflection. Teachers look for stated and unstated biases in others' and their own educational information and data, and with each evaluation and reflection develop *astute thinking.* Astute thinking is not incredulous by default, but weighs up trustworthiness of parts and of the whole. Astute thinking applies this evaluative work to others' research and reflects on the effectiveness of one's own processes, including processes to review curriculum documents and research literature and to engage in classroom action research.

Harmonising thinking is progressively developed as teachers and students organise information and data to reveal patterns or themes, and manage teams, resources and processes. For example, Home (2017) used the RSD to develop a mind-map for a unit plan. The conceptual framework allowed him to clearly see and organise the learning emphases for the unit. To a large extent, analytical insight cannot be effectively generated unless organisational structures enable theme and pattern recognition, and so bringing information and data into harmony with issues being addressed is a major aspect of research thinking. Likewise, the harmonious arrangement of resources, teams and timeframes is a feature that enables other forms of research thinking. The central question for this facet, then, is 'how do we arrange?' Often organisation and management are seen to be merely technical, undertaught, under-developed and under-assessed (Willison, 2020a, 2020b). However, the enabling aspect of *harmonising thinking* means that teachers and students who do not develop this kind of thinking will struggle with all research thinking.

Insightful thinking is developed and employed as teachers and students learn time and again to analyse and synthesise. When teachers analyse information or data critically and synthesise new knowledge to produce coherent understandings, they are addressing the question 'what does it mean?' for classroom practice. Synthesis in particular has a creative element, where it is not just putting all the pieces together, but how they are so pieced. High school teachers are more likely than primary school teachers to focus on a limited range of subjects and have more specific conceptualisations about analysing and synthesising. It is crucial that all teachers form a fulsome

understanding of these processes, because their analysis and synthesis are the keys to unlocking their own deepened understanding of the classroom, whether through 'eureka' insights or, more commonly, a slow-dawning process. If teachers have a technical-orientation to analysis and synthesis, this may disguise the variety of analytical thinking processes and rich synthesis of understanding enabled by insightful thinking that is broad and versatile. Such a technical orientation may prioritise quantitative analysis and the search for trends, or qualitative analysis and identification of themes, however it is the variety of analytical and synthesising perspectives that give rise to deeper insights into the classroom.

Without insightful thinking, teachers risk a narrow, technical perspective that can unwittingly disconnect student learning across subjects. There is every advantage for students to learn specific details and ways of analysing, for example identifying statistically significant trends in quantitative data in mathematics or economics or processes to identify themes in qualitative data in history or English. But students should simultaneously learn that different subject interpretations are all valid and useful ways of thinking analytically, that is, teachers should help students make connections between different forms of analysis and synthesis, so that students too learn to be insightful thinkers. The metacognitive *transfer* of thinking, such as analytical thinking, is notoriously difficult to facilitate or achieve (Scherpereel et al., 2022). For teachers to recognise, articulate and validate to students the different analytical and synthesising processes used by other teachers is a way to help students make connections, compound their learning and develop insightful thinking that is, or becomes, transferable.

Externalised thinking is developed through communication and application processes that are pushed out and pushed in. *Communicating* is a process of external expression when teachers discuss, listen, write, perform, respond to feedback and present processes, knowledge and implications of teaching. When teachers *apply* their understanding, heeding ethical, cultural, social and team issues and audience needs, they are expressing this understanding externally. *Pushed out* means that thinking starts internally and works its way to expression. For example, teachers may have an idea, a question, an insight and throw it out there verbally, pictorially, numerically, in text and/or with body language for other teachers or students to discuss or use. Pushed out also means taking an internalised educational concepts and applying them to a student, an online class or in professional development. *Pushed in* means that as teachers chat, discuss educational concepts or observe the application of concepts, these external stimuli, in concert with prior knowledge and experience, formulate an individual teacher's thinking. Whether starting or ending outside, externalised thinking is manifest.

If any facet of research thinking is missing, this reduces the capacity of that thinking to answer, solve or address issues or concerns of the school, classroom or students. If multi-faceted research thinking is explicit in teachers' minds, such as through the use of the RSD, it is more likely they will make explicit the nature of research thinking to school students, and examples of this are evident in Chap. 2.

In the RSD the six facets are elaborated along a continuum of learning autonomy (Willison & O'Regan, 2007. See Willison, 2018 for an updated version) which

describes and guides, but does not prescribe, development of research thinking. Rather the RSD 'suggests that the learning environments needed for a promising future are ones in which every point provides value on the learning autonomy continuum.' (Fryer, 2022, p. 152). In the RSD autonomy is a 'tidal' concept, where movement back and forth is valued more than high or low levels in themselves, because this sense of movement can guide development that is relevant to the PST or the I-ST (see Willison et al., 2017 for a detailed description of autonomy and Chap. 7 for application). The following chapters of this book demonstrate teacher research thinking, as introduced below.

1.3 Summary of Each Chapter

Chapters 2–8 of this book provide background and context that provides authentic entry into understanding teachers' ways of engaging in research thinking in each context. In each chapter, research methodology, data and analysis are followed by a discussion of the research thinking evident. Section 1 focuses on in-service educators (I-STs, UEs and TEs), Section 2 on PSTs, and both emphasise research thinking for responsive teaching.

PSTs, I-STs, UE's and TEs experiences and contexts are crucial to understand the research undertaken in this book. Therefore Chap. 2 proves research vignettes based on participant observation data and Chaps. 3–6 include vignettes, stories of experience to provide a strong sense of context. Chapter 7 explains the Indonesian education context to readers who may be otherwise unfamiliar and Chap. 8 provides extensive description of the curriculum context.

1.3.1 Section 1: In-Service Educators

Section 1 pertains to practicing educators, with Chap. 2 focusing on an I-ST and his classroom practice, Chaps. 3 and 4 on I-STs enrolled in Master's degrees and Chap. 5 is on UE and TE research thinking. Chapter 2 is first in the sequence because it emphasises the influence of practicing teachers' research thinking on school students and demonstrates high levels of teacher autonomy in the classroom. Chapter 2 also brings together the audience and focus of this book, demonstrating the interactions between I-ST, PST and UE that are enabled by the RSD. Chapters 3 and 4 provide exemplars of how the research thinking of practicing teachers enrolled in Master's degrees may be developed. These degrees facilitate research thinking by engaging classroom teachers in sophisticated assessment tasks with a variety of levels of autonomy when developing open-access resources (Chap. 3) and research publications (Chap. 4). Chapter 5 then looks at how UEs, themselves teachers of undergraduate and Master's courses, may have their research thinking enhanced in Educational Development programs.

In Chap. 2, Home, an I-ST, Snelling, then a PST and Willison, a TE report a

research-based learning context in *High School Student Experiences of Teacher Research Thinking,* set in a geographically remote, resource-poor school in Australia. This chapter presents a Participant Observation study, conducted by the PST, of the I-ST's explicit facilitation of student research skills in a combined Year 9/10 subject named 'Impact' by the school. The data is presented as research vignettes, stories of teacher and student engagement in the classroom of 20 students. The focus of the vignettes is student involvement in teacher-guided tasks intended to facilitate student research skills and builds on the I-ST's earlier work (Home, 2017). The nature of the I-ST's research thinking is expounded, and the research skills of students that are evident in his classroom emphasised. It is the chapter's explication of influence on school students that is most crucial because the number one aim of all teacher education is to enable higher quality school student learning than would be the case without it.

In Chap. 3 Brown and colleagues from The University of Calgary, Canada, write about *Open Educational Practices (OEP) for Research Skill Development with In-service School Teachers.* Building on their earlier findings (Jacobsen et al., 2018) the authors describe how post-secondary instructors use open educational practices and layered assignments, feedback loops, and assessment to engage I-STs enrolled in graduate degrees in making research thinking explicit and accessible to a broader professional and academic audience beyond the duration of a course or program. The RSD conceptual framework is used to demonstrate how open educational practices can be used to facilitate research-based skills for examining meaningful problems of practice and engaging in a scholarly community of inquiry. The authors present their findings with two groups of graduate students (n = 24) and share results about their experiences with open educational practices in the graduate program and implications for I-ST.

Chapter 4 *Exploring In-service Teacher-Researcher Reflexivity: Education Research as Cultural work* is by Heck from the University of the Sunshine Coast, Australia. Heck considers how the prevalent technical view of educational research that provides generalisable solutions of 'what works' has compounded the distance between theory and practice. She adapts a cultural role for educational research which recognises I-STs as practitioner-researchers. Building on previous research (Heck et al., 2020) Heck's chapter examines a Teacher Educator's use of the RSD in the first semester of a Master's program to facilitate nine I-STs' reflective engagement in topics that deepened their pedagogy or practice and was a pathway to a professional publication. The implications of this work provide scope for researchers and practitioners to engage in dialogue that counters the sole focus on a technical 'what works' view of educational research and opens up new ways of working, thinking and researching in classrooms.

In Chap. 5 Tiala and Loy lay out *Research-Oriented University Instruction: The Research Skill Development framework and Communities of Practice* in their respective universities in Midwestern United States and on the Canadian prairies. In this chapter, the authors describe how the RSD was used in educational development for UEs. The authors found that to make lasting and meaningful change to classroom

instruction, it was valuable to engage and sustain instructors as a community-of-practice or network that can learn and evolve their practice together over a period of time. For communities of practice, the RSD framework can spark interest, provide common language, interrogate existing practices and envision alternative possibilities in teaching, and catalyse individual and group Scholarship of Teaching and Learning (SoTL). Building on their previous work (Guo et al., 2018; Tiala, 2017) and based on the perspectives and data provided by the authors' and members of their professional networks, this chapter positions the RSD as a valuable and strategic tool. The authors found the RSD useful for mitigating difficult problems by enabling flexible communities of practice to respond to and influence changing priorities across teaching, learning, research, and student-engagement mandates.

1.3.2 Section 2: Preservice Teachers' Research Thinking

Chapters 6 and 7 are rich in PST research thinking developed in digital contexts, where the former depicts a quick response to COVID pandemic-induced distance learning provision, using social media to which students already had access. The latter provides a more proactive and long-term planned response using Learning Management Systems and various media, so together these chapters capture digitally responsive teachers' research thinking. Chapter 8 has a focus on the richness of student learning enabled by Curriculum-based Undergraduate Research Experiences (CUREs) whether online, face-to-face or blended modes. Across Chaps. 6–8, Preservice teachers engage in University assignments that are structured to, and require, a variety of levels of research autonomy.

In Chap. 6 Mataniari and colleagues from Jambi University, Indonesia discuss *Preservice Teachers' Use of Social Media for the Development of Their Research Skills*. The authors build on previous work (Mataniari et al., 2020) and present their findings about developing PST research thinking through social media as guided by the RSD and used with 67 students in a second-year education course. In the chapter they explain how they scaffolded the development of digital learning strategies for interactive learning through widely-used online social media platforms. The outcomes of their study suggest that PSTs who develop research thinking through digital learning strategies show potential as curriculum designers who, as future school teachers, will have the capacity to create innovative social media-based interactive learning models for nurturing their own students' research skills.

In digitally-related work in a very different cultural zone, McLeod from Monash University, Australia, follows on in Chap. 7 with *Digital Skill Mythology and Understanding in Preservice Teachers*. McLeod notes that increase in complexity and importance of digital skills in society is not correlated with students' actual development of commensurate skills, despite the myth about students being 'Digital Natives'. That myth, she argues, leads to a down-playing of the need for explicit teaching of digital skills so that when these PSTs go on to become I-STs, they encounter the same assumptions as at university, leading to 'double jeopardy digital inequity'

(McLay & Reyes, 2019). McLeod explains how the digital skills implicit in the Research Skill Development Framework (RSD) were articulated in the Digital Skill Development (DSD) framework that she collaboratively devised for Monash University (McLeod & Torres, 2020; Pilz et al., 2021). McLeod presents data from a large metropolitan Australian University and compares self-reported digital skills of 219 PSTs with their demonstrated understanding of what digital skills encompass. Findings show which DSD skills PSTs recognised and which needed more focus in the unit of study, and provides the reader with strategies for their own diagnosis.

Palmer from the College of New Jersey (TCNJ), a public Liberal Arts University in the USA, looks beyond digital environments in Chap. 8 to discuss *Undergraduate Research for Preservice Teachers: Navigating its Rich Complexity and Novel Possibilities*. Palmer overviews student participation in targeted curriculum-based undergraduate research experiences (CUREs) threaded throughout the PST programs at TCNJ. The chapter then reports on the results of a qualitative case study of a teacher educator's approach to facilitating a research-integrated second-year pre-clinical adolescent psychology course in a secondary teacher education program. Palmer finds that student investment in research and future-oriented thinking creates robust pathways to their professional communities. There is also corroborating evidence of PST's capacity to persist across multiple learning environments where robust coursework opportunities for frequent rehearsal and iterations ensured the incorporation of integrated research thinking into habits of mind. Palmer concludes that CUREs enable students to identify themselves as generative thinkers, autonomous learners, and prideful teacher-advocates.

1.4   This Book's Contribution to Education Theory, Practice and Research

This book shows how responsive teachers are consumers *and* producers of research. As consumers, teachers draw on and discerningly adapt an evidence base that includes educational research literature and conference presentations, and from which they must extract meaning, consider others' ideas, and apply information judiciously to their classes. Decoding others' evidence bases, and the explicit or implicit theories of education that underpin these also requires teachers to make connections between theory and practice, known as research translation. As producers of research they generate pertinent data, determine what is effective and consolidate that as well as determine what needs to change. Adapting innovatively to students' learning needs and to contingencies poses the risk of disregarding existing good features of teaching, so approaches that discern what needs to stay and what needs to change are vital. Research thinking, activated through explicit development of educators' research skills, enables responsive teaching that consolidates, changes and connects practice.

This chapter characterised research thinking in terms of six forms of thinking associated with the research facets of the RSD comprising *Purposive Thinking, Informed*

Thinking, Astute Thinking, Harmonising Thinking, Insightful Thinking and *Externalised Thinking*. In big-picture terms, these are the forms of thinking that characterise not only research processes, but also evidence-based practice, critical thinking, problem solving, and digital literacy; this characterisation of research thinking can help educators and students see the connections between these otherwise disparate teaching and learning regimes. To enact effective change, consideration must be given to the ecology of learning, where changing one aspect of learning may have an impact on other key aspects. Responsive teachers perceive and understand the interconnectivity of the different components of the learning enterprise and so do not make changes without considering the broader context and interactions. Once changes are made, teachers also need to determine the value add and decide to consolidate, adapt or reject the changes.

The RSD facets and the associated research thinking characterised in this book can help make connections: between theory and practice; across physical and virtual classrooms; across subjects and disciplines for disciplinary thinking and for the highly interdisciplinary thinking required in Education; among often contending education theories and pedagogies, such as Direct Instruction and Discovery Learning; and between the different forms of research thinking listed above so that students are metacognitively aware of their growth. As an example, Chap. 2 evidences connections though RSD use between:

- PST, I-ST and UE
- teacher and high school student
- subjects as varied as Music and 'Impact'
- the years e.g., use with Year 5/6 and with Year 9/10
- and in different pedagogical stances, such as the Inquiry learning of the subject Impact and the content focus of Music

In a major contribution to research, the RSD framework accommodates the range of approaches teachers in schools and universities tend to draw on, regardless of framing by theorists, and so helps unearth otherwise hidden connections. The RSD's continuum of learning autonomy (Willison & O'Regan, 2007; Willison et al., 2017; Willison et al., 2020) provides a conceptual spectrum of possibilities for educational theory and practice and this continuum, therefore, can be used to guide and inspire research thinking that is mindful of a range of theoretical perspectives. This is a vital feature of the RSD, as it enables educators to be bricoleurs (Reilly, 2009) who make judgements about theory and piece together practice based on what is appropriate for their students.

While the RSD has been examined extensively for Higher Education in various disciplines, the evidence of effective use of the RSD in teacher education and for impact on school student learning is sparse. This book represents an important move to an evidence base in the neglected area of schooling to determine to what extent:

- PSTs develop research thinking
- I-STs enact research thinking

- I-STs' research thinking is maintained and enhanced through professional development
- RSD use facilitates research thinking that enables teachers to be responsive to their students' needs and improve student learning.

Each chapter is a content-rich microcosm where research skill development is implemented to promote responsive teaching. Individually, the chapters provide evidence of effective use by TEs of diverse approaches. What binds the chapters together and provides a holistic and profound sense of enlargement across education is their use of the RSD framework. Explicit research skill development, broadly perceived, shows great potential to enable teacher research thinking through which teachers are enabled to be responsive to the immediate, mid and long-term demands of their profession.

1.5 Conclusion

Research thinking enables responsive teaching that consolidates, changes and connects learning and teaching. The Research Skill Development framework can be used to facilitate such multi-faceted research thinking that is purposeful, informed, astute, harmonising, insightful and externalised. Research thinking is vital to deal with the complexities of being and becoming teachers who are not merely reactive, but are responsive, identifying not only what to change but what to consolidate as they see their part in the connections across all of student learning.

The chapters of this book show how educators from PST, I-ST and UE have applied the Research Skill Development framework and research thinking to make consolidations, changes and connections in their practice. The shared conceptualisation of the Research Skill Development framework has come to fruition in the research thinking that enables teachers to be responsive, striving to facilitate their students' own purposeful, informed, astute, harmonising, insightful and externalised thinking.

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John Willison is the Director of the Bachelor of Teaching at the University of Adelaide and a National Senior Teaching Fellow. He was a secondary school science teacher for 10 years using systematic approaches to improving his students learning. He has researched how teachers develop their students' research skills and other forms of sophisticated thinking for three decades.