Mathew A. White
Faye McCallum *Editors*

Critical Perspectives on Teaching, Learning and Leadership

Enhancing Educational Outcomes

Foreword by Anthony Seldon

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Foreword

I'm very pleased to be writing a foreword to this important book edited by Mathew White and Faye McCallum, the fruit of extensive research by them and their talented cohort of writers at the University of Adelaide's Enhancing Educational Outcomes research group.

Unlike medicine, education has not benefitted from the same level of high-powered and intensive research. We cannot conceive of medicine today without thinking of how research has completely transformed the experience and outcomes. But in education, the quality of research worldwide has often been really quite poor. Governments thus embark on a series of initiatives, primarily for political reasons, or for capricious ones, sometimes citing research randomly and without context or rigour, as the justification for what they have already decided to do.

The arrival of this book is thus to be welcomed, because it has much value to offer, not just Australia, but educators and governments worldwide. It will help ground education policy worldwide on rock, not shifting sands.

The book is divided into 10 chapters which explore the changing nature of the work of teachers in the light of a series of new challenges. The 21st-century has seen an explosion of concern about student well-being but has seen less work on the well-being of teachers. Yet if teaching staff are not relaxed and at their healthy best, they will be unable to perform at their best in the classroom. Stressed teachers become unwell and are far more likely than others to leave the career prematurely.

Other chapters examine the impact of the skills required for the world of tomorrow on the initial training for teachers on the integration of iPads into the education of teachers, on blended learning, on instructional theory, on the work and impact of the Program for International Student Assessment (PISA), on preservice teachers' perceptions of character and well-being, and on the key importance of school leadership in shaping the growth and development of teachers.

The most influential economist of the 20th century, John Maynard Keynes, said that practical politicians, whether they realise it or not, are influenced by ideas that were prevalent when they were younger. Ideas matter and they need to be grounded in real research. Yet many school leaders and education ministers the world over are influenced by flawed ideologies.

None is more damaging nor widespread than the philosophy that guides many school systems that schools should be concerning themselves just with cognitive development, rather than with the all-round nurturing of the talents of every child, including their artistic, emotional, physical, moral and indeed spiritual capabilities. The result is that we are turning out school leavers who are passive learners, afraid of making mistakes and often ill prepared for study in higher education, and the workplace. Far too many students are suffering from mental difficulties.

Optimal right initial teacher training, whether for preservice or graduate teachers, is all important in setting them on the right road. This volume has never been more timely. It is full of practical common sense and wisdom and should be devoured by all.

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Together with Professor Faye McCallum, Associate Professor Mathew White co-authored the original book proposal following collaboration with the writing team. We thank the authors from the University of Adelaide's Enhancing Educational Outcomes research group, Dr. Walter Barbieri, Dr. Brendan Bentley, Dr. I Gusti Ngurah Darmawan, Dr. Lynda MacLeod, Dr. Robert Matthews, Dr. Linda Westphalen, and Dr. John Willison for their enthusiasm and perseverance. The advice of Nick Melchior, executive editor for the Social Sciences in Australia and New Zealand at Springer Australia assisted with the development of this book. We also thank Balaganesh Sukuma who was responsible for the project coordination of the book at Springer.

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September 2020

Mathew A. White
Faye McCallum

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About the Editors

Mathew A. White, Ph.D., is Deputy Head of the School of Education and an Associate Professor of Education at the University of Adelaide. Publications include *Future Directions in Wellbeing: Education, Organisations, and Policy* (with Gavin Slemp and Simon Murray), and *Evidence-Based Approaches in Positive Education Implementing a Strategic Framework for Well-being in Schools* (with Simon Murray) published by Springer. In 2020 he was presented the Distinguished Contribution to Research in Educational Leadership Award by the South Australian Branch of the Australian Council for Educational Leaders (ACEL-SA). He was elected a Fellow of the Australian College of Educators in 2017.

Faye McCallum, Ph.D., is Head of the School of Education and a Professor of Education at the University of Adelaide. Her research books include *Nurturing Well-Being Development in Education: From Little Things, Big Things Grow* (with Deb Price) published by Routledge and a forthcoming book *Well-Being Education and Professional Practice: Transforming Teaching* (with Mathew A. White) published by Springer. She was awarded the 2019 Australian Council for Educational Leaders South Australian Branch Dr. Alby Jones AO Gold Medal 'for her contribution to the study and practice of educational leadership'. She was a finalist for the 2020 Telstra Business Women's Awards.

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Chapter 1
Critical Perspectives On Teachers And Teaching: An Appreciative Examination

Mathew A. White and Faye McCallum

Abstract With increasing levels of teacher accountability, more knowledge and an understanding of student achievement in reading, writing and scientific knowledge, educators and school leaders are confronted by the pace of change in the twenty-first century and the educational disruption of COVID-19. The aim of this chapter was to provide an overview of significant international forces considered in this book and an overview of the conceptual framework of appreciative inquiry. By adopting a practitioner-researcher perspective, we considered the problem of how to strengthen educational outcomes considering the United Nations Sustainable Development Goals and the 2018 Programme for International Student Assessment results. While controversy abounds in the interpretation and education policy responses to trends in these surveys, there is a body of evidence about the roles teachers and teaching play in enhancing educational outcomes. Finally, we contend because of the appreciative approach; the book is new knowledge on enhancing educational outcomes essential for developing a well-educated population.

Keywords Twenty-first-century skills · Education policy · Secondary education · Teacher education · Teacher wellbeing · Theory of education

The significance of enhancing educational outcomes has been highlighted by the immediate and widespread disruption to learning due to the COVID-19 pandemic. The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2020) claims that by mid-May of 2020 some '1,198,530,172 learners', or '68.5% of total enrolled learners' in '153 country-wide closures' enrolled at 'pre-primary, primary, lower-secondary, and upper-secondary levels of education were affected [ISCED levels 0 to 3], as well as at tertiary education levels [ISCED levels 5 to 8]' (UNESCO, 2020). The OCED (2020a) have proposed 'The Learning Compass 2030', which 'defines the knowledge, skills, attitudes and values that learners need

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to fulfil their potential and contribute to the well-being of their communities and the planet'. The United Nations Sustainable Development Goals (UNSDG) acts as the 'blueprint to achieve a better and more sustainable future for all'. Here, the United Nations recognises the significance of enhancing educational outcomes for all students. For example, Goal 4 of the UNSDG focuses on quality education, claiming, 'a quality education is a foundation for creating sustainable development' (UN, 2019). In the Australian context, the *Alice Springs (Mparntwe) Education Declaration's* (Council of Australian Governments Education Council, 2019) outlines the two goals for the Australian education system. These are, Goal 1: The Australian education system promotes excellence and equity and Goal 2: All young Australians should become confident and creative individuals, successful lifelong learners, and active and informed members of the community. What are the major controversies in enhancing educational outcomes? The Organisation for Economic Cooperation and Development (OECD) (2019) notes that 'on average across OECD countries and in 43 education systems, students who perceived greater support from teachers scored higher in reading, after accounting for the socio-economic profile of students and schools' and 'a positive school climate is one of those things that is difficult to define and measure, but everyone—including parents—recognises it when they see it' (pp. 15–16).

We argue that enhancing educational outcomes is essential to developing a well-educated population (Albrecht, 2018; Aldridge & McChesney, 2018; Byrne, Rietdijk, & Pickett, 2018). Enhancing educational outcomes is key to a nation's ongoing creativity, prosperity, peace, democracy and human flourishing. While it might be a cliché to argue that change abounds in education, it is difficult to find another educational epoch where such a vast array of global challenges has tested teachers, principals and governance (Araneda, Guzmán, & Nussbaum, 2018; Podolsky, Kini, Darling-Hammond, & Bishop, 2019; Spillane, Paquin Morel, & Al-Fadala, 2019; White & McCallum, 2020).

Internationally, teacher quality and retention are a growing concern as highlighted by Schleicher (2020). For example, UNESCO claims that, by 2030, there will be a global shortage of teachers, with 74 countries facing an acute shortage, threatening educational outcomes worldwide. Today, it is more widely recognised that teachers and teaching are the heart of successful communities of practice with complex relations between initial teacher educators, university researchers, students, families and school systems (Ford & Youngs, 2018; Gonski, 2018; Hogan, Thompson, Sellar, & Lingard, 2018; Mansfield & Beltman, 2019). Over the past decade, we have seen the rise of greater professional accountability and evidence-based, evidence-informed and diagnostic teaching approaches, which has transformed professional practice. Increasingly, teachers are asked to interpret data to develop learning and teaching interventions to enhance student learning outcomes, where one year's instruction is matched with one year's student learning growth (Brooks, Huang, Hattie, Carroll, & Burton, 2019; Brown, 2018; Gonski, 2018; Hawthorne, Vella-Brodrick & Hattie, 2019).

While some schools and teachers are constrained in twentieth-century teaching paradigms, others are already integrating virtual reality (VR), augmented reality

(AR), artificial intelligence (AI) and digital technologies across learning, teaching and student experiences from the earliest years (Care, Kim, & Scoular, 2017; Lavy, 2019; Seldon, 2018; World Economic Forum [WEF], 2015). The integration and, in some instances, the imposition of these technologies are having both positive and unintended wellbeing impacts. For example, the Economist ("Generation Z is stressed", 2019) reports that Generation Z (people born since 1997) is more 'stressed, depressed and exam-obsessed' and that they are 'generally less hedonistic' and 'better behaved' than the earlier generation. The Pew Research Center noted that in a study of 920 13–17-year-old Americans, the people of Generation Z were more concerned about issues surrounding mental health and bullying, as opposed to issues around alcohol, with 70% of respondents claiming that anxiety and depression were concerns for their peers ("Generation Z is stressed", 2019). With the rapid pace of emerging technologies, it is no longer sufficient to be foundationally literate; certain social, emotional and cognitive characteristics are now also regarded as indispensable.

Over the past two decades, there has been exponential growth in new research into, and the practise of, twenty-first-century skills manifested in many forms such as character education, learning and teaching for twenty-first-century skills, social and emotional learning, wellbeing and positive education. Discussion around the new skills needed for the twenty-first century has dominated education discourse since the mid-1980s in the United States of America, the United Kingdom and Australia. During this time, the focus shifted to preparing students to learn content and knowledge, literacy, numeracy and emerging technologies. The new competencies that are associated with these skills share common themes, including reasoning, evidence, critical thinking and communications (WEF, 2016).

In an era of unprecedented teacher and school leadership accountability, it is time to examine contemporary research that considers how to enhance education outcomes from practitioner-researchers and school–university lenses (Yi Chan, Sloan, & Chandra, 2019). The *Alice Springs (Mparntwe) Education Declaration* argues that '[e]ducation plays a vital role in promoting the intellectual, physical, social, emotional, moral, spiritual, and aesthetic development and wellbeing of young Australians, and in ensuring the nation's ongoing economic prosperity and social cohesion' (Council of Australian Governments Education Council, 2019, p. 2). Significant education research asserts that to thrive in today's world, school students need a different mix of skills than in the past. It notes that 'in addition to foundational skills like literacy and numeracy, they need competencies like collaboration, creativity, and problem-solving, and character qualities like persistence, curiosity, and initiative'.

Internationally graduating teachers are entering the workforce at a time of unprecedented change and complexity, with many leaving within the first 5 years (Mansfield & Beltman, 2019). Increasingly, initial teacher education (ITE) programmes are being challenged to show evidence of classroom readiness and evidence of impact. The WEF claims, 'To thrive in the 21st century, students need more than traditional academic learning. They must be adept at collaboration, communication, and problem solving, which are some of the skills developed through social and emotional

learning' (p. 4). A report on Securing the 21st Century Teacher Workforce claims that,

> nearly half of all new k-12 teachers in the United States leave the profession within five years… teachers who remain in the profession often move on to other schools, suspending lower-performing schools in cycles of chaotic management by isolating teaching staff who aren't around long enough to the build collaborative momentum needed to leverage student outcomes (Edge et al., 2017, p. v).

However, teacher quality and retention are a concern (Heffernan, Longmuir, Bright, & Kim, 2019; Reid, 2019). Fifty-eight per cent of Australian teachers describe their intention to leave the profession and a further 62% claim workload as a significant catalyst to retire early (Heffernan, Longmuir, Bright, & Kim, 2019, p. 10).

ITE and pre-service teacher (PST) quality are being challenged due to a failure to shift from patterns with proven poor educational outcomes. In addition, there is increasing pressure for PSTs to demonstrate evidence of their teaching ability and impact on student learning, which in turn increases emphasis on league tables, wellbeing issues (Collie & Perry, 2019; Hugo, 2007) and health issues, including mental health issues (Vesely, Saklofske, & Nordstokke, 2013). *Critical Perspectives on Teaching, Learning and Leadership: Enhancing Educational Outcomes* argues that the quality of graduate teachers is a critical step in educating flourishing students (Carter et al., 2018; McCallum, Price, Graham, & Morrison, 2017; White & Murray, 2015; White & McCallum, 2020). This book evaluates the opportunities, issues and obstacles facing the preparation of teachers through creative and multidisciplinary perspectives. These are consistent questions posed over the past two decades of ITE research, focusing on evidence-based teaching strategies. The debate about teacher quality and the impact on learning outcomes is a contentious area. This book argues that there is a lack of specificity around notions of crucial issues to enhance educational outcomes. Issues such as character and wellbeing, twenty-first-century learning and e-learning pedagogy mean that the education sector is presented with an ironic paradox: there is explicit consent that it is essential to consider, monitor and respond to what constitutes an effective teacher, yet there is little sector-wide consensus on what it actually is.

Today, education is experiencing unprecedented change. This is having a significant impact on school systems, learning outcomes and the wellbeing of students and teachers. As illustrated by the three volumes of the Programme for International Student Assessment (PISA) 2018 results, we now have a greater knowledge and understanding of the role teachers play in creating a positive impact on student learning outcomes. However, issues associated with initial teacher education (ITE), the professional development of educators, teacher and student wellbeing and how school systems operationalise twenty-first-century learning abound. This book addresses the significant problems that arise for pre-service and graduate teachers who are unprepared for the complexity of twenty-first-century teaching (Fernandes,

Peixoto, & João, 2019). ITE is an essential factor in graduating quality teachers. Therefore, teachers must be able to contribute to the social, emotional, cognitive, spiritual and physical wellbeing of their students (Allen & Kern, 2018; Allen, Kern, Vella-Brodrick, Hattie, & Waters, 2018; Brown, 2018; White & Kern, 2018). A shortage of literature exists that focuses on what inhibits teacher development. Universally, there are challenges in this field: attracting candidates into ITE with a combination of academic strengths and character qualities, retaining the best teachers in the profession and finding evidence of classroom readiness.

1.1 How This Book Was Developed

This book is the culmination of over 6 months' collaborative work during 2019 by the practitioner-researchers, all academics, working in the field of ITE from the University of Adelaide's Enhancing Educational Outcomes research group. The book investigates evidence-based and evidence-informed approaches to teaching, learning and leadership. The group focuses on research topics including assessment, measurement and evaluation; governance, leadership and management; ITE; and STEM and wellbeing education. *Critical Perspectives on Teaching, Learning and Leadership: Enhancing Educational Outcomes* focuses on the major forces affecting teacher preparation, teaching and school leadership during an era of notable change.

1.2 Conceptual Framework

1.2.1 Appreciative Inquiry

We adopt appreciative inquiry as the conceptual framework for this book. Appreciative inquiry is "based on the simple assumption that every organisation has something that works well, and those strengths can be the starting point for creating positive change [and it] is also intended for discovering, understanding, and fostering innovations" (Cooperrider, Whitney, & Stavros, 2008, p. 3). The appreciative inquiry approach was first developed by Cooperrider and Srivastva (1987). It was later extended by Cooperrider and Sekerka (2006) who argue that it enables "new ways of understanding the processes and dynamics of positive outcomes in organisations are rapidly emerging" (p. 223). Furthermore, they asserted that "Appreciative inquiry is a process of search and discovery designed to value, prize, and honor. It assumes that organisations are networks of relatedness and that these networks are alive" (Cooperrider & Sekerka, 2006, p. 224).

1.2.2 Affirmative Topic Choice

Appreciative inquiry uses an affirmative topic choice as a catalyst to start the research process, an affirmative topic choice "selectively seeks to locate, highlight, and illuminate what are referred to as the life-giving forces of the organisations existence, its positive core" (Cooperrider, Whitney, & Stavros, 2008, p. 4). Usually, the affirmative topic choices are voted upon by participants. However, as shown in Fig. 1.1 for this book, the editors pre-selected "enhancing educational outcomes" as the affirmative topic choice. This was based on the process described by Cooperrider, Whitney, and Stavros (2008, pp. 35–39). This book is written from a practitioner-researcher perspective, with each contributor having significant practitioner experience first in classrooms as teachers, from the early years to senior secondary education, as senior leaders with executive experience in Independent, Catholic and Government schools, as Board Directors, as teacher educators and as educational researchers. Among the chapters in this book, scholarly contributions focus on current issues. Topics explore the changing nature of teachers' work, the impact of twenty-first-century skills in ITE, the integration of iPads in pre-service teacher education, blended learning, instructional theory, the Programme for International Student Assessment results, pre-service teachers' perceptions of character and wellbeing and the role of school leadership in shaping professional teachers' growth. The chapters and the book publish new knowledge and original research material.

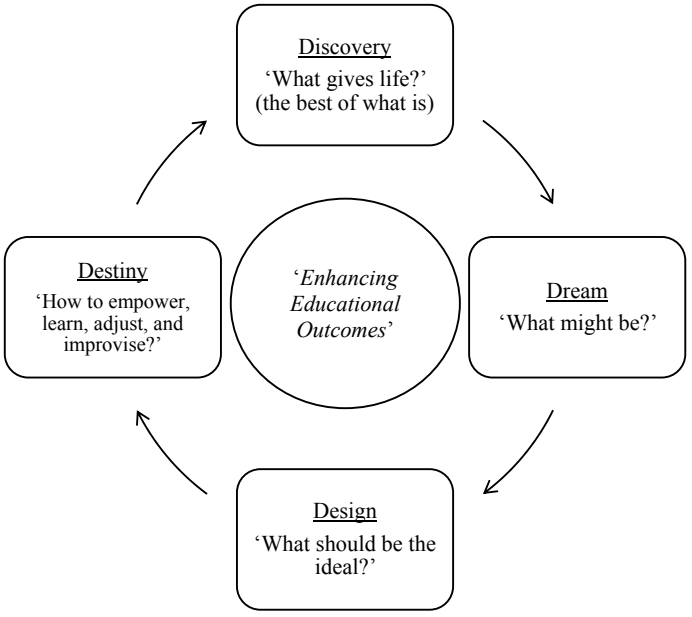

Fig. 1.1 Chapter structure for Critical Perspectives on Teaching, Learning and Leadership: Enhancing Educational Outcomes based on the appreciative inquiry 4-D cycle (adapted from Cooperrider, Whitney, & Stavros, 2008, p. 34)

1.2.3 4-D Cycle

Appreciative inquiry employs a four-step cycle to examine an affirmative topic from a diverse range of perspectives. We followed this process (1) Discovery, or appreciating the best of what is (2) Dream, or envisioning what might be, (3) Design, or co-constructing the ideal and (4) Destiny, or how to sustain for the future. Cooperrider and Sekerka (2006) call this the 4-D cycle. The book's conceptual framework of the 4-D cycle is outlined below:

- **Discovery,** or appreciating the best of what is: the discovery phase of the appreciative inquiry process investigates existing strengths within the context of the affirmative topic. It encourages researchers to engage in meaning-making. Moreover, the discovery phase enables researchers to consider future possibilities within the context of the problem chosen (Cooperrider, Whitney, & Stavros, 2008, pp. 6, 105–130).
- **Dream**, or envisioning what might be: this phase focuses upon the best of what is envisaged as potential future directions within the lens of the appreciative topic. Research explores the strengths and limitations of the topic chosen (Cooperrider, Whitney, & Stavros, 2008, pp. 6–7, 131–162).
- **Design,** or co-constructing the ideal: in this stage, the researcher, considers the future implications. This step is where researchers may find potential future "strategic intent" for a topic and who it may affect (Cooperrider, Whitney, & Stavros, 2008, pp. 7, 163–200).
- **Destiny**, or how to sustain for the future: in this stage, the researcher considers how innovations may be operationalised. (Cooperrider, Whitney, & Stavros, 2008, pp. 4, 201–229).

Each author was invited to respond to the affirmative topic choice using the first two steps of the 4-D cycle (1) Discovery and (2) Dream. The outcome of the appreciative inquiry process enables an "inquiry into the appreciable world is a vehicle for creating and developing positive change, not just within the present moment, but also over time… [and that] inquiry into the positive, naturally occurring or deliberate, is a source of positive change as it elevates and extends the best of what is present in the organisational system" (Cooperrider & Sekerka, 2006) p. 232). Consequently, chapters investigate the following questions:

- What impact does the changing nature of teachers' work have on teacher preparation and the teaching profession for the twenty-first century? (Discovery)
- What role does wellbeing play on teacher quality? (Discovery)
- How can educators implement and evaluate the outcomes of blended learning? (Discovery, Dream and Design)
- What impact do teachers have on learners? (Discovery)

As represented in Fig. 1.2 the outcome of the 4-D process is the book's chapter topics and structure. The themes which emerged from the conceptualisation of the book include the topics of teacher's wellbeing, development in initial teacher education, the immediate impact of emerging technologies on the professional practice of pre-service teachers, the role of blended learning in evaluation, instructional theory, factors of quality and equity in mathematics achievement in Southeast Asia, the evaluation of a pre-service teacher course to prepare candidates for professional practice, pre-service teachers perception of wellbeing and its role within professional practice and the role of school leadership in developing professional learning communities. We believe the chapters in this book will be of interest to educators who aim to have an impact on student learning outcomes. The chapters in this book adopt a practitioner-researcher perspective in that each section examines issues

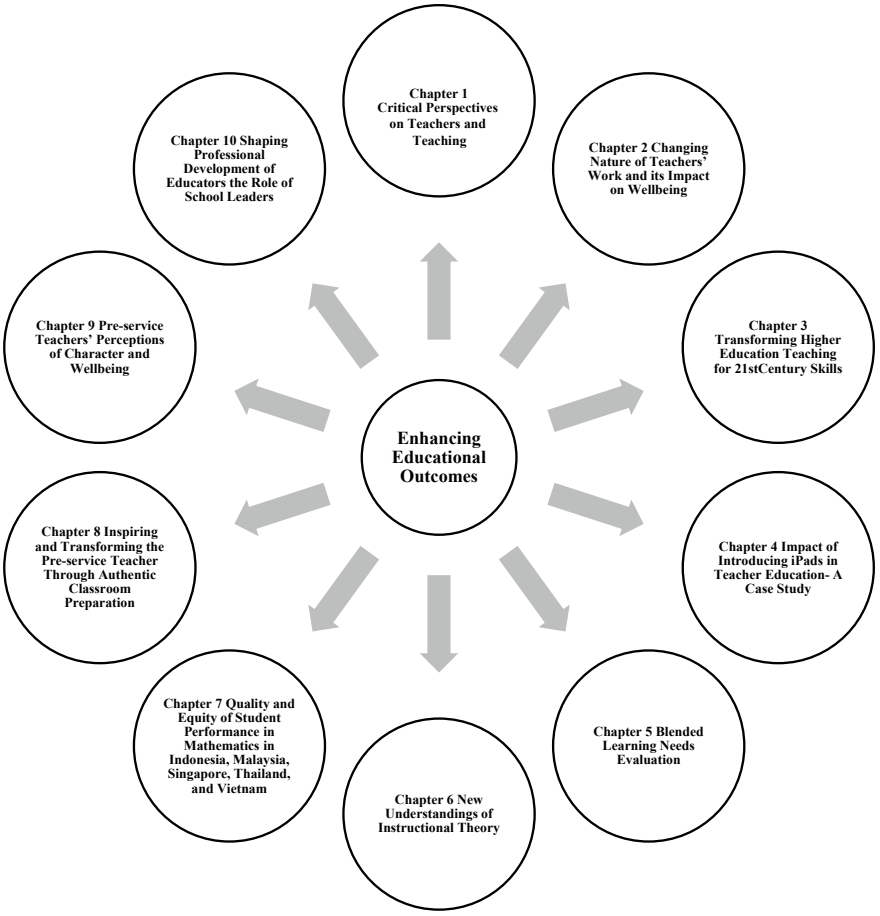

Fig. 1.2 Chapter structure for Critical Perspectives on Teaching, Learning, and Leadership: Enhancing Educational Outcomes

related to teacher professional practice, leadership or ITE. Many chapters embrace the dual roles of teacher educators who are researchers. Chapters adopt various research methods and theoretical approaches including appreciative inquiry (Cooperrider & Srivastva, 1987), a broader pragmatic worldview (Tashakkori & Teddlie, 2010), an ecological framework (Bronfenbrenner, 1972, 1979), Freire's *Pedagogy of the Oppressed* (1971, 1998, 2005) and the Substitution, Augmentation, Modification, Redefinition (SAMR) model (Puentedura, 2015).

Over six months, the Enhancing Educational Outcomes group crafted individual chapters and met to collaborate during two research group writing days. During the first writing day, authors presented their introduction, adopted method, results, discussion and conclusion. This process was an essential step for developing research claims and ensuring there was coherence across all chapters. Here, round 1 of an open review within the research group for each chapter was undertaken. All reviews and author responses to these reviews were documented as part of the editorial process. During the second writing day, the chapters drafted by each author underwent an open peer review. All participants knew the identity of the author and the reviewers. Each reviewer was asked to provide feedback to the authors based on the quality of the research question, the introduction and background of the chapters, the aims of the study, the method or theoretical framework adopted, the results and the discussion. In turn, the authors were asked to respond to their peers' feedback and integrate changes, as evidenced in their final chapters. During this final stage, the manuscript was closely reviewed by two anonymous experts in the field selected by the publishers. All authors responded to feedback from the final anonymous review before being submitted to Springer.

1.3 The Book's Structure

In this chapter, we have established this work's significance, outline appreciative inquiry, the book's conceptual framework and the structure. We also have provided an overview of each chapter.

In Chap. 2, 'The Changing Nature of Teachers' Work and its Impact on Wellbeing', Faye McCallum asserts that Australia's graduating teachers are entering the workforce at a time of unprecedented change, increased education opportunity and overwhelming complexity and investigates teachers' health and wellbeing may be at risk because of this pursuit. McCallum also presents the findings of research undertaken in Australia and Canada to investigate an early career, mid-career and those in leadership and the impact of wellbeing on professional practice.

In Chap. 3, 'Transforming Higher Education Teaching for 21st-Century Skills', Linda Westphalen reflects on the processes by which teachers are accredited in Australia and considers this in the context of the development of twenty-first-century skills. Westphalen examines these developments in the context of the presented by the World Economic Forum's twenty-first-century skills.

In Chap. 4, 'The Impact of Introducing iPads in Teacher Education', Walter Barbieri examines a case study investigating the integration of 1:1 iPads in an undergraduate Individual Teacher Education (ITE) degree influenced the digital competencies of its participants. The chapter argues for the inclusion of digital technologies in ITE.

In Chap. 5, 'Blended Learning Needs Blended Evaluation', John Willison argues for a blended learning evaluation framework introduces the Blended and Engaged Learning Zones (BELZ) to addresses the imbalance in the literature. Willison contends that one of the limitations of earlier research has been the lack of integration for a framework that considers the significance of learning zones when evaluating the impact on enhancing educational outcomes.

In Chap. 6, 'New Understandings of Instructional Theory: Finding the Instructional Sweet Spot', Brendan Bentley deconstructs Constructivist Learning Theory and the Cognitive Load Theory and contends that instructional models that produce learning.

In Chap. 7, 'Quality and Equity of Student Performance in Mathematics in Indonesia, Malaysia, Singapore, Thailand, and Vietnam', I Gusti Ngurah Darmawan examines issues of quality and equity of mathematics performance for 15-year-old students in PISA 2015 from five participating Southeast Asian countries.

In Chap. 8, 'Inspiring and Transforming the Pre-service Teacher Through Authentic Classroom Preparation', Robert Matthews assesses a course design was examined that sought to bridge the university experience of PSTs with the classroom experience through a focus on authenticity.

In Chap. 9, 'Pre-service Teachers', Perceptions of Character and Wellbeing' Mathew White investigates pre-service teachers', perceptions of character, wellbeing and pedagogy and argues that initial teacher education programs are fertile ground for integrating research-informed approaches concentrating on the teacher's role.

In Chap. 10, 'Shaping Professional Development of Educators: The Role of School Leaders', Lynda MacLeod investigates the role of principal leadership in professional learning communities.

With increasing challenges from government, regulation and unprecedented levels of education reform as outlined in the OECD (2020b), *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals,* OECD (2019b), *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners* and OECD and (2018). *Reviews of National Policies for Education*, it has been claimed that there is an 'impending crisis' in the preparation of teachers and the teaching profession (Preston, 2019). This book focuses on topics as diverse as student learning academic growth, classroom practice and teacher efficacy. Discussion is about the social and emotional elements of a 'good teacher'. Together with this discussion were debates around the most effective teaching strategies and the effectiveness of initial teacher educators. Themes in the debate included what initial teacher educators should know and understand about discipline content and pedagogy. More recently, policies have concentrated on professional standards and character (ACARA, 2018; Australian Institute for Teaching and School Leadership, 2018).

As Alma Harris, Professor of Educational Leadership and Policy, Department of Education, University of Bath, asserted, 'The imperative to recruit, develop, and retain great teachers has never been stronger or more critical' (Edge et al., 2017, p. vi). At a time of increased global accountability and scrutiny, surveys including the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study have created greater transparency for policymakers, education leaders and teachers to critique as well as reflect on educational outcomes and performance (Fullan & Pinchot, 2018; Hitt & Meyers, 2018). While controversy abounds in the interpretation and education policy responses to trends in these surveys, a growing body of evidence has appeared regarding the roles that teachers and teaching play in enhancing educational outcomes. For example, teacher quality, attitude, effectiveness and motivation are found to be essential in high-performing systems. Teacher motivation, engagement and ability to teach well have appeared as critical. Educators fulfilling the promise of the UNSDG for enhancing educational outcomes are vital.

Across ten chapters, this book examines diverse topics, including approaches to learning outcomes, education policy, the philosophy of education, professional development of educators, issues of school leadership, school systems, secondary education, student wellbeing, teacher education, teacher wellbeing and the theory of education. Experts in their respective fields write each of the chapters; this edited volume contributes to the evaluation of contemporary issues in ITE. We argue that enhancing ITE is essential for developing a well-educated population. It is key to the nation's ongoing creativity, prosperity, peace, democracy and human flourishing.

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Chapter 2
The Changing Nature of Teachers' Work and Its Impact on Wellbeing

Faye McCallum

Abstract The world is in the midst of an unprecedented technological revolution and changes are underway on a vast scale with digitalisation transforming economies, governments and societies in complex, interrelated and often unpredictable ways. These changes are fundamentally altering how people live, interact and work and are inevitably affecting how we do our work, thus requiring a transformation in design and delivery. Teaching is not immune to this revolution; in fact, it must play a critical part to prepare young people for innovative, productive and socially just futures. Yet teaching is a highly complex profession. Australia's graduating teachers are entering the workforce at a time of unprecedented change, increased education opportunity and overwhelming complexity. They start their teaching degrees wanting to contribute positively to learning and engagement with young people but are often overwhelmed with the complexity of their roles and can grapple with professional identity, poor school literacy and numeracy and declines in student engagement in schools. We know that teaching is one of the most rewarding careers a person can encounter, yet it is one with increasing levels of workload; high levels of accountability, measurement and administration; is experiencing new challenges in student and parent behaviours; and is a rapid ever-changing digital and global sector. This chapter highlights that twenty-first-century skills are required to prepare today's young people for New Work Smarts in 2030 and beyond, yet teachers' health and wellbeing may be at risk because of this pursuit. Research in Australia and Canada has been undertaken on how well teachers feel they are prepared to manage their work by sampling early career teachers, mid-career teachers and those in leadership roles. A well-educated population is key to a nation's prosperity, peace and human flourishing, and thus high-quality teachers must be attracted and retained, and the extent to which this is achieved is highly dependent on their wellbeing.

Keywords Twenty-first-century skills · Professional development of educators · Teacher education · Teacher wellbeing · Technologies

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2.1 Introduction and Background

Amidst the twenty-first century challenges to teachers and teaching lies an opportunity to enhance educational outcomes for all learners because this has not yet been achieved in all countries across the globe. Yet the rapid change to teachers work due to the onset of technology, global crises like pandemics and climate change, and intensification of the work can result in adverse factors on teachers' wellbeing that may inhibit progress for learners. It is time to consider changes to teachers' work, taking into account its impact on teachers. We need teachers to be 'well' so that our children and young people can be 'well' too. If this can be achieved, educational outcomes will be enhanced for all.

Contemporary teaching practices and the evolution of the new world, New Work Smarts, has led to a context for teachers that challenges many aspects of their work. Many talk about an increasing teacher shortage, although accurate numbers are not clear. Some estimate that about 53% of newly graduated teachers intend to leave the profession within five years after graduation. Teacher attrition is particularly salient for early career teachers, within the first 5 years of the profession, and for teachers over 50 who take early retirement (den Brok, Wubbels, & van Tartwijk, 2017).

On average across the OECD countries and economies in TALIS, teachers who report experiencing stress in their work "a lot" are twice as likely as colleagues with lower levels of stress to report that they will stop working as teachers in the next 5 years. In Australia, teachers who report experiencing stress at their work "a lot" are 90% more likely to want to leave teaching in the next 5 years (OECD, 2020). Other significant workforce challenges for the profession include a decline in those attracted to the profession, frequent turnover, casualisation and early career teachers being forced to teach in areas that they are not trained for. Therefore, in this context, there is an urgent need to understand teachers' work in a better way and, critically, the impact that these factors have on their wellbeing.

Seldon (2018) claims that there is no more important issue facing education, or humanity at large, than the fast-approaching revolution of AI, alongside AR and VR. This he refers to as the Fourth Education Revolution. Recently, we have been alerted to the future of work skills required by our young people as they transition from schooling to employment, training or university. Although not a new concept, the urgency now is that our young people require skills and competencies far greater than what has been realised before and technology is often the driver, moving at a far greater pace than anyone imagined. Countries have greater, even urgent, concerns in economic, social and environmental spheres and young people are getting involved at a much higher level than before. Bennett and Lemoine (2014) state that many now need to survive and thrive in a world recognised as volatile, unpredictable, complex and ambiguous. Lambert (2017) identifies five drivers for the twenty-first-century competencies debate: economic competitiveness; contemporary employability skills and dispositions; active citizenship and understanding regarding identity; improved social cohesion, understanding and valuing of diversity and respect; and competencies related to personal growth.

Competences and skills for the twenty-first century have begun to attract global attention as many predict what our young people might require to function effectively in an ever-changing world. OECD's The Future of Education and Skills: Education 2030 *The Future we want* (2018) and *UNESCO's Transversal Competencies* project (McIlvenny, 2019) are but two attempts to define future directions and guidance to support students to navigate the complexities of work and life. The WEF (2015, p. 3) refer to 16 skills for the twenty-first century comprising 6 foundational literacies, 4 competencies and 6 character qualities (see Fig. 2.1). According to a report by Price Waterhouse Coopers (2017), 44% of jobs are at a high risk of being disrupted by computerisation and technology in the next 20 years. This movement from teacher-centred to student-driven, from pilots to prototypes, from scarcity to abundance and from compliance to innovation can be driven by teachers and school leaders as argued by Parry (2017). Teachers, leaders and schools just need to be agile and adaptable.

The Third Education Revolution saw the development of the printing press, which meant textbooks, began to be used for the first time, then subjects emerged, and schools became compulsory although the curriculum was very traditional (Seldon, 2018, p. 17). Reflecting on the Third Education Revolution, Seldon (2018) claims

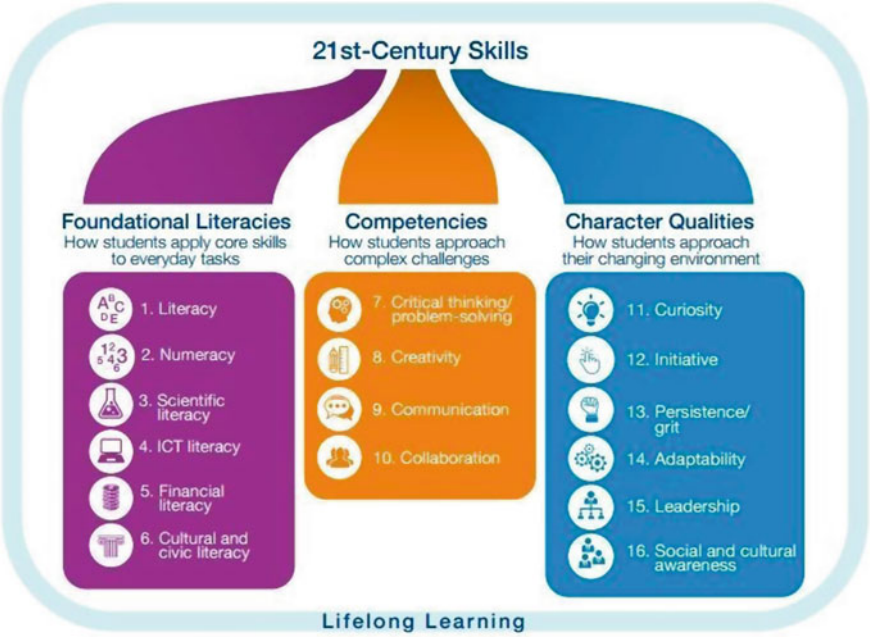

Fig. 2.1 Students require 16 skills for the twenty-first century. *Source* World Economic Forum's New Vision for Education: Fostering Social and Emotional Learning through Technology World Economic Forum, Switzerland, March 2016.

that it was an increasingly frustrating experience for teachers. This was because they were burdened with too much administration and repetitive tasks that prevented them from actual teaching. He claims that teacher workload, stress and retention became a problem (p. 52). The problems include:

1. Failure to defeat entrenched social immobility
2. Inflexible progress through the education system
3. Teaching overwhelmed by administration
4. Large class sizes inhibit personalised and breadth of learning
5. Homogenisation and lack of individuation of personality (p. 54).

The problems are all systemic but may be ameliorated by a Fourth Education Revolution.

The future teacher, therefore, will need to adapt to the growing use of automation and digital learning tools. This will change how teachers do their job, which might mean freeing up their time to interact more with students (estimated that this may increase from 29 h in 2006 to 33 h in 2030). It is estimated that by 2030, teachers will routinely use digital technology to make classroom education a more interactive, student-centred experience. They will most likely spend less time grading (down from 5 h in 2006 to 1 h in 2030) and more time facilitating self-directed learning (4 h in 2006 increasing to 14 h in 2030) (The New Work Smarts, Foundation for Young Australians, 2017, p. 6). We, therefore, ask what is the relevance and impact on teachers' wellbeing of twenty-first-century skills for the millions of teachers who work to fulfil the most important role in society of equipping young people to thrive in the world?

2.1.1 Identifying the Problem

Numerous factors that influence teachers' work will be discussed through a systematic literature review and then three studies will highlight the reality of this influence on the wellbeing of teachers. A conceptual framework will be presented that helps us to understand the broader issue of work and wellbeing and makes a projection about the significance of teachers' work on the wellbeing of the profession that includes teachers, non-teaching staff, children and young people, leaders, policymakers, government, parents and carers and the wider community. However, first, we define what we mean by wellbeing and how it applies to teachers in this chapter.

Wellbeing first appeared as a term in the WHO's (1947) constitution and was defined *as a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.* Since the 1960s, there has been a steep increase in scholarly discussions and research regarding wellbeing with over 46,000 articles being published according to a Scopus database search (McCallum et al., 2017). Most of these have occurred in the last 20 years in the healthcare, psychology, business and public sectors and include a myriad of areas such as social and emotional learning, positive psychology, character education and wellbeing education. It has

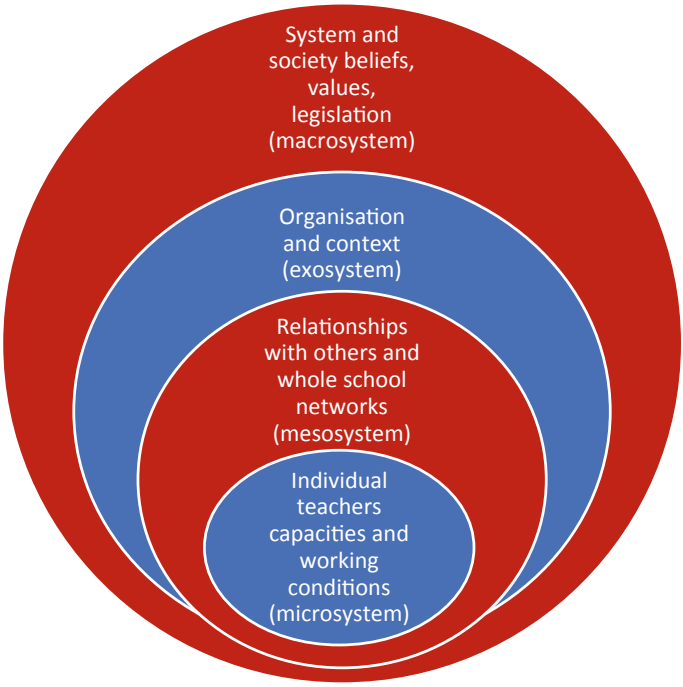

Fig. 2.2 Conceptual framework for teachers' work and wellbeing

been difficult to define but the model proposed by Dodge et al. (2012) is particularly relevant to teachers' work. They describe wellbeing as 'the balance point between an individual's resource pool (psychological, social or physical) and the challenges faced (psychological, social or physical)' (p. 230). Like a seesaw, the challenges can outweigh the available resources, which determine the level of wellbeing. Seligman (2011) has also presented the PERMA model to advocate that wellbeing has five pillars (positive emotion, engagement, relationships, meaning and accomplishment). Huppert and So (2013) coined the term *flourishing* and evidence-based approaches are now dominating with a recent study by Waters and Loton (2019) who proposed a data-driven meta-framework for researchers and practitioners. A search of the literature reveals that few definitions of wellbeing are specific to teachers except for the one by McCallum and Price (2016),

> Wellbeing is diverse and fluid respecting individual, family and community beliefs, values, experiences, culture, opportunities and contexts across time and change. It is something we all aim for, underpinned by positive notions, yet is unique to each of us and provides us with a sense of who we are which needs to be respected (p. 17).

Bronfenbrenner's (1972) ecological framework provides a theoretical structure to the study of teachers' wellbeing and work. Price and McCallum (2015) applied Bronfenbrenner's (1979) ecological model as a conceptual framework (see Fig. 2.2)

to organise the literature, findings and discussion on teachers' work and wellbeing.

The first system, the microsystem, refers specifically to the individual teacher and their relationship with their classroom and school environment and the many factors that influence them. The evolving interaction between the individual (teacher) and their environment is influenced by (teacher) perceptions and capacities, and the way they deal with the environment (Bronfenbrenner, 1979). While the school environment is central to teachers' wellbeing, contexts of family, friends, networks (the mesosystem system) as well as wider organisational, system, societal, environmental and cultural contexts (the exosystem level) influence teachers' work with varying effects. System and societal beliefs, values and legislative factors (the macrosystem level) increasingly influence teachers' wellbeing. The fifth system in the ecological system refers to the timing of events, decisions and actions (the chronosystem level) that may play a pivotal role in influencing teachers' wellbeing. This system has not been included in the conceptual framework for this chapter.

The nested structure of Bronfenbrenner's ecological model (1979) provides a lens for identifying teachers' perceptions of key themes of the environmental interconnectedness with teachers' wellbeing. Teachers operate and interact in numerous microsystems including the school environment, home, community groups, friendships and so forth. A complex interplay across these ecological systems was identified and has both positive and negative influences on teachers' management of their work and overall wellbeing.

In this chapter, Bronfenbrenner's ecological framework (1972) and the work conducted by Price and McCallum (2015), enables a discussion on teachers' work and wellbeing according to (see Fig. 2.2):

1. The capacities and working conditions of individual teachers (microsystem)
2. Relationships with others and whole school networks (mesosystem)
3. Organisation and context (exosystem)
4. System and society beliefs, values and legislation (macrosystem).

2.1.1.1 The Capacities and Working Conditions of Individual Teachers

Aligned with Bronfenbrenner's (1979) ecological model, this first level of the microsystem identifies factors related specifically to the individual teacher and their relationship with the classroom and school environment. The evolving interaction between the individual (teacher) and their environment is influenced by (teacher) perceptions and capacities and the way they deal with the environment (Bronfenbrenner, 1979).

With a plethora of evolving demands on teachers' work that is related to ongoing change, teachers often find themselves performing a multitude of roles—the job has developed beyond that of knowledge generation to encompass the education of the whole child, responding to and developing the whole child, managing behaviour and their socio-emotional needs as well as responding to the growing demands of parents (Guerriero, 2017). Additional roles are often undertaken in excess of classroom teaching, including after school hours commitments, for example, sports

training, school events, school management, parent meetings, professional learning, collaborating with peers and counselling students.

Teachers are required to keep abreast of changes to curriculum and digital technologies and plan around a crowded curriculum, which can mean they are teaching areas or subjects that they were not trained in (Schleicher, 2018). In some sectors, the workload allocations of teachers are inequitable and less experienced teachers are found in the most disadvantaged areas (OECD, 2018). They must demonstrate their effectiveness as teachers (Bajorek, Gulliford, & Taskila, 2014), have positive relationships with students and maintain a positive classroom environment that ensures safe, respectful and supportive conditions for learning (Hamre et al., 2013; Reyes et al., 2012).

Classroom environments are diverse (OECD, 2018; Spilt, Koomen, & Thijs, 2011) and teachers are required to deal with challenging student behaviours, poor student results, poor literacy and numeracy, testing, low academic results, behavioural problems, students with special needs, increased student anxiety and teaching students from various ethnic or refugee backgrounds. Workplace relationships and opportunities can affect the quality of the workplace and working environment (Blazar & Kraft, 2016; Cazes, Hijzen, & Saint-Martin, 2015; Collie, Shapka, & Perry, 2012; Ross, Romer, & Horner, 2012). Job demands (physical, social or organisational) and job resources do not always align (Dodge, Daly, Huyton, & Sanders, 2012). Teachers are affected if there is a lack of resources but conversely job resources can buffer the influence of job demands and diminish the negative impact of student misbehaviour.

Student wellbeing is a growing concern for teachers with the most recent PISA results showing that although Australian students are performing close to the OECD average for mathematical literacy, reading literacy, and scientific literacy (see Fig. 2.3), results in the wellbeing domain identify some serious issues (ACER, 2019). For example, according to the OECD (2019a) report, 23% of students reported being bullied at least a few times a month, on average, across OECD countries; 21% of students had skipped a day of school and 48% of students had arrived late for school in the 2 weeks prior to the PISA test; 67% of students reported being satisfied with their lives, but between 2015 and 2018 the share of satisfied students shrank by five percentage points; more than 80% of students reported sometimes or always feeling happy, cheerful, joyful or lively; and approximately 6% of students reported always feeling sad. In almost every education system, girls expressed greater fear of failure than boys did and this gender gap was considerably wider among top-performing students, and in the majority of school systems, students who expressed a greater fear of failure scored higher in reading, but reported less satisfaction with life (OECD, 2019a, pp. 15–16).

The social–emotional nature of teachers' work is undervalued by many, although teachers are grappling with addressing the expansion of pressures on them (Jennings & Greenberg, 2009; Palomera, Fernández-Berrocal, & Brackett, 2008; Vesely, Saklofske & Leschied, 2013). The influence of these factors on teachers' wellbeing

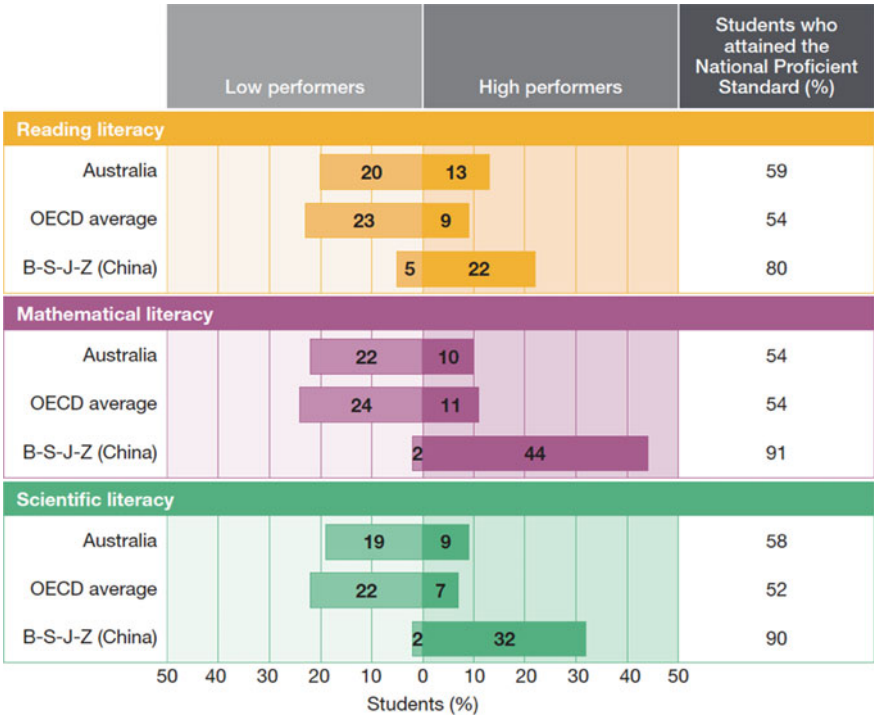

Fig. 2.3 2018 PISA in-brief student performance report. *Source* ACER (2019), p. 6.

questions their professional identity; they can feel challenged by performance evaluations, the perspectives portrayed by media and tensions from having to undertake multiple roles. Performance reviews can provide teachers with valuable feedback to address weaknesses and positively influence job satisfaction and wellbeing (Vanhoof et al., 2014). Yin, Huang and Wang (2016) discussed the importance of trust in colleagues and that teachers were psychologically healthier when appraisals were undertaken. However, many teachers felt additional stress and this added to their cognitive load, resulting in time pressures, long working hours (especially for tasks such as planning lessons, marking, staff meetings and so on), high work intensity, inflexibility in the workplace, work overload on weekends and holidays and extracurricular activities.

Teaching has been identified as one of the most stressful professions (Brown, 2012; De Nobile, 2016; Falecki, 2015; Griva & Joekes, 2003; Kelly & Colquhoun, 2003; Naghieh, Montgomery, Bonell, Thompson & Aber, 2015; Pisanti, Gagliardi, Razzino, & Bertini, 2003; von der Empse, Pendergast, Segool, Saeki, & Ryan, 2016). A summary of the issues is provided by Curry and O'Brien's (2012) study and reinforces that teachers are faced daily with both work-related and institutional stress factors.

2.1.1.2 Relationships with Others and Whole School Networks

The mesosystem of Bronfenbrenner's ecological model refers to relationships with others and those in whole school networks. These can influence teachers' working conditions, the demand for a result-driven performance by teachers and achievement scores (OECD, 2018a, b) as displayed in the release of the 2018 PISA results that showed that Australian student results in mathematics, science and reading were worse than that in the 2015 results.

Stressful work environments result in teachers who are burnt out or worn out, which affects student achievement outcomes (Watt & Richardson, 2013; Rajendran et al. 2020). Teacher's health outcomes have been well documented and allude to stress and burnout, anxiety, ill-being, being overweight, having a lack of motivation, signs of stress and an ageing profession (Klassen & Chiu, 2010; Kyriacou, 1987; McCallum, Price, Graham, & Morrison, 2017). An inadequate balance between job demands and the capacity to respond is a major cause of stress and burnout. One-third of teachers internationally report being stressed (Collie et al., 2012). Day and Qing (2009) found that many teachers' work environments were hostile to their wellbeing. Stress directly influences attrition rates in the teaching profession (Curry & O'Brien, 2012; Hartney, 2016; Pillay, Goddard, & Wilss, 2005). Physical learning environments are sometimes inadequate workplaces for teachers with light, heating/cooling, noise, cleanliness and specialised facilities influencing teacher effectiveness (Kristiansen et al., 2011). There is a mismatch between job demands and resources, which influences the levels of stress and engagement at work by teachers (Dodge et al., 2012; Skaalvik & Slaalvik, 2018).

With recent changes to teachers' work that have a heavy reliance on national testing and curriculum and achievement scores being the measure of success, teachers experience less autonomy in their day-to-day work. They are experiencing less control over decisions regarding their lessons, teaching methods, content and assessments within the limits of the national curriculum and policy (Bakker & Bal, 2010; McCallum et al., 2017). Levels of teacher autonomy are linked to work dissatisfaction and wellbeing. The relationship and demands from leadership (McCallum et al., 2017) can have a positive or deleterious influence on the autonomy of teachers. Supervisory support correlates with increased job satisfaction and reduces the risk of burnout (Bakker & Bal, 2010).

Curry and O'Brien (2012) considered the influence of policy and public debates regarding teachers and identified stressors for teachers to include work-related and institutional factors, schools, school systems being too bureaucratic, expectations to manage student misbehaviour, increased service delivery, fewer resources to do the job, lack of time to plan, increased accountability measures and teachers being excluded from policymaking.

School-based operations and arrangements influence school effectiveness (Bricheno, Brown, & Lubansky, 2009). Schools that lack attractiveness as a workplace have a negative influence (Heidmets & Liik, 2014). Burns and Machin (2013) also found that workload, student behaviour, class sizes and collegial relationships have negative effects on teachers' wellbeing. When the school climate or culture is

negative, it affects teachers' health and wellbeing (Burns & Machin, 2013; Salimirad & Srimathi, 2016; Yin et al., 2016; Zhu, Devos, & Li, 2011). However, teachers who perceive school culture positively have been shown to have higher levels of job satisfaction (Wong & Zhang, 2014), with Seligman (2011) claiming that the emotional nature of the work can be enhanced by improving the school environment and health protection of the teachers.

2.1.1.3 Organisation and Context

The nature of teaching as a profession has its flaws, which are described in the exosystem of Bronfenbrenner's ecosystem, and relates to teaching as an organisation that takes context into account. Recently, we have seen a decline in students applying for teaching degrees and, in Australia, this has dropped by about 18% in the last 2 years (ACDE, 2019). For some, a career in teaching is less attractive and satisfying than it once was, which has resulted in less motivation to undertake the job and a lower commitment once in the job (Collie et al., 2012). Many university graduates do not obtain permanent work postgraduation and their employment is heavily casualised with poor salaries and limited job security (Britton & Propper, 2016; Cazes et al., 2015; Forcella et al. 2009; Helliwell & Huang, 2011; Hendricks, 2015. This can result in high teacher turnover (Hendricks, 2015) and absenteeism, which affects overall school performance resulting in less commitment to the organisation. Intentions to leave due to stress and lack of motivation have been reported (Tehseen & Ul Hadi, 2015). Attrition rates in some countries indicate a loss of 40%–50% in the 5 years post-entry (Gallant & Riley, 2014).

Some environments have particular needs, for example, there are additional stressors on teachers in rural places where the school is often perceived as central to the town and its livelihood (McCallum & Hazel, 2016). Countries that have large hinterlands such as Australia, Canada and China experience difficulties attracting teachers to stay. Students often have specific needs and sometimes show lower literacy and numeracy scores than their city counterparts. Rural towns experience life events such as floods, fires and droughts and higher reports of mental health issues all influence the communities in which the schools operate. Unfortunately, there can be lower levels of quality as teachers increasingly teach in subjects that they are not trained for, and there is a higher turnover with less experienced teachers making up the majority of the workforce profiles.

For those that stay in the teaching profession, there can be unstable career structures and a lack of promotion, which results in teachers leaving the profession early or feeling stressed. Therefore, they are not attracted to leadership roles (OECD, 2018). Teachers need to be acknowledged and rewarded for their work and there needs to be a career structure in place that recognises longevity with attractive remuneration that is commensurate with other professions. Professional development opportunities are a job resource and participation enables teachers to be informed of the latest

developments, increase their knowledge and enhance the skills that can advance their work. These are all linked to work satisfaction and wellbeing.

There is high accountability of teachers for student outcomes and organisations need to build a sense of trust in teachers to meet organisational and community expectations as well as student outcomes (OECD, 2013, 2017). Teachers are having to teach skills and competencies specifically related to academic, social, emotional and ethical behaviours (Collie et al., 2012) and encourage engagement and social responsibility by responding to different student needs. Work environments, unreasonable expectations of school communities and socio-economic challenges influence the emotional illness. Students, school administrators, parents and departmental organisations all influence the emotional vulnerability of teachers (Daniels & Strauss, 2010). Ross et al. (2012) reported that teachers experience high levels of accountability within-school contexts and organisations.

2.1.1.4 System and Society Beliefs, and Values and Legislation

In the profession at a global level, there are examples of rapid reforms, reorganisations, resource re-allocations, social and productive change and internal and external demands on teachers' work (Gozzoli, Frascaroli & D'Angelo, 2015). Organisational change is associated with teacher exhaustion and burnout (Burns & Machin, 2013) and, together with high societal expectations, media negativity and increased legislation, these demonstrate elements of the Bronfenbrenner's macrosystem.

Global stressors influence teachers and school systems. Examples include terrorist attacks, natural disasters, the growing disparity in socio-economic strata, the changing demographics of the population and legal mandates or federal policy that influence the lives of students and classroom teaching protocols. Therefore, political, social and systemic changes may also contribute to increased levels of stress experienced by teachers in and out of work (Curry & O'Brien, 2012, p. 178). In the USA, heavy investments in accountability measures and high-stakes testing (Berryhill, Linney, & Fromewick, 2009) are evident and these are reflected worldwide.

This subsection has highlighted some of the most significant influences on teachers' work and demonstrated the complexity and multifaceted nature of the profession. It influences teachers personally and professionally through interactions in the classroom, with peers, parents, leadership and the broader community. The profession is showing strain from entry to teacher education programmes, exit and transition to the profession and sustainability of employment. The following subsections will outline the research focus for case studies that will explore teachers' wellbeing in three settings.

2.2 Research Questions

RQ1: What are the current perceptions of teachers' wellbeing (how do they measure it)?
RQ2: How do teachers define wellbeing?
RQ3: What factors do teachers think influence their wellbeing, i.e. a sense of autonomy, leadership, workplace, and so on?

2.3 Method and Research Design

Three case studies are discussed in this chapter (see Table 2.1). An appreciative study as developed by Cooperrider and Whitney (2001), focusing on the participants' strengths, was undertaken using mixed methods to gain quantitative and qualitative responses to the levels and factors affecting teacher wellbeing (see Fig. 2.4). After a literature review of the field, a qualitative questionnaire will be developed on the experiences of pre-service teachers' attitudes towards teacher efficacy. Appreciative inquiry investigates the positive core of an individual, group or system. It leaves behind 'deficit-oriented' methodologies and concentrates on what is working well (strengths) at an institutional, group and personal levels.

Table 2.1 Case study details

Case Study	Type	Participants	Ethics
One	Private day and boarding school for 807 boys	183 employees (100% response rate, 9 responses were incomplete) 53% female 39% male 8% did not identify 48% teachers 21% leaders 31% non-teaching	H-2018-275
Two	Association of Independent Schools. 3000 teachers invited. Metropolitan, regional and rural participants. Co-educational and single-sex schools	806 employees 75% females 24% males 1% did not identify 81% teachers 19% leaders	H-2017-202
Three	Co-educational with two single-sex campuses	144 employees 78% female 21% male 1% did not identify 52% teachers 25% leaders 25% non-teaching	H-2019-120

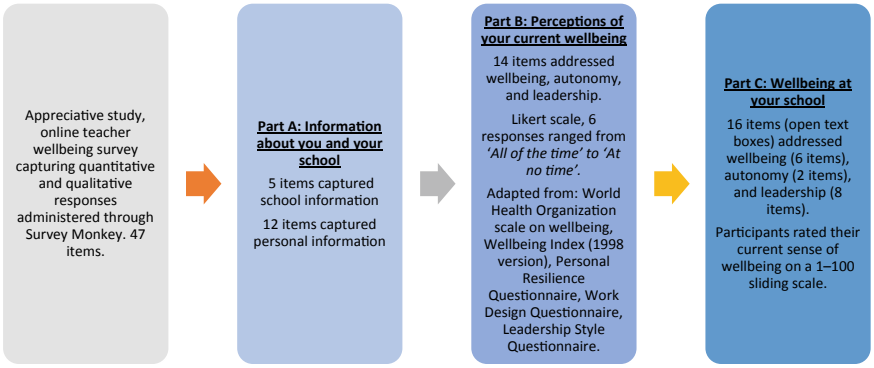

Fig. 2.4 Research methodology

The survey was built using Survey Monkey. All questions were compulsory to promote a complete dataset. The teacher wellbeing survey integrated items adapted from published wellbeing scales (see Fig. 2.4).

The 47-item survey was divided into three parts:

(1) *Part A: Information about you and your school.*

Five items captured school information data including location, school type, religion, school gender and approximate enrolment. Twelve items captured personal information including gender, main role at the school, current teaching level, total years of teaching experience, teaching experience at current school, current employment (i.e. full-time, part-time, on leave), current employment status (permanent, contract, casual), length of the contract, highest qualification and experience in wellbeing professional learning. For those who identified attendance in professional learning, they were asked how valuable this was and given the opportunity to comment about why it was valuable in an open text box.

(2) *Part B: Perceptions of your current wellbeing.*

A total of 14 items addressed wellbeing (5 items), autonomy (3 items) and leadership (6 items). A Likert scale of six responses ranged from 'All of the time', 'Most of the time', 'More than half the time', 'Less than half the time', 'Some of the time' and 'At no time'. The wellbeing items were adapted from the original World Health Organization (WHO) scale on wellbeing WHO (Five) Wellbeing Index (1998 version), Psychiatric Research Unit, WHO Collaborating Centre for Mental Health. The original 6-point scale was retained. To measure current wellbeing, the wording of each item was adapted. The first two autonomy items were adopted from the Personal Resilience Questionnaire, while the third item was selected from the Work Design Questionnaire.

The majority of the leadership items were not directly drawn from published scales rather they were drawn from the research literature. Items 12 and 13 were adapted from the Leadership-Style Questionnaire: questions 6 and 19. While the limitations

of construct validity are recognised for not using the full scales, for the scope of this study and to support teacher wellbeing in responding to a relatively short survey, items were purposefully selected.

(3) *Part C: Wellbeing at your school.*

Sixteen items (predominantly open text boxes) addressed wellbeing (6 items), autonomy (2 items) and leadership (8 items). Within these questions, item 2 asked participants to rate their current sense of wellbeing on a 1–100 sliding scale.

An Information Sheet was developed for participants and consent was obtained. Ethics approval was obtained from the University of Adelaide (see Table 2.1). Dissemination methods included:

(a) Case Study One was through the school's email system with the consent form and a sheet of instructions. Data were collected from 7 to 10 December 2018. The survey was digitally completed.
(b) Case Study Two was disseminated through the sector's communication channels to a random sample of 3000 members selected from the total population. These members were emailed an invitation to complete the survey from 18 November to 10 December, 2017. Additional respondents were recruited through social media channels including Twitter, Facebook and the sector's Education Research website landing page.
(c) Case Study Three invited volunteers for the study via the school's email from July 15 to August 4, 2019. Employee consent was implied when participants submitted the survey. If employees did not wish to participate, they closed the survey window and were automatically led out of the survey.

For all case studies, the participants were free to withdraw from the project within a week of submitting responses without explanation or prejudice and to withdraw any unprocessed data previously supplied. All data were treated confidentially. There were no individual reports generated and the researchers could not identify individual employees.

All results generated are descriptive statistics (e.g. frequencies). These are displayed via bar plots and sunburst charts. The distributions of numeric data and averages are displayed via boxplots. The studies were cross-sectional in that participants completed the survey once (i.e. they were measured at a given point in time). Data were collected in a secure University of Adelaide portal for analysis purposes. A mixed-methods approach was applied to the quantitative (i.e. ratings) and qualitative (i.e. open-ended questions) data. Categorical questions (e.g. years of teaching experience) were answered via multiple-choice questions and items related to the perception of wellbeing were responded to via *n*-point Likert scales. Some questions required open-ended answers (e.g. 'how would you define wellbeing?').

2.4 Results and Discussion

The demographic data of the participants are provided in Table 2.1 for all three case studies.

The results and subsequent discussion will be presented for each case study based on the three themes identified by the research questions in Sect. 1.2. The three sections are (1) Teachers' definitions of wellbeing; (2) Perceptions of teachers' wellbeing; and, (3) Factors influencing teachers' wellbeing.

2.4.1 Teachers' Definitions of Wellbeing

In Case Study One, in this chapter, 62% of education employees agreed that wellbeing was a priority at their school and keywords are represented in the word cloud (Fig. 2.5) with the bold terms attracting 42 responses and the smallest words attracting only three responses. In Case Study Three, 56% of respondents agreed that wellbeing was a priority at their site (see Table 2.2).

For this book chapter, we settled on a definition of teacher wellbeing as the one described by McCallum and Price (2016), but we acknowledge the difficulties with arriving at one clear definition (Collie et al., 2012; Dodge et al., 2012; McCallum et al., 2017; Van Horn, Taris, Schaufeli, & Schreurs, 2004).

Fig. 2.5 Keywords associated with the definitions of wellbeing (Case Study One)

Table 2.2 Wellbeing results

	Teacher wellbeing was a priority at my school (%)	Mean wellbeing (scale of 0–10)	Highest level of wellbeing according to years of experience
Case study one	62	3.5	0–5 yrs (3.2)
Case study two	72	7.5	16 + yrs (4.4)
Case study three	56	2.7	16 + yrs (3.5)

2.4.2 *Perceptions of Teachers' Wellbeing*

Results related to wellbeing from the three case study sites are detailed in Table 2.2 and show that where the school prioritises wellbeing, there is a higher level of wellbeing for teachers. Case Study Two showed the highest result of the three case study schools. Years of teaching experience are mixed in the three case study schools and recorded different results. Case Study One had a well-developed wellbeing strategy in place with dedicated executive roles for student and staff wellbeing. They had an induction programme for new staff, staff wellbeing programmes and initiatives that supported their workload and heightened awareness across the school. They recorded the highest level of wellbeing for the early career teachers who were 0–5 years post-graduates. The two other case study schools indicated that it was teachers with more years of experience that showed a higher level of wellbeing.

Table 2.1 outlined that Case Study One was a single-sex (boys) college with 183 employees, 53% female respondents and 48% were teaching staff. The overall ratings in the current wellbeing scale indicated (Fig. 2.6) that most respondents (43.2%) rated their current wellbeing very close to 'high' (modal value = 4). Case Study Two showed the highest level of wellbeing when teachers felt that the school where they worked prioritised their wellbeing and where it was explicitly outlined in the strategic plan.

In Case Study One, teachers with a teaching experience of 0–5 years were rated the highest wellbeing out of the three categories for years of teaching experience on

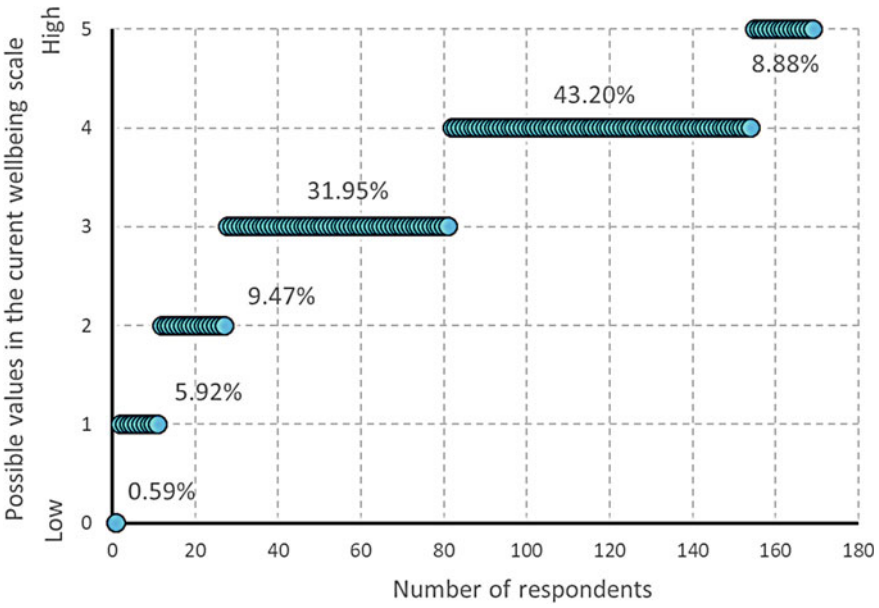

Fig. 2.6 Overall ratings in the current wellbeing scale (Case Study One)

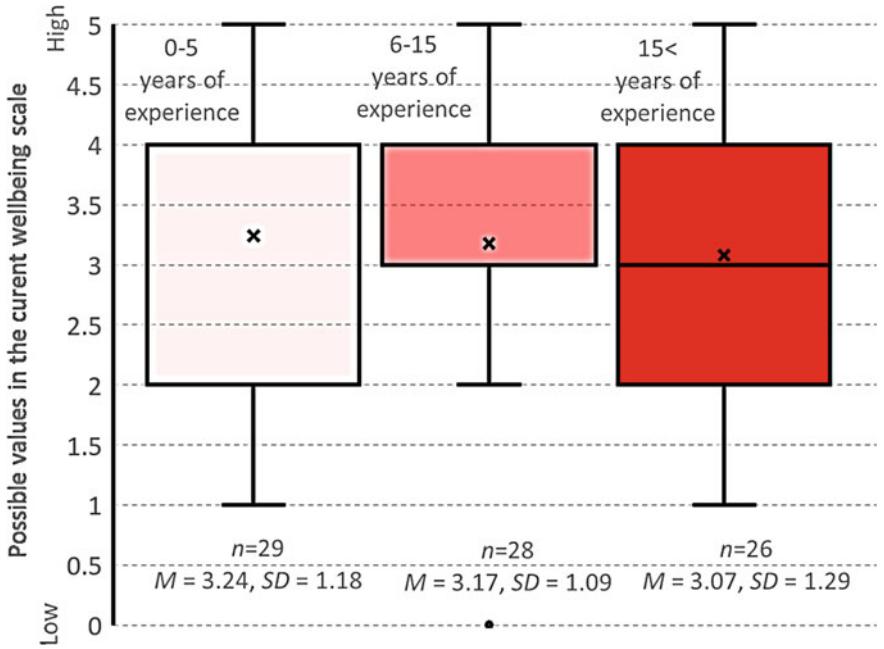

Fig. 2.7 Mean wellbeing scores according to years of experience (Case Study One)

a 5-point scale with the mean level of current wellbeing at 3.24 (SD = 0.81) (see Fig. 2.7). Case Studies Two and Three recorded that teachers with longer teaching experience had the highest level of wellbeing at 4.4 and 3.5, respectively, indicating that experience was valuable for managing one's work/life balance (see Fig. 2.8).

Part B of the instrument collected data on the perceptions of teachers' wellbeing and included 12 questions about current levels of wellbeing and asked teachers to indicate responses on a Likert scale from 'At no time' to 'All of the time'. Teachers responded predominantly on the 'Most of the time' point and all three case study sites recorded similar results (Table 2.3). Responses showed that for all three case study sites, teachers were not physically energised or active in their approach to work. However, teachers had worked out strategies to help them balance workload and wellbeing by drawing on their personal and professional skill set and experiences. One participant in Case Study Three summed up her perceptions of teachers' work and wellbeing as follows:

I have a lot of control over my wellbeing but not if I wish to be a teacher as there are too many task masters. Right now, I can get orders from as many as 7 executive and lead staff - and all ask for different things on different timelines at the same time. Any one is reasonable, but the combination is hectic. The number of government bodies all create a weighted blanket of demands and timelines that the feeble wellbeing meeting once a year that says look after yourself just does not address.

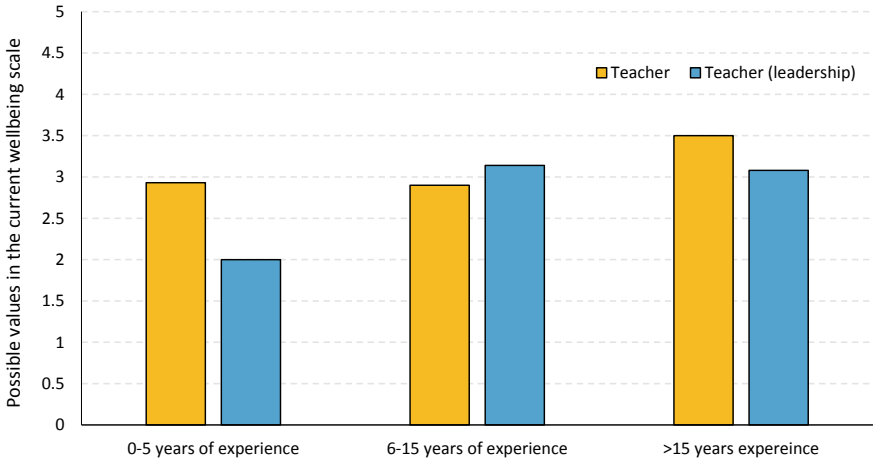

Fig. 2.8 Average current wellbeing for teachers (yellow) and teachers with a leadership role (blue) according to years of teaching experience (Case Study Three)

Table 2.3 Responses to perceptions of wellbeing

	Lowest recorded perceptions	Highest recorded perceptions
Case study one	I feel calm and relaxed	I play to and make the most of my strengths
Case study two	I feel calm and relaxed I feel active and vigorous I wake up feeling fresh and rested	I play to and make the most of my strengths
Case study three	I wake up feeling fresh and rested	I play to and make the most of my strengths I am good at recognising the things I can influence and the things I can't

2.4.3 Factors that Influence Teachers' Wellbeing

Responses to the question *'What are the key factors that challenge your wellbeing'* provided extensive responses, which were summarised into the following themes:

- Receiving work with short deadlines when they could have been avoided
- Extreme time pressures, causing work to flow into most weeknights and weekends
- Lack of understanding of the role, feeling undervalued, conflict situations
- Devaluing of discipline/subject area
- An exuberant amount of paperwork with an inadequate amount of time to complete it
- Workflow and the never-ending stream of tasks that need actioning

- Draft marking—The turnaround is incredibly short but still requires meaningful and helpful recommendations to students to help them progress. It's barely finished, and the final assessments come flooding in, and I am an organised person!

Participants in Case Study One articulated aspect of their work that impacted on their wellbeing:

Feeling unappreciated or undervalued at work. Feeling pressure to constantly exceed expectations in order to keep up with colleagues. Job insecurity. Having to be away from home for work (e.g. late hours, weekend work commitments, evening work commitments.)

Massive increase in workload; feeling that there literally is not enough prep time to accomplish all necessary meeting, planning, clean-up and other administrative work. Feeling like the only option for getting caught up is to use weekend time to do work, which also impact wellbeing, as it takes limited time away from family. Lack of oversight and planning or understanding by leadership at work, too much to do in too short a timeline, cultural issues around student behaviour and professional practices. Coping with being effective at work while dealing with challenges in other aspects of my life. Rate and pace of change at work and in society.

Teachers in Case Study Two had mixed experiences in relation to the amount of autonomy they felt they had over the management of their workload and this depended on two factors, personal and professional. Personal factors related to having a work/life balance and juggling the demands of employment, life administration and family. For example, one participant stated, 'I think I have quite a lot of control over my wellbeing, as long as I don't allow outside factors to get the better of me, e.g. work pressure can sometimes affect my mental wellbeing'.

Professional factors related more closely to the wider demands of the profession, school culture and its management/organisation. When asked about the amount of control over work, responses included,

Increasingly less. The churn of primary syllabus documents coming along with mandatory WWC checks, mandatory registration and the requirement to jump through hoops for performance-based pay essentially represents a huge money grab from three separate entities and more compliance for teachers. I have some control over my workflow, but when I am overloaded with coordination jobs that there is insufficient loading for, and when extra high maintenance students are in my classes, my work becomes stressful. I think with allocations and timetables being decided by people above me, and the demand to be on site for the full 8 h of the day whether I am teaching or not, there is a very paternalistic attitude to my work! So much of what I do is decided by others that control is not really what I have over my work. I merely have the control over how well I do it in the time available.

Teachers varied in how they managed autonomy to sustain a sense of wellbeing and most seemed to be doing ok, but it was evident that the continual balance was at times difficult. For example, all of it - I am in control of my wellbeing and I know I have the resources to support myself through difficult times. Stress, feelings of being overwhelmed and 'under the pump' are part of my job, but I am able to reason with myself and know that some things are not inadequacies or a result of being

incompetent, but that I might lack knowledge or experience. I see everything as a learning opportunity.

However, there were accounts of extreme stress:

When I am in a fairly good place, I have the presence of mind to have a fair degree over my wellbeing. When I am in a very bad place, like I was this time last year, I had very little control. My normal state was filled with panic attacks, the inability to relate to even my closest friends and family, suicidal thoughts and an overwhelming desire to leave teaching.

Participants' attendance in professional learning on wellbeing had a significant main effect. Having attended or not attended courses on wellbeing was associated with high levels of autonomy. However, those teachers who attended were more consistent in their level of autonomy, that is, in recognising things, they could influence, make the most of their strengths and provide the opportunity to exercise autonomy within their daily work.

Teachers in Case Study Three suggested several strategies to counter many of the factors that influence their wellbeing and these fell into the following categories supported by teacher quotes from the qualitative data:

1. Collegiality: *Talking to trusted colleagues; keep active. plan well, work hard/efficiently. Seek advice from peers. Productive teamwork. Use inspiring colleagues. Set goals that benefit students.*
2. Structured personal support: *Support network and counselling, I leave my laptop on my desk when I am in the staff room having my M Tea and lunch, I arrive early each day and leave in the afternoon early enough to pick up my children to try to establish more of a work/life balance.*
3. Health: *Lots of physical activity outside of work; exercise; No work while my toddler is awake, managing stress, physical activity; exercise, talking to others, music; Physical exercise, playing a team sport and prioritising family on weekends; Self-awareness of negative thought patterns, diet, exercise, building positive relationships.*
4. Social/emotional activities: *Connect with people, use of music and candles, acknowledging the good things; positive self-talk; consult colleagues; talk with spouse; Try and not take work home, talk to someone about any issues, eat healthy; maintaining a work life balance in and out of work, meticulous time management to address the challenge of time constraints.*
5. Leadership*: Regular meetings with leadership, mixing with staff and leadership, establishing relationships, positive communication, show casing positive experiences.*
6. Spiritual: *To accept that there is always good with the bad and that most people don't intentionally want to make my life at school harder; Mindfulness; Positive and cheerful outlook, spending time in nature, having a sense of gratitude, spending time with God, spending time with friends enjoying each other's company, supporting the local community, supporting family.*

An overall concerning response to managing one's wellbeing is described here:

> It hasn't been good - basically, I've just responded to everything thrown at me. More recently I have started listening and responding to my body's warning signs. If I feel unwell, I stay home, whereas previously I would soldier on and become more physically and mentally drained.

2.5 Concluding Points

Findings from the Case Studies reported on in this chapter align with themes found in the wellbeing literature including the 2020 OECD Education Working Paper No.213 *Teachers' well-being: A framework for data collection and analysis* (2020a). There were four main points:

1. Most teachers articulated an understanding about what wellbeing meant and thought that the school where they worked saw staff wellbeing as a priority. Where wellbeing was prioritised in the school, there was a higher level of teacher wellbeing recorded.
2. Teachers with more years of experience have a higher level of wellbeing.
3. Most teachers in these studies could demonstrate they had strategies in place to manage their wellbeing when it was challenged.
4. Factors that challenged the wellbeing of teachers in these case studies were commensurate with what is found in the literature. Three main areas that contributed to adverse feelings of wellbeing were teachers' sense of autonomy over their work; feelings of being under-valued; and, the intensity of administrative tasks associated with teachers' work.

Using Bronfenbrenner's ecosystem model (1979) to structure the discussion has helped to understand teachers' work and how the traditional role of knowledge generation has evolved through the twenty-first century to be much more complex and multifaceted. It appears that teachers' work is dimensional and includes cognitive, emotional, physical and social factors. Earlier in this chapter, Seldon (2018) claimed that there is no more important issue facing education, or humanity at large than the fast-approaching revolution. He suggests that … *we need to use AI well to retain the best of the Education Revolution benefits – the social experience, positive interactions with teachers, stimulating careers for teachers, academic ambition* (p. 174), and Mostafa and Pal (2018) purport that teachers with high levels of wellbeing report higher self-efficacy and job satisfaction, are more motivated at work and will remain in the profession. These views provide a futuristic model to progress the work of teachers and teaching, as well as catering to teachers' wellbeing.

For example, the Fourth Education Revolution according to Seldon (2018), is predicted to have schools without conventional classrooms, with students learning through personalised work plans. He suggests that if AI is used well, the best of the Third Education Revolution will benefit—he's referring to the social experience, positive interactions with staff, stimulating careers for teachers and academic ambition and seriousness. Conversely, the five problems of the Third Education Revolution, referred to as the factory system, will disappear—he's referring to gross social

unfairness, the factory line, teachers' heavy administration workload, the narrow range of student abilities and student homogeneity (Seldon 2018, p. 174). This will allow teachers to do their job, thus freeing up time to interact with students, classrooms will be more interactive and student-centred, and there will be less time spent grading and more time spent facilitating self-directed learning.

This chapter acknowledges that teachers are the most important in-school factor for student satisfaction, achievement and happiness (Darling-Hammond, 2012; Hattie, 2019; McCallum et al., 2017). The case studies reported here shared the view that wellbeing for teachers was higher when the schools valued general student and staff wellbeing when teachers had autonomy over their work, where leadership supported teachers in their decision-making and control over their work and where professional learning on wellbeing was part of the regular school commitment. This is evident in some countries, e.g. in Flanders, teachers' wellbeing is high owing to support from principals and colleagues and the inclusion of professional learning, which are specifically linked to school culture (Aelterman et al., 2007).

However, Daniels and Strauss (2010) suggested that schools as workplaces require transformation if teachers are to perform their work effectively. The stressors on teachers are evident and directly related to the quality of teaching. Hartney's (2016) study focused on how to enhance teaching quality and effectiveness by providing teachers with professional learning in stress management, specific to the stressors of teaching. She found existing research that clearly identified key stressors for teachers and evidence-based stress management approaches that are effective in mitigating teacher stress and improving teaching quality. However, there are specific groups of teachers who we know have existing levels of challenge and experience heightened levels of stress and burnout. That is, newly appointed teachers in rural areas where there are large proportions of Indigenous students.

This chapter has highlighted a link between teachers' work, their wellbeing and quality teaching. Emerging research must value wellbeing education and happiness in initial teacher education (White & McCallum, 2019) and school sites (Sachs, 2019; White & Kern, 2018). To conclude, the author would like to recognise that the WEF is the International Organization for Public-Private Cooperation and has three inspiring lessons on happiness from countries worldwide that should recognise the value of teachers' work:

1. In 1948, Costa Rico abolished its military to spend more money on its people.

   Now it has higher levels of wellbeing than some of the richest nations … such as the UK and the US.

   Despite its modest economy.

   In 2017, it invested 7.4% of its GDP in education. Compared to the world average of 4.8% in 2015.

   Source: Happy Planet Index

2. Bhutan rejected GDP as the only measure of progress in the 1970s.

   Designing a Gross National Happiness Index instead.

   Source: The Guardian.

Measuring prosperity according to the happiness of its people.
And the health of its environment.
To ensure the small nation develops sustainability.
Source: Oxford Poverty and Human.

3. NZ's latest budget is focussed on raising people's wellbeing.

Earmarking billions for mental health services.
And for tackling child poverty and family violence.
The government wants its policies to have a long-term impact on citizens' happiness.
Rather than promote 'growth for growths sake'.
Source: NZ Government.
Source: wef.ch/watch.

What is your country doing to boost wellbeing, to value teachers and the importance of their work on helping develop future generations of children and young people for work that we do not yet know exists?

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Chapter 3
Transforming Higher Education Teaching for Twenty-First-Century Skills

Linda Westphalen

Abstract Using the critical lens of Paulo Freire (1921–1997), this chapter explored the dual transformational and standardising imperatives of tertiary education, focusing on teacher education. It proposed that initial teacher educators should reconsider the process of creating teachers and, by implication, other graduates, by engagement with relational agency, a human-focused understanding of the social, cognitive and emotional connections between teachers and learners. The chapter begins by considering the processes by which teachers are accredited in Australia, suggesting that a reductive emphasis on standards is insufficient for creating teachers as relational agents who must address the 'inertia' outlined by the World Economic Forum (WEF, 2017). It then locates relational agency in the discourse of the teacher education and twenty-first-century skills. The chapter concludes by outlining, in relation to the WEF's three interconnected features stymying the 'development and deployment of talent', strategies for reconsidering teacher education and proposing that relational agency be further explored in relation to teacher education and tertiary education more broadly.

Keywords Twenty-first-century learning · Education policy · Higher education · Professional development of educators · Teacher education

3.1 Introduction

The Future, Relational Agency, and University Educators: Paulo Freire as a Critical Lens for Exploring Teacher Accreditation

Universities in Australia are charged with providing their graduates with the knowledge, skills and competencies for employment in a transformational, yet nebulous, context. This contention is supported by the WEF, which indicates a significant need to address the ways that education is constructed within social, political and economic systems. The WEF (2017, p. 5) proposes that

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> Three key interconnected features affect how talent is developed and deployed in the world—today and in the future—across the life cycle of an individual and, in the aggregate, entire populations:
>
> First, technology and globalisation are significantly shifting business models in all sectors, increasing the pace of change in job destruction and job creation—including new forms of work—as well as skills churn within existing jobs. …
>
> Second, education and training systems, having remained largely static and underinvested in for decades, are largely inadequate for these new needs. Some studies suggest that 65% of children entering primary school today will have jobs that do not yet exist and for which their education will fail to prepare them…
>
> Third, outdated but prevailing cultural norms and institutional inertia create roadblocks….

A common and related trope is that we are teaching students for multiple 'portfolio careers' (Owen, 2017, p. 3). University educators have a difficult task—they are bound to prepare students for 'new forms of work'—at the same time as the occupations themselves are still largely unknown. Educational outcomes aligned with graduates' abilities and skills for employment need to be enhanced, but universities must do so from a position of stasis, checked by a lack of funding, as well as archaic structures and attitudes. Given this tension, universities have no choice but to foster skills identified as critical to employability. But what skills? Clearly graduates need to have the agility to change jobs as they choose and as is demanded by new labour markets (WEF, 2017, p. 5). Clearly too educational institutions, including, but not limited to universities, need to be empowered to critically review their own leadership in teaching and learning, and consider new and more agile ways to address change.

An additional tension is the neo-liberal push for universities in Australia to pay their way (the current link between enrolment numbers and tertiary funding is an indicator of this: Performance-based funding for the Commonwealth Grant Scheme, 2019), at the same time that they need to creatively address the economic demands of an employment market characterised by casualisation and uncertainty. Governments at federal and state levels, businesses, accrediting bodies and students all require universities to qualify people for professions and, in teacher education, as with many other occupations, this is against an array of conforming accreditation standards. Are universities 'static and underinvested' (WEF, 2017, p. 5) providing education students with learning environments that foster their skills for both formal accreditation *and* for creatively addressing their future career mobility?

Tensions between different conceptions of the purpose of higher education are increasingly the focus of broader public discussion, some of which is focused on career mobility and the purpose of the university. In *The Australian* newspaper on 11 September 2019, the Chief Executive of the Independent Tertiary Education Council Australia, Troy Williams, argued that higher education and vocational training needed to be integrated to 'enable workers to move seamlessly' from one to the other 'throughout their working lives'(Williams, 2019, p. 27). He contended that this was because 'those entering the workforce today are likely to have three or four careers' and that this integration would mean 'less red tape, producing cost savings that can be reinvested to provide students and their employers with quality outcomes' (Williams, 2019, p. 27).

Three weeks later, Madeleine Beekman and Ofer Gal, both council members of the University of Sydney Association of Professors, argued for a more distinct separation between tertiary education and vocational training, where the former is for 'students who want to pursue knowledge for knowledge's sake' and the latter is for 'high quality professional training' (Beekman & Gal, 2019, p. 28). Bemoaning the Australian Federal Government's funding model based on student numbers, their experiences, and graduate outcomes as 'performance measures', Beekman and Gal contended that this model erodes the quality and exclusivity of tertiary education, forcing graduates to 'add more and more to their resume to make them competitive in the job market' (p. 28).

This tension between different conceptions of the purpose of education is not new. Richard Shaull, in his foreword introducing the work of Paulo Freire in 1971, noted that

> There's no such thing as a *neutral* education process. Education either functions as an instrument which is used to facilitate the integration of the younger generation into the logic of the present system and bring about conformity to it, or it becomes… the means by which… men and women deal critically and creatively with reality and discover how to participate in the transformation of their world (p. 15).

While Shaull's 'either/or' argument is problematic, there is a dichotomy evident in the demands that educators at all levels teach students to both integrate and conform, as well as critically and creatively transform. How does a teacher or a teacher educator be at the same time 'orthodox' and 'heretical' except, perhaps, strategically within the narrow bounds of policy and accreditation or in collusion with their students?

Using the critical lens of Paulo Freire (1921–1997), this chapter explores the dual transformational and standardising imperatives of tertiary education, focusing on teacher education. It proposes that initial teacher educators should reconsider the process of creating teachers and, by implication, other graduates, by engagement with relational agency, a human-focused understanding of the social, and cognitive and emotional connections between teachers and learners. The chapter begins by considering the processes by which teachers are accredited in Australia, suggesting that a reductive emphasis on standards is insufficient for creating teachers as relational agents who must address the 'inertia' outlined by the WEF (2017). It then locates relational agency in the discourse of the teacher education and twenty-first-century skills. The chapter concludes by outlining, in relation to the WEF's three interconnected features stymying the 'development and deployment of talent', strategies for reconsidering teacher education and proposing that relational agency is further explored concerning teacher education and tertiary education more broadly.

3.2 Conflicting Demands: Standardisation, Specialisation and Personalisation

In 2014, the Teacher Education Ministerial Advisory Group (TEMAG) was established to 'advise the Government on how teacher education courses could better ensure new teachers have the right mix of academic and practical skills needed for the classroom' (Australian Government Department for Education, 2019). In a subsequent report, TEMAG (2015) advised that 'there is significant public concern over the quality of ITE in Australia' (p. viii). 'Quality' discourses then frame much of the rationale behind the establishment of the Australian Institute for Teaching and School Leadership (AITSL) and the escalating accreditation processes ITE providers and PSTs must undergo to practice their respective professions (Churchward & Willis, 2019, p. 252–253). While a highly qualified teaching cohort is certainly desirable, the focus on *teacher* quality and not *teaching* quality (Darling-Hammond et al., 2017) embodies 'quality' in the teachers themselves, rather than in their practices, and narrowly 'quantifies' teachers' work (Mockler, 2013). Mockler continues

> Visions of actual quality in education rely on an understanding that as a human and messy business one size never fits all, and this works at cross purposes with the neoliberal desire to catalogue and standardise practice (2013, p. 37).

Churchward and Willis (2019) expand on Mockler to assert that 'measurable, standardized technical and procedural processes… distract from the complexity, variety and extent of practices that broadly define good teaching' (p. 253).

The process of 'credentialising' teachers is not simple. Even a cursory review of the qualification process for teachers in Australia reads like a 'measurable, standardized, technical and procedural' (Churchward & Willis, 2019, p. 253) checklist. In 2020, to become a teacher in Australia, a student has to apply and be admitted to a programme of study with an ITE provider, usually but not exclusively a university, which has itself undergone accreditation with the relevant state-based authority, which administers the policies and procedures established by the national regulator, the AITSL. In South Australia, this is the Teachers' Registration Board of South Australia (TRBSA). ITE providers must, as they did for decades under the previous decentralised system, accredit each programme of study, reaccredit every five years, and notify AITSL annually of changes to the programme. In this accreditation, all aspects of teaching are accounted for, e.g. content knowledge, pedagogy, assessment, alignment, practicum and so on, and the accreditation is, as it is for teachers, against a checklist of standards. The ITE provider must demonstrate to a panel of assessors where and when each standard is taught, practised and assessed. Those who teach in the programme must also be recognised as being adequately qualified. Students are mostly selected on Australian Tertiary Admissions Rank or Grade Point Average and must also submit a Teaching Capabilities Statement (TCS), which is a non-academic entry requirement and a subjective assessment of 'affective suitability' of the applicant for the profession. Ironically, because of the number of applicants to be evaluated, the TCS is often assessed by a computer algorithm. Students must, during the course of their studies, show their knowledge of and compliance with

the graduate level of the 37 focus areas of the Australian Professional Standards for Teachers (APST), pass their professional placements and complete a Teaching Performance Assessment (TPA), in which they demonstrate that their teaching while on placement has had a positive influence on school student learning. They must also pass the Literacy and Numeracy Tests for ITE, a criminal history check (Working With Children Check), and complete training relating to recognising and reporting child abuse and neglect (in South Australia this is 'Responding to Abuse and Neglect, Education and Care'). They can have additional requirements for registration, such as a first aid certificate and training in Child Protection Curriculum, which are required for teaching in some sectors. Graduate teachers can then register with the relevant authority (for example, the TRBSA) in the state in which they intend to teach. To maintain their registration, ongoing knowledge of the 'proficient' level of the APST, professional learning and compliance with all other aspects of policy and legislation are required. Arguably, teacher education providers, pre-service teaching students and teachers are scrutinised and monitored for conformity to accreditation standards to a degree not experienced in Australia before.[1]

A teacher is a specialist professional in a complex role, one that pivotally requires social interactions with others: students primarily, but also their carers/parents, other professionals such as fellow teachers and administrators, and so on. An additional consideration, and one that is cursorily recognised in the selection process of teacher education students relating to the TCS, is that a teacher's role is inextricably linked to fundamental human qualities, in particular agency and the ability to communicate, build rapport and connect emotionally with others. Many researchers have indicated that teaching is as much a marker of personal human identity as it is a professional one (Mockler, 2013; Henry, 2016; Mayer et al., 2017; Reeves, 2018).

Singh, Allen and Rowan (2019), drawing on the work of Robertson and Sorensen (2018), indicated a complementary discourse, that the focus on credentialising is 'leading to a restrictive imagining of the 21st-century teacher and teaching and the promotion of generic, constructivist models of pedagogy' (p. 1). Beck, in an uncanny echo of Shaull's (1971) conformity/transformation dichotomy, warned that

> The Professional Standards discourse is built on a "technicist model" and is "profoundly reductive" suggesting that teachers and teaching is about 'acquiring a limited corpus of state prescribed knowledge accompanied by a set of similarly prescribed skills and competencies [*sic*] (2009, p. 10 cited in Singh et al., 2019, p. 1).

Singh et al. (2019, p. 1) also pointed to teachers' 'fear, anxiety, mourning and loss of hope' in this policy context. Unsurprisingly, McCallum and Price (2016, pp. 113–114) reported that 20% of teachers leave the profession in the first three years and 50% in five years due to, among other things, 'workplace-based stress'. Work as a teacher, they argued, is 'highly complex and demanding, accountability is increasing and changes in policy, curricula or political agendas impose additional burdens and time constraints on schools and their workers' (McCallum & Price, 2016, p. 114).

Regardless of the reasons behind these attrition rates, many teachers do not stay in teaching long but move to alternatives outside the profession. An increased focus

[1] This is based on my 13 years of experience as an ITE academic at the University of Adelaide.

on casualisation in teaching, both in schools and universities, contributes not only to the temporariness of employment in teaching, but also to practitioner mobility. In the university, a quarter of jobs are casual (Tertiary Education Quality and Standards Agency, 2019, p. 35), with more than 70% of undergraduate teaching undertaken by casual staff (Connell, 2019, p. 67). In schools, casualisation is perhaps less obvious, partly because of the well-established role of the temporary relief teacher; however, Bourdieu's (2010) 'flexploitation' (p. 151) appears to have found its place in all levels of education. John Smyth outlined in (2012) that nearly 20% of teachers in Victoria were in insecure employment contracts and that the majority of these were early career teachers (p. 14). Perhaps prophetically, Smyth also contended that the casualisation of the 'teaching workforce' was 'symptomatic of the performativity-driven influence of economics on education', arguing that it was

> … the canary in the mine for a much deeper malaise that has come to settle on the teaching workforces of most Western countries. It is indicative of a panoply of insulting public policy measures that have been visited upon teachers, like standards, benchmarking, performance appraisal/management systems, accountability and high-stakes testing regimes and various forms of marketisation and market-sensitive mechanisms like 'school choice' and other image and impression management 'makeovers', all of which are designed to unremittingly push teaching and the work of schools in the direction of being 'businesses' (p. 14).

At the same time as teaching is at all levels, including schools, engaged with processes of reinvention, driven largely by the creative—and, for some, confronting—possibilities of the 4th industrial age, technology, globalisation, innovation and entrepreneurialism, it is also pushed by a 'reductive' focus on teacher 'training' and credentialising.

The 'teaching workforce' also includes those who teach in universities and this sector has attracted similar critique (Coleman, 2019; Connell, 2019; Hil, 2012, 2015, 2019), sometimes in uncannily similar echoes of Smyth. ITE providers are thus hit with a 'double whammy': not only are they navigating the imposed credentialising agenda external to the university, but they are also necessarily dealing with their own internal institutional reinvention, which has similar pressures.

Universities in Australia are predominantly funded by the federal government that, regardless of political 'church', has tended to view tertiary education as an expenditure burden that needs to devolve to 'consumers' and elicit a justifying economic gain, rather than be a social investment in collective human capital. The 'public good' of universities is now only 'good' in so far as it contributes to the neo-capitalist push for paid employment. As Richard Hil (2015), anticipating Beekman and Gal (2019) above, outlined in relation to marketing strategies for universities,

> …there is a relentless emphasis on job readiness and career. Any sense of a broader, civically engaged education, grounded in less instrumental values, is crowded out by a focus on industry-relevant skills… As such, the practice of critical thinking has itself become reduced to yet another saleable commodity that is largely disconnected from any meaningful understanding of social activism or the public good… (pp. 3–4)

Hil (2015) builds on this bleak 'instrumentalist' education by commenting on the impact that it has on students, reporting that they feel isolated, lonely and lacking

in 'meaningful personal experiences' while studying at university (p. 4). Graduates 'enter a neo-liberal world of hyper-functionality that ultimately privileges work and economy over the more mundane wonders of human life' (Hil, 2015, p. 4). This sentiment is reinforced by Raewyn Connell (2019) who not only notes that the role of a student is 'fundamentally passive… as the consumer of a service…', which 'erodes the creativity of teaching' (p. 122), but continues

> Offering a priced service on the market, university managers are concerned with cost, standardization and quality control; they want predictable performance and no scandal. The erratic flame of an inspired teacher is not wanted here (p. 122).

Hil (2015) and Connell (2019) indicate the standardising ideology of tertiary institutions, in which learning is a commodity to be bought. Universities push (and are pushed) to prioritise the functionality of education with its behaviouralist promise of a career outcome for students, including those who choose to become teachers. For ITE providers, these arguments are both familiar and fundamental. Loughran and Menter (2019) acknowledged the 'measurement and compliance regimes' (p. 216) outlined by Smyth, additionally noting that 'politics, economics and ideology has [*sic*] driven many government initiatives rather than knowledge derived of scholarship in teacher education' (p. 219). Freire (2005) pointed out an irony with these 'initiatives':

> …. sometimes these experts… even explicitly promote their materials by stating that one of the main objectives of their teaching packages… is to train prospective teachers to become critical, daring, and creative. And the parody of such an expectation lies precisely in the shocking contradiction between the expressed aim and the teachers' passive behavior, enslaved by the package themselves, domesticated to the teachers' guides, limited in their adventure to create. Their autonomy and the autonomy of their schools are restrained from producing what the prepackaged practice promised: children who enjoy freedom, who are critical and creative (p. 15).

Initial teacher educators thus exist in a complex interplay of conflicting and restricting demands. In the context of neo-liberal instrumentalist universities where students are 'consumers' and academics are 'service providers', the broader context of accountability frameworks and 'performance-based administrative concerns' (Hil, 2015, p. 4) resonate in the accreditation regimes of the ITE programmes they deliver. Accreditation pushes *standardisation* of programmes of study in what is essentially a 'check box' system; *specialisation* of teaching students and graduates as professionals also set against accreditation standards and *personalisation* of teaching for an individual practitioner, where the identity of a teacher is, in part, determined by 'character' selection criteria evaluated by a computer algorithm and promoted as an expectation of 'positive' individual practice to be 'proved' via the TPA.

ITE providers are confronted by a monumental task, which is to produce teachers who are curriculum and content experts, technically competent in pedagogy, emotionally and relationally aware and agentive, not only in their own knowledge of all of these attributes, but also in fostering the knowledge of others and in the application of these knowledges to children and young adults in schools. As if this was not enough, ITE providers also need to offer proof of their effectiveness to AITSL by supplying employment numbers of their graduates' in-school contexts, in-service

teacher education and post-graduation connections with alumni. The performance indicators that will fund the university in general from 2020 are already a reality for ITE providers.

Teacher educators do this at the same time as they enact this process in relation to their own universities, i.e. maintaining their status as curriculum content experts, improving their technical competency in pedagogy, being emotionally and relationally aware, and agentive in their professional learning and relationships. They also need to demonstrate their agency and 'positive' individual practice by meeting expectations of quality determined in a large part by students' subjective evaluations post-course and programme delivery. As academics in universities, they will also, depending on their role description, have performance indicators for producing numbers of high-quality research publications according to the structures of the Excellence in Research for Australia (ERA) evaluation framework (Australian Research Council, 2020), as well as by success in grant applications, funding on which universities increasingly rely.

Being a teacher is much more than accumulating evidence and artefacts against a checklist of AITSL standards. It is a human-centred profession and pivotally so. What is missing from these considerations of both teachers and lecturers is the understanding that the teaching/learning nexus is an individualised embodied expression of *relational agency*. It is not just socially constructed or learned from a checklist, but is activated and realised in the cognitive, emotional and social connections between humans and their products, principally between educators and students, but also in all relationships of learning whether with other humans or not. Paulo Freire (2017) recognised this connectivity nearly 50 years ago in the *Pedagogy of the Oppressed* (1971 p. 48) and later in the *Pedagogy of Freedom* (1998) where he noted the 'specifically human nature of the art of teaching' (p. 127). Relational agency is critical to our understanding of learning because it recognises that learning is not 'out there' but is fundamentally constructed and internalised by humans (Vygotsky, 1978), even as it is expressed transactionally between them externally. Given space to flourish, learning as relational agency will, in part, determine directions in teaching and education—and more broadly—in the future; however, this is conceived.

Freire (1998) defined 'educative practice' as

> … all of the following: affectivity, joy, scientific seriousness, technical expertise at the service of change, and, unfortunately, the preservation of the status quo. It is exactly this static, neoliberal ideology, proposing as it does the "death of history," that converts tomorrow into today by insisting that everything is under control, everything has already been worked out and taken care of. Whence the hopeless, fatalistic, anti-utopian character of this ideology, which proposes a purely technical kind of education in which the teacher distinguishes himself or herself not by a desire to change the world but to accept it as it is. Such a teacher possesses very little capacity for critical education but quite a lot for "training," for transferring contents. … It is my duty to denounce the antihumanist character of this neoliberal pragmatism (pp. 126–127).

3.3 The Future, Teaching, and 'Twenty-First-Century Skills': Finding Relational Agency

'The future', wrote Freire (1998), 'is something to be constructed by trial and error rather than an inexorable vice that determines all our actions' (p. 54). While there is certainly value in strategising for a predicted outcome, the future does not simply happen 'to' us. Human agents, possibly teachers more than others (depending on their capacity for embracing innovation and given the freedom to do so) will play a pivotal role in shaping what is to come. An additional consideration is that human agency, 'our capacity to think about and shape the sort of future we want, based on the values we hold dear' (Hil, 2019, p. 56) is subjective, individual, inconsistent, and therefore multitudinous. For universities who, with globalisation, are educating (and employing) more people from non-traditional and international backgrounds (Enomoto, Warner, & Nygaard, 2018, p. 1), this diversity will not be implicit but will be actively realised in the growing cultural diversity of these communities.

ITE providers operate in a context of accreditation standards that aim to homogenise the graduate teacher for a career in a 'gig' economy for a profession named on their testamur. However, the 'named credential' is not an indicator of a clear pathway from graduation in a profession to employment in it. If teachers need the flexibility to move between careers as well as work in occupations that have no contemporary equivalents (Enomoto, Warner, & Nygaard, 2018, p. 4), and their attrition numbers suggest that they do (McCallum & Price, 2016), then ITE providers need to both credentialise *and* prepare teachers for transformational change. Unless there is a significant reinvention of the funding, purpose and process of formal education in Australia and more globally, this has to happen in the context of a 'static and underinvested' (WEF, 2017, p. 5) rationalist, instrumentalist model, where pedagogical innovation must also be cost effective and demonstrate educational impact (Enomoto, Warner, & Nygaard, 2018, p. 5).

Because teachers in schools also engage with their own students in educating within these constraints, this preparation cannot be another 'surface level' checklist such as is (arguably) used in ITE. Students and their teachers cannot simply 'bank' these skills (Freire, 2017, p. 46) because they will need to be responsive to transformation, even as they are agents of it. As Freire (2017) forewarned

> The more students work at storing the deposits entrusted to them, the less they develop the critical consciousness which would result from their intervention in the world as transformers of that world. The more completely they accept the passive role imposed on them, the more they tend simply to adapt to the world as it is and to the fragmented view of reality imposed on them (p. 46).

In other words, adding a list of characteristics that denote preferred twenty-first-century skills such as that proposed by the WEF (2015, p. 3; see Fig. 3.1. *Students require 16 skills for the 21st century*) is not enough. What is missing is a reconsideration of *how* school teachers, ITE providers and university educators more widely should incorporate these 'essentialist' skills in their teaching and their own learning, to transform not only the external expressions and the interactions in the performance

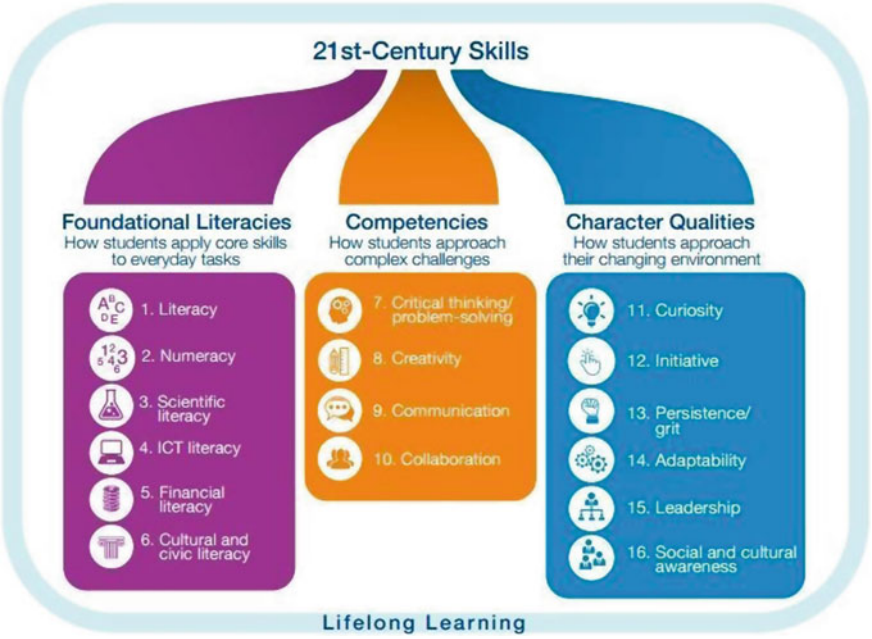

Fig. 3.1 Students require 16 skills for the twenty-first century. *Source* World Economic Forum's New Vision for Education: Fostering Social and Emotional Learning through Technology World Economic Forum, Switzerland, March 2016

of graduate professions, but also the internal cognitive and ontological perspectives of the humans that they teach.

For example, 'creativity' is a key and often listed twenty-first-century skill, but one does not simply add 'creativity' to a learning event or research process and provide opportunities for 'creative' choices or pose a problem ripe for a 'creative' solution. It may or may not happen, but it is certainly true that creativity will not happen without opportunity and time. Creativity, as a process, is more complex than an 'event', involving the interplay of curiosity, problem-posing, ideation, discovery, hunch, failure, action, intervention, extrapolation, 'unpacking', strategising, play, confusion, imagination, argument, epiphany and so on. Additional affective aspects that can undermine and/or drive the human processes of 'creativity', such as how an individual reacts to failure, could also be included in this consideration. Affective elements are fundamental and bring ever more complex transactions between emotional, cognitive and 'inspirational' aspects, such that they coalesce into the process/product we call 'creativity'. Despite this complexity, creativity is commonly seen as an essential twenty-first-century skill, but it is clearly not a well-defined one—as US Justice Potter Stewart famously remarked in relation to the category 'obscenity', we appear to 'know it when we see it' (Stewart, 1964).

All the other skills included in the WEF list are just as complex with subjective meanings, contexts, expressions and associations.

Relational agency was defined above as *activated in the cognitive, emotional and social connections between humans and their products, principally between educators and students, but also in all relationships of learning whether with other humans or not*. It is misleading, however, to suggest that the relational agent is entirely focused on the 'cognitive, emotional and social connections' without recognition of the importance of learning as an outcome. However pedagogically constructed, the relationships between teachers and students in formal education systems are, in part, driven by positions of hierarchical power regardless of whether the pedagogical process is teacher- or learner-centred and/or its ethical or philosophical dimensions. A teacher may be, after Freire (2017), a dialogic co-constructer of knowledge (p. 53) 'flattening' this hierarchy, but they are also, as a professional in a position of authority, an assessor, arbitrator, mentor and sanctioner of learning within a pragmatic context and, for students at least, with a pragmatic outcome. While Freire's stance on the 'banking system of education' is justified (pp. 46–53), 'problem-posing education' where the student and the teacher engage in a dialogic 'unveiling of reality' (p. 54) nevertheless takes place within an actual reality—a university or a school.

In other words, the *affective* teaching rapport, relationally agentive as it is, focused on the emotional and empathetic, and responsive to and respectful of the learner, needs to be balanced with the *effective* teaching relationship that is considerate of outcomes. Agency is (or perhaps should be) driven by a critical consciousness that what one knows may be important, but also may be restricted and/or incomplete. Unless learning has a point, agency is stymied, a point Freire (1998) acknowledged in his argument that he 'can neither teach nor learn unless driven, disturbed, and forced by the energy that curiosity brings to my being' (p. 80). Freire also pointed to the problem of institutional 'domestication' of curiosity and the limitations that this places on knowledge (p. 80).

However, learning has broader goals for individuals than the interactions in a classroom, however, dialogic. For ITE students, it is to become a teacher. For ITE academics, it is to engage transactionally with these students employing agency and reflection to foster the students' journey to the realisation of this becoming, albeit with the understanding that becoming a teacher does not end with graduation. An additional consideration is that, since the future careers of ITE graduates are likely to be 'multiple' (Owen, 2017, p. 3), 'becoming a teacher' is in itself a misnomer: an ITE student may aim to be a teacher, but after graduation they are predicted to be employed outside of the profession and possibly not in the broad field of education at all.

Relational agency, therefore, is not fostered solely by educators involved in ITE. It is a twenty-first-century skill and one which is nominally implied in the WEF's (2016) Social and Emotional Learning (SEL), defined as 'self-awareness, self-management, social awareness, relationship skills and responsible decision-making' (Endnote 1, p. 34). Relational agency is also inferred in so-called 'soft skills', definitions of which are acknowledged by Matteson, Anderson and Boyden (2016, p. 71) as 'fuzzy'. They can include problem-solving, leadership, self-management, communication skills, ethical judgement, personal learning skills, diversity sensitivity, team skills, motivation, critical thinking, customer service skills and emotional intelligence (Matteson,

Anderson & Boyden, 2016). Both SEL and 'soft skills' indirectly infer relational agency; however, these categorisations are both incomplete and lack the element of social constructivism (Vygotsky, 1978) that underpins its cognitive internalisation and expression.

In Freire's (2005) Ninth Letter, 'Concrete context/Theoretical context', he proposed that the 'fundamental condition of life is the condition of relationship, relationship to oneself and to the surrounding world' (p. 136). This is perhaps the fundamental basis of learning—to explore these conditions both with and for humans, and their products. Relational agency, for teachers and learners, is an unconscious and conscious push for connection in which the social transactions in language and other human-focused expressions engage with growing cognition to embed learning outcomes. These include purposeful and hidden outcomes: a teacher learns about their student, their context and what they know; a student similarly learns about their teacher, as well as the subject being taught. To use a cultural metaphor, during the process of cognitively constructing knowledge, both teachers and learners hold respective 'knowledge diasporas', perpetually incomplete constructions of understanding that intersect in environments of learning. By itself, the 'banking' of knowledge is insufficient: it is the relational agency of orchestration and performance of the elements of knowledge coupled with cognitive and 'diasporadic' connections where learning, as relational agency, occurs.

3.4 Standards, Relational Agency and the 'Development and Deployment of Talent'

Relational agency, the connections that educators make at the fundamentally human level, is functionally mobile across professions because it is also the agency in living in and creating conditions for future living, hopefully in situations of improved economic and physical well-being. As places of learning, universities and schools, and teachers as their representatives, need to produce a credentialising outcome for student communities that aligns with career aspirations (for both), but teachers are not alone this construction. Students, as relational agents themselves, actively engage with the transactions of learning—or learning does not happen. In the current neo-liberal funding model for Australian universities, students pay a considerable amount of money for the privilege and many, according to Hil (2015) and Connell (2019), are dissatisfied customers.

But education in itself, as Connell (2019) noted, is 'not a commodity. Education happens in human encounters that depend on care, trust, responsibility and truth, and such encounters cannot be packaged and sold' (p. 119). The implication is that the human encounters Connell describes can happen despite neo-liberal agenda and she later elaborates on the potential actors in reconceptualising the 'good public universities for the public good' (Connell, 2019, pp. 186–188). What she does not do is consider the smaller scale association between teacher and student and how, at

a level of human encounter, relational agents can work collaboratively to initiate and maintain spaces of alliance for change.

While it is tempting to simply suggest that funding to schools and universities be dramatically increased, accreditation standards for teachers be scrapped and the role of universities be realigned with a 'civically engaged education' (Hil, 2015, p. 3), these are idealistic and unlikely outcomes. As Hil (2019) noted

> … it's hard to break out of the straight jacket, especially in the current university environment. The fact that the nature of institutional governance is such that discussions about 'future directions', or what the suits [*sic*] like to refer to as 'strategic planning', are conducted in the narrowest of terms, often privileging senior managers and an eye on brand promotion, market share and bottom lines. The gulf between senior management and academic staff… means that certain voices tend to dominate policy discussions, and rather than questioning the neoliberal orthodoxy, they continually reinforce it (p. 56).

This support of orthodoxy is despite the WEF's (2017) contentions (above) that 'prevailing cultural norms and institutional inertia' are creating 'roadblocks' in the reconsideration of how human talent is 'developed and deployed' and the fact that technology and globalisation will have a significant impact on 'job destruction and job creation' (p. 5). There is clearly a need to address this 'inertia'.

In the humanistic relational agency inherent in Freirean critical pedagogy, university educators and their student allies can work together within a context that valorises their 'human encounters' because of their clear focus on learning-focused reflective interaction. While neo-liberal orthodoxy is reinforced in teacher education where the 'panopticon' surveillance of AITSL accreditation is ever-present, there are nevertheless opportunities to critique the credentialising paradigm even as ITE providers and students are subject to its imposts.

Fundamentally, though, we are left with a complex uncertainty, which is perhaps why AITSL standards and checklists offer the university and ITE administrators comforting anchors: predictive outcomes for a future that appears to ignore the possibilities for relational agency and checklists of standards and skillsets that reduce the educative process in universities and schools to instrumentalist competencies that validate/invalidate teachers as professionals. Checklists are a more or less reliable and objective way for governments and their proxies to impose accountability frameworks by which to scrutinise, surveil and licence educators.

With this in mind, perhaps the most fruitful discussions are to be had around reconsidering the 37 focus areas of the APST standards themselves, broadening some to include the idea of well-being for both teachers and students, twenty-first-century skills—with the understanding that these will need to be defined—and, most importantly, the principle that knowledge of and practice in teaching is not formulaic, but an individualised and contextual 'concert' of intersecting cognitive, emotional and social skills; decisions; facts; capacities and processes. As Freire (1998) suggested the qualities that teachers need to have a progressive pedagogical practice include 'a generous loving heart, respect for others, tolerance, humility, a joyful disposition, love of life, openness to what is new, a disposition to welcome change, perseverance in the struggle, a refusal of determinism, a spirit of hope, and openness to justice' and not a 'merely scientific, technical mind' (p. 108). These qualities, arguably, are not

included in the APSTs, i.e. there is no consideration of creative change, innovation or relational agency, and yet all three could both be principles *within* the APSTs as well as act as methodology for their reconsideration.

3.5 Conclusion

This chapter used the critical lens of Paulo Freire to explore the skills needed for engaging with future directions in learning and employment. According to the WEF (2017), our preparation for twenty-first-century employment will be dependent, in part, on our ability to embrace change and to reinvent education and training systems that have been, until now, underinvested, static and lacking in responsive agility (p. 5). Teacher educators operate in accreditation, standards and compliance regimes, partly imposed by governments outside of the university, but also embedded within the university's accountability frameworks. These structures are antithetical to the agility that the WEF (2015) posits as being essential for the 'development and deployment' of individual and collective talent (p. 5). This will become more challenging as globalisation and technology make our teaching contexts, and the actors within them, increasingly diverse.

This chapter contends that relational agency, embodied in the teacher–student connection, is a way to reconsider the processes by which both accreditation and education in schools and universities occur. It concludes by proposing, in relation to the WEF's three interconnected features stymying the 'development and deployment of talent', that a Freirean critical lens with its focus on human agency, interactions and reflections, could contribute to a reconceptualisation of the APSTs and teacher accreditation more generally.

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Chapter 4
The Impact of Introducing iPads in Teacher Education: A Case Study

Walter Barbieri

Abstract While continuing apace, deploying 1:1 technologies in educational institutions is characterised by inconsistent implementational effectiveness. For every study that points to the potential of personalised classroom technologies, another highlights their failures. Among the most pronounced problems are the inadequate digital capabilities of teachers. This case study examined how deploying 1:1 iPads in an undergraduate Individual Teacher Education (ITE) degree influenced the digital competencies of its participants. An online survey was disseminated twice—at the beginning of the 2019 academic year and one semester later—to a cohort (n = 184) of ITE students who participated in the eLearning Programme at the School of Education at the University of Adelaide and a control group (n = 178). Additional data from the participant groups were also collected. The digital capabilities of the experimental group improved significantly across the study's time frame, whereas they remained static for the control group. The amount of printing per experimental group participant (an indicator of the extent of the digitisation of participants' processes) was markedly lower than that of the control group. The study concluded that a comprehensive, multifaceted programme targeting the digital capabilities of ITE students assisted in achieving the aim. This case study presents findings of practical relevance to ITE institutions on how digital capabilities and their application to teaching and learning can be enhanced in their programmes.

Keywords Twenty-first-century teaching · Bring your own device (BYOD) · Higher education · Teacher education · Technologies

4.1 Introduction and Background

This chapter explicitly links to the themes of *Critical Perspectives on Teaching, Learning, and Leadership: Enhancing Educational Outcomes* by highlighting how the introduction of 1:1 iPads can enhance the digital capabilities of pre-service

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teachers. This study describes the characteristics of the eLearning Programme introduced at the School of Education of the University of Adelaide and provides evidence on the positive impact that this programme has had on the self-efficacy of its participants. The case study therefore provides a new perspective on how to help pre-service teachers enter the profession with the required skills and confidence to thrive in a digitally connected classroom.

School and university students across an increasing number of countries have near-ubiquitous access to computer technologies (Sundgren, 2017). International studies have reported that the rate of ownership of personalised devices in Australian universities is higher than those in other sampled countries (Kerr, Talaei-Khoei, & Ghapanchi, 2018). A similar pattern is evident in Australian schools. When compared to 36 other sampled Organisation for Economic Co-operation and Development (OECD) countries, Australian secondary schools featured particularly low ratios between device and student numbers (OECD, 2015). Increasingly, the device ownership model is tending towards 1:1, student-owned portable devices, to be used by learners across their full range of subjects. When measuring the spread of ICT use across the breadth of subject areas (labelled by the Programme for International Student Assessment as the 'ICT index'), Australia was ranked third (OECD, 2015).

The available literature on the introduction of 1:1 computer technologies in educational institutions points to mixed effectiveness. Some studies highlight the innovative and effective teaching practices and learning experiences that can be unlocked by personalised technologies. Others report a dearth of benefits and discuss additional challenges brought upon by the presence of computers in classrooms. When technologies are skilfully deployed by teachers with fitting mindsets and skill sets, they can have a significantly positive impact on students' learning experience. For instance, a study that interviewed 11 teachers from different schools who had won awards for their use of technology in the classroom found that their pedagogical beliefs were invariably student centred, placing particular importance on pedagogical elements such as student choice, authenticity of content and assessments, and collaboration and empathy in a constructivist pedagogical paradigm (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). OECD (2015) data bears this narrative out. An exploration of the relationship between teachers' use of digital technologies and their pedagogy found that in classrooms where learning focused on 'formulating and solving real-world problems, students reported that their teachers use computers to a greater extent' (p. 16). Similarly, teachers who are more inclined to use 'student-oriented teaching practices, such as group work, individualised learning and project work are more likely to use digital resources' (OECD, 2015, p. 16). Therefore, the contemporary use of technologies, ostensibly, goes hand in hand with contemporary thinking about pedagogies.

Many teachers have embedded technology into so many of their processes that it has become somewhat invisible. For the teachers interviewed by Paiva, Morais, Costa, and Pinheiro (2016), the idiom *eLearning* is indiscernible from the idiom *learning*, such that 'they will soon drop the *e*' (p. 228). The importance of learning technologies to education is underscored by Leon Benade, who highlights the need for students to demonstrate effective digital capabilities that enable them to not only

consume, but also create and process content through digital means. Benade (2017) described such 'key competencies' as both engaging with 'changes to teaching and learning in schools that result from digital technology' and also students' ability becomes a 'competent digital learner in a lifetime of new technology and change' (p. 30). Okeke, van Wyk, and Phasha (2014) argued that digital technologies are reshaping what literacy means in the twenty-first century, as they continue to impact on—not just deliver—the way information is communicated and exchanged. Those digital technologies have a role to play in contemporary classrooms, and that they can have positive impacts therein is, then, unquestionable, but the extent to which this takes place certainly is.

The widespread presence of student-owned portable computers in educational institutions is not a reliable predictor of their modality of use or of their effectiveness at achieving any given learning or teaching outcome. This observation has been made by several studies, both in secondary and tertiary contexts. Farley et al. (2015) found that mobile devices have not changed many aspects of the teaching and learning process. After surveying students at Australian regional universities, the researchers found that they nearly all held personalised technologies but were rarely being directed to use them for learning. It appears, at times, that students used technology for learning despite—rather than because of—their educators. In a similar enquiry, Cochrane et al. (2014) indicated that the introduction of 1:1 technologies in schools often has, at best, a substitutive, like-with-like effect on teaching and learning processes. The 2015 report by PISA: *Students, Computers and Learning* reinforces the perception that learning technologies have not brought about an improvement in learning commensurate with their perceived potential. PISA concludes, reasonably, that 'the connections among students, computers and learning are neither simple nor hard-wired' and that the potential impact of ICT on teaching and learning is 'yet to be fully realised' (p. 15). PISA attributes much of this failure to teachers, as is evident in the tone of its conclusion: 'in the end, technology can amplify great teaching, but great technology cannot replace poor teaching' (p. 17). More recent research has reported similar findings. A systematic review of educational technologies involving iPads revealed that the introduction of this device to universities increased student engagement but did not actually improve learning outcomes (Nguyen, Barton, & Nguyen, 2015). This view was echoed by Neil Selwyn's *Left to their own Devices* (2017) where he reported the result of his visits to schools in Australia that had asked their students to bring devices to all of their classes. He highlighted the all too often ordinary ways in which staff and students make use of devices in classrooms. With oblique reference to Reuben Puentedura's (2013) hierarchical SAMR framework, Selwyn claimed that rather than constituting a 'radically transformational form of schooling, […] the heightened presence of personal technologies is becoming subsumed into existing micro-politics of school organisations and practices' (p. 1). In practice, Selwyn found that computers were mostly used for word processing and some web surfing to find information. Rarely were computers used, in his observations, for processes that could not be achieved by a printed textbook and a typewriter. Implied in this analysis was that it is the immovability of the teaching and learning process that is the problem. There's no point in using computers, one

could argue, if the only thing that changes is the medium, but not the learning activity itself.

One finding from relevant research that is almost universal, both in school and university contexts, is that introducing devices into educational institutions is not by itself enough to significantly change teaching and learning practices. The reasons for the patchy and underwhelming benefits of technology in teaching and learning are numerous and not yet fully understood. Among them are the challenges of technology neutrality, which underpin many Bring Your Own Device (BYOD) models. Technology neutrality is a concept and business practice that emerged in the late 1990s in direct consequence to the growth of the internet and thereafter made its way into legal discourse largely due to the scholarship of Bert-Jaap Koops (2006). Technology neutrality is a thought process that focuses predominantly on outcomes and makes an explicit effort to not choose tools for their achievement. In schools, technology neutrality has morphed into the BYOD construct (Johnson et al., 2016), a practice of allowing students to bring any internet-connected device into a classroom. BYOD puts teachers in the unenviable position of planning tech-rich activities without being certain that they will work on all devices in their class. This problem has demonstrably hindered many teachers from exploring the potential of technology in their classroom (Johnson, 2009; McQuiggan, Kosturko, McQuiggan & Sabourin, 2015). Therefore, to some extent, preventable technical barriers to the successful use of learning technologies, caused by implementation models in schools, may help to explain the patchy effectiveness of learning technologies.

Other reasons are closer to home. Teachers themselves have come under scrutiny for their lack of ability and propensity to use learning technologies in ways that improve their practice and students' learning. As a case in point, two years after the Malaysian Government introduced a standard virtual learning environment for all state schools, the auditor general reported that fewer than 5% of Malaysian teachers were using it daily (Cheok, Wong, Mohd Ayub & Mahmud, 2016). The researchers found that common beliefs, held both in schools and at university teacher training centres, were at the core of the low uptake of technology. Dias and Diniz (2013), whose research sampled 75 educators and 1037 students, similarly argued that many teachers found no need to shift to new educational tools or practices as they deemed their existing methods to be already successful. As the researchers stated, 'The key is intention' (p. 38). For these teachers, becoming effectively innovative through technology will require a paradigm shift.

Suboptimal use of learning technologies is, however, not always the result of technology denialism. Among the most frequently cited reasons for the incomplete or inadequate ways in which technologies are being leveraged for learning is insufficiently sustained professional development in both the technological tools and pedagogical approaches that befit them. Such were the observations of Drennan and Moll (2018), who found that technology coaching secured improvements in teachers' use of iPads for learning and simultaneously argued that insufficient coaching was delivered. Another study (Stone, 2017) points to the extent of exposure to teacher professional learning in the use of educational technologies as having a discernible influence on the way students perceive technology in the classroom. As will be seen,

the role of professional development is specifically relevant to the research questions and conclusions of the present study.

The effectiveness of sustained professional development implies that teachers' digital capabilities are an important consideration. Seeing as technological and pedagogical coaches focus much of their attention on developing teachers' digital literacy (Adhikari, Scogings, Anuradha & Sofat, 2017), it follows that confidence in the operational skills with regard to digital technologies is seen as a material contributor to the successful utilisation of learning technologies. Jansen and van der Merwe (2015) described digital literacy for teachers as 'the ability to use digital artefacts as an integrated part of their pedagogical content knowledge and be aware of what implications this has for teaching and learning strategies' (p. 2). This perspective, which charts the overlapping Venn circles of pedagogy, content, and technology, invokes Mishra's and Koehler's (2006) TPACK (Technology, Pedagogical, Content Knowledge), confirming the importance of technological knowledge as a dimension of teacher capabilities.

Arguably, one solution to the contemporaneous importance and scarcity of teacher professional learning in the effective use of educational technologies lies within ITE. Foregrounding technology throughout ITE can help to equip early career teachers with the skills they will need in employment—skills that evidently continue to challenge many practising teachers. Some researchers have already sought lines of enquiry that focus on the use of digital technologies in ITE. Much like those described above, their findings are mixed. For instance, the impact of handing iPads to 11 PSTs in 2010 was explored by Jain and Luaran (2016), who observed that participants found the devices good for personal use but not functional for teaching. Erstad, Eickelmann, and Eichhorn (2015) provided an international overview of technologies in ITE and argued for the necessity of preparing early career teachers for 'roles as change agents' (p. 651). Hasse (2017) claimed that 'it is more important than ever that teachers learn to deal with how educational technologies affect teaching and learning' (p. 366) from the outset and that this learning should encompass both digital capabilities and pedagogical capabilities. Francom and Moon (2018) followed the journey of PSTs who brought 1:1 devices into primary school placements and found only limited improvements in digital capabilities. So, again, when dealing with educational technologies, findings from a range of available studies are at times self-contradictory and overall not conclusive. So, this is in part due to the heterogeneous contexts of the case studies behind these findings. The case study presented in this paper presents one approach to technology integration and its impact on the digital capabilities of ITE tertiary undergraduate students.

4.2 Objectives

The present study describes the deployment of 1:1 iPads among PSTs at the School of Education at the University of Adelaide and aims to reveal its effect on participants' digital capabilities and their application of digital technology to learning and

teaching. In 2019, all 184 first-year PSTs of the Bachelor of Teaching (BTeach) degree were requested to possess an iPad (6th gen or Pro, such that it may support handwriting as well as typing and touchscreen capabilities). They are the experimental group. The iPad's presence was part of a broader eLearning Programme at the School of Education, involving a range of structured professional development activities to help students and their lecturers use learning technologies meaningfully. In 2019, all 178 second-year PSTs of the same degree did not use an iPad nor participate in the eLearning Programme. They are the control group.

The overall aims of the eLearning Programme are to enrich the teaching practices and learning experiences at the School of Education at the University of Adelaide through the meaningful, skilful, and innovative use of contemporary technologies. In turn, the eLearning Programme aims to enrich the learning of the schoolchildren with whom PSTs will eventually work. More specifically, the eLearning Programme aspires to achieve the following key performance indicators:

- to help PSTs and academic staff gain Apple Teacher status
- to renew the ways the School of Education plans, resources, delivers, and assesses courses through digital technologies, in keeping with regulatory and organisational parameters
- to secure placements for more PSTs in schools that make mature use of learning technologies
- to assess the use of technology by PSTs in their learning and placements

The activities that collectively termed the eLearning Programme are described below:

- a series of small group curriculum planning collaborations to pursue the renewal of course design, looking for ways to improve the way desired learning outcomes are achieved. This process is underpinned by the aforementioned SAMR and TPACK frameworks. Its outcome is to develop resources and assessments through the contextual use of learning technologies, such that eLearning objectives befit the course's content and outcomes.
- academic staff and PSTs are encouraged to achieve Apple Teacher status, a qualification obtained by passing online assessments that test one's ability to use iPad technologies in teaching and learning contexts. This objective is assisted through a series of face-to-face professional development workshops delivered on campus.
- to assist with technical challenges, PSTs and staff also have access to regular 1:1 clinics on campus during which individual support for iPad technical or pedagogical needs is provided.
- an online course is available to PSTs and academic staff on the university's learning management system hosting resources for use on-demand. These aim to help learners apply their newly found digital capabilities to their learning and teaching.
- an incentivised programme encourages PSTs to become leaders in the use of digital technologies for learning and teaching, and be nominated to become

eLearning Champions, who are thereafter offered the opportunity to be employed by the University of Adelaide in the delivery of eLearning workshops.
- a range of visiting experts in the field of educational technologies regularly present to both academic staff and PSTs. These include practising teachers, Apple Distinguished Educators, and researchers and thought leaders in the field of the application of technology to enhance learning.
- relationships with schools that make mature use of learning technologies are leveraged to secure prioritised placements for PSTs, who are invited to use the digital capabilities that they have been developing, and also learn from practising teachers who are currently operating in those contexts.
- modification to existing learning spaces is also centred around educational technologies, in particular through the use of Apple TVs to facilitate wireless projection and enable student access to projection facilities.

The eLearning Programme reported here spanned the first semester of the 2019 academic year. The programme is ongoing.

4.3 Research Questions

The research questions addressed in this study were as follows:

RQ1: What is the difference in the digital capabilities of first-year BTeach PSTs (the experimental group) at the beginning of and after one semester of exposure to the eLearning Programme?
RQ2: What is the difference in the digital capabilities of second-year BTeach PSTs (the control group) at the beginning of and after one semester without exposure to the eLearning Programme?
RQ3: What is the difference in the per capita printing quantity of the first-year BTeach PSTs (the experimental group) and the second-year BTeach PSTs (the control group) during semester 1 of their first year of studies?

4.4 Method

This study operates within a broader pragmatic worldview theoretical framework. The main concerns of such a worldview are the identification of problems, implementation of actions, and exploration of their consequences (Tashakkori & Teddlie, 2010). Rather than being committed to a systematic, predetermined enquiry model or a homogeneous philosophical perspective, this study's approach is embedded in its contextual considerations. The pragmatic approach to this research befits the scope of a case study (Yin, 2012), as this research is *in loco*, situated in a specific place and time—that being undergraduate students of the BTeach degree at the School of Education of the University of Adelaide in 2019. Therefore, while the context being

observed undoubtedly has connections to the theories and culture in which it exists, it is nonetheless situated rather than abstracted. A quantitative pragmatic approach, therefore, befits the nature of this research, but it does not necessarily make it simpler. The theoretical framework imposes additional incentives for the method to justify its contextual validity. This justification pertains not only to the semantic content of the data collection tools, but also to their structural and communicative characteristics, and the implementation procedures thereof.

The survey questions used in the present study asked participants to determine to what extent they felt confident in their digital capabilities and in their use of technology for their own learning and teaching. As such, the questions were framed in the conceptual framework of self-efficacy. Bandura (1977) first defined self-efficacy in an educational context as 'personal judgments of one's capabilities to organise and execute courses of action to attain designated types of educational performances' (p. 200). The key to understanding self-efficacy is that it is not the same as actual attainment or capability, but rather is a measure of personal judgment. It is therefore associated with a sense of self-knowledge, of appreciating the breadth and extent of one's abilities, and of understanding how to achieve it.

Self-efficacy, however, does have a directly proportional impact on the extent of learning and outcomes. As revealed by Zimmerman (2000), healthy self-efficacy is 'an essential motive to learn' (p. 82) and is conducive to finding meaning in learning. Indeed, predictably aids the high achievement in assessments, as it 'correlates positively with students' rate of solution' of problems (Jansen & van der Merwe, 2015, p. 204).

4.4.1 Participants

The eLearning Programme has been introduced through a phased approach, such that it applied to first-year students only in 2019 and is scheduled to stretch to both first- and second-year students in 2020 and so on until covering the entire BTeach degree by 2022. This gradual introduction informed the sample selection. The experimental group consisted of voluntary participants from the first-year BTeach student cohort—those who had been involved in the eLearning Programme ($n = 184$). The control group consisted of voluntary participants from the second-year BTeach student cohort—who were not involved in the eLearning Programme because they began their degree prior to the commencement of the programme ($n = 178$). These two groups were selected due to the limited variables between them. While the students in the first-year group and the second-year group were different people, at the cohort level, the two groups were remarkably similar. Both groups of students accessed the BTeach course with the same entry parameters and conducted the same courses of study throughout their first semester of the degree. The one-year demographic difference between the groups was also immaterial with regard to digital capabilities because these were not taught in the first year of the degree of the control group. The clearest difference between the way the two cohorts had engaged with their BTeach studies was the eLearning Programme.

4.4.2 Data Collection

The data collection procedures were developed in such a way that the differences between the student cohorts may remain known and contained. All participants were asked to voluntarily respond to the same survey at the same time—at the beginning of the 2019 academic year and the end of the first semester of the 2019 academic year (12 weeks later). While the variable of the different courses being taught to the two cohorts during semester 1 of 2019 persists, none of the courses taught focused on learning technologies in their content or learning outcomes; therefore, the variable was not consequential to digital capabilities. The repetitious nature and synchronous timing of the survey deployment procedure enabled the identification of change over time.

4.4.3 Survey Design

Before addressing the semantics of the survey questions, it is worth considering the structural characteristics of the questions and answers thereof. They were written in accordance with the principles of effective survey design, including linguistic directness, simplicity, specificity, and consistency among definitions and terminology throughout (Iarossi, 2006).

The survey design for the specific requirements of this research used questions posed as mildly affirmative statements, without superlative adjectives, to which the participants were asked to express their degree of agreement or disagreement. The answer options by which the participants responded to the questions adopted a 7-point Likert scale, which is a verified method of determining responder opinion (Wilson, 2013), with statistical validity in relation to the within-person variability (Lang et al., 2019) that can be elicited with questions pertaining to self-efficacy. The 7-point Likert scale featured the options:

7 = Strongly agree
6
5
4 = Neither agree nor disagree
3
2
1 = Strongly disagree

A final consideration worth raising regards acquiescence bias. This phenomenon describes the tendency to respond repetitively and positively to questionnaires, such as that used in this study, which propose several questions with identical response options (Saris, Revilla, Krosnick & Shaeffer, 2010). For this survey, the control group survey acted as a convincing mitigating factor for this known weakness in survey design, as such weakness is equally applicable to the experimental group and the control group, meaning that it is neutralised in any comparative analysis.

4.4.4 Survey Criteria

The criteria used for the survey in the present study was drawn from the University of Adelaide's Digital Capabilities Framework, which itself originated from the work of the Joint Information Systems Committee (JISC). The two frameworks are almost entirely congruent (see Appendix 4.1), which affords the Adelaide Digital Capabilities Framework the same level of validity attributed to the JISC framework. Each of the elements of the Adelaide Digital Capabilities Framework is further elaborated into sub-elements, which assist in the practical applicability of the elements. For instance, 'Digital learning and development' foregrounds the ability to self-learn how to use technologies. 'Digital creation, problem solving, and innovation' highlights the importance of being able to use technology in new ways that are unfamiliar to others. 'Information, media, and data literacy' places importance on the role of technology in research and on one's ability to evaluate information found online. 'Collaboration, communication, and participation' is explicit about using technology to work synchronously and asynchronously in teams.

The Adelaide Digital Capabilities Framework's elaborations have been specifically used to design the survey questions for the present study, as it is the relevant institutional document to which students are pointed at induction, and which students can continuously access thereafter. The survey questions used in this study were as follows:

1. I feel that I am productive when using technology
2. I feel that I am able to self-learn how to use technology
3. I am able to use technology to collaborate with others
4. I am able to control the ways I use technology and the amount of time I spend on technology
5. I feel confident in using technology to control my online identity
6. I feel that I know how to find correct, reliable information online
7. I am able to use technology to conduct research
8. I am able to build spreadsheets and manage data, as well as interpret data in other databases through technology
9. I use technology in innovative ways
10. Overall, I feel confident with using technology for learning
11. Overall, I feel confident with using technology for teaching.

Regarding research question 3, the printing quantities of the experimental group and the control group were obtained from the university's central printing system. The control group's printing data were sourced from semester 1, 2018 (when this group was completing the first course of its first year of the BTeach). The experimental group's printing data were sourced from semester 1, 2019 (when this group was completing the same first course of its first year of the BTeach). Therefore, the BTeach academic requirements, resources, and assessments of the two groups were very similar, as they were drawn from the same course. The only systematic difference to the BTeach course delivery was the presence of the eLearning Programme. The

data points collected relating to printing include both printing and photocopying, and feature cohort and per capita measures of total printing, black and white pages, colour pages, and printing costs.

4.5 Results

As this study collects data before and after the implementation of the eLearning Programme, the results will be explained and revealed in their chronological sequence. Presented first are the results of the digital capabilities survey conducted at the beginning of semester 1, 2019 by both the experimental group and the control group. Described next are the responses by the same groups to the same survey at the end of semester 1, 2019. Following these is the printing data collected for the experimental and control groups at the end of semester 1 of the first year of their degree.

Table 4.1 displays the number of responses given to each of the seven levels of the Likert scale for each of the 11 survey questions, provided by the experimental group at the beginning of semester 1, 2019. This sample consisted of a total of 184 students, 101 (54%) of whom responded to the online survey. Figure 4.1 displays the

Table 4.1 Experimental Group: Beginning of Semester 1, 2019

Likert Score	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
1	5	6	22	4	3	4	6	7	12	11	21
2	6	16	11	3	8	3	2	5	10	15	17
3	20	15	8	10	9	10	11	11	21	11	7
4	11	8	9	21	12	18	15	11	22	8	7
5	24	19	23	24	18	28	30	31	14	13	17
6	22	16	20	15	10	22	22	17	9	22	18
7	13	21	8	24	41	16	15	19	13	21	14

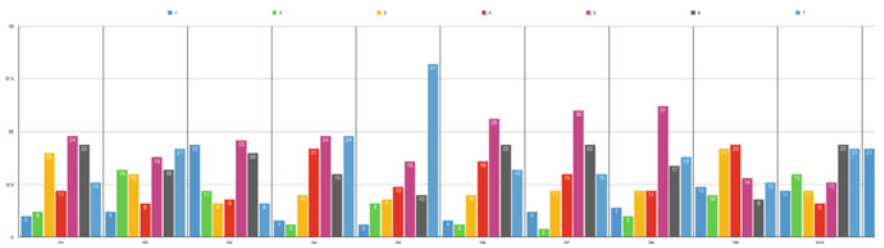

Fig. 4.1 Likert scale response frequency for each survey question for the experimental group at the beginning of semester 1, 2019

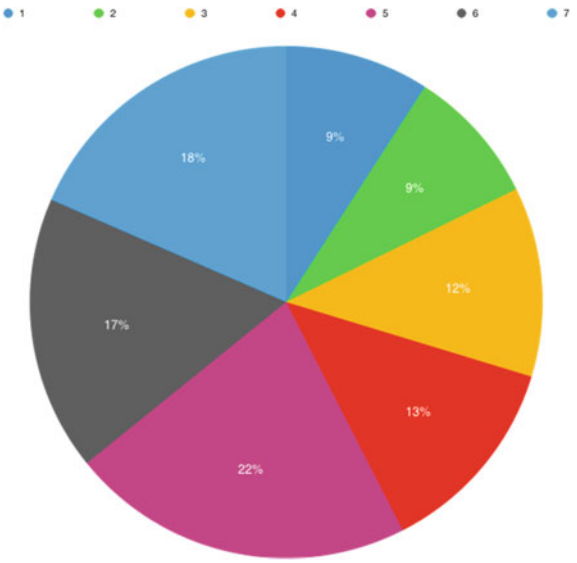

Fig. 4.2 Likert scale response proportion for all survey questions combined for the experimental group at the beginning of semester 1, 2019

frequency of Likert responses by question, whereas Fig. 4.2 depicts the reasonably even spread in responses when collated by Likert scale value (Figs. 4.3 and 4.4).

Table 4.2 displays the frequency of responses given to each of the seven levels of the Likert scale for each of the 11 survey questions, given by the control group at the beginning of semester 1, 2019. This sample consisted of a total of 174 students, 63 (36%) of whom responded to the online survey.

Table 4.3 displays the frequency of responses given to each of the seven levels of the Likert scale for each of the 11 survey questions, given by the experimental group at the end of semester 1, 2019. This sample consisted of a total of 184 students, 94 (51%) of whom responded to the online survey (Figs. 4.5 and 4.6).

Table 4.4 displays the frequency of responses given to each of the seven levels of the Likert scale for each of the 11 survey questions, given by the control group at the end of semester 1, 2019. This sample consisted of a total of 174 students, 61 (35%) of whom responded to the online survey (Figs. 4.7 and 4.8).

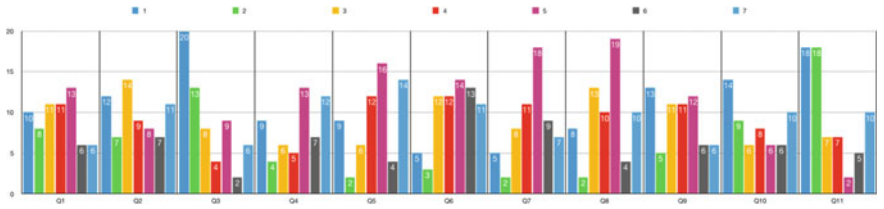

Fig. 4.3 Likert scale response frequency for each survey question for the control group at the beginning of semester 1, 2019

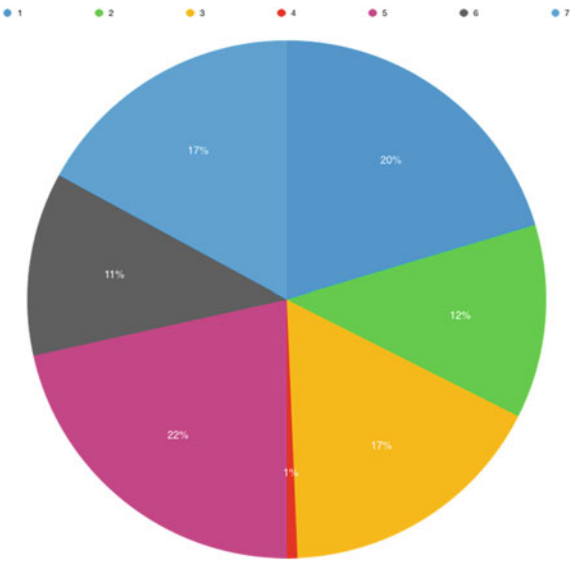

Fig. 4.4 Likert scale response proportion for all survey questions combined for the control group at the beginning of semester 1, 2019

Table 4.2 Control Group: Beginning of Semester 1, 2019

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
1	10	12	20	9	9	5	5	8	13	14	18
2	8	7	13	4	2	3	2	2	5	9	18
3	11	14	8	6	6	12	8	13	11	6	7
4	11	9	4	5	12	12	11	10	11	8	7
5	13	8	9	13	16	14	18	19	12	6	2
6	6	7	2	7	4	13	9	4	6	6	5
7	6	11	6	12	14	11	7	10	6	10	10

Table 4.3 Experimental Group: End of Semester 1, 2019

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q1	Q11
1	0	0	0	0	0	2	0	0	0	2	2
2	0	1	0	1	0	0	0	0	2	0	0
3	4	0	2	0	2	0	12	4	0	0	0
4	6	4	6	2	5	20	16	11	7	4	10
5	23	24	32	21	5	13	12	10	30	4	1
6	19	19	16	21	33	21	23	31	28	26	31
7	42	46	38	49	49	38	31	38	27	58	50

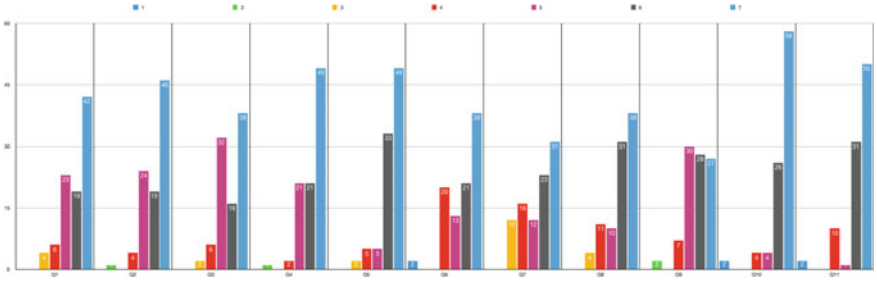

Fig. 4.5 Likert scale response frequency for each survey question for the experimental group at the end of semester 1, 2019

Fig. 4.6 Likert scale response proportion for all survey questions combined for the experimental group at the end of semester 1, 2019

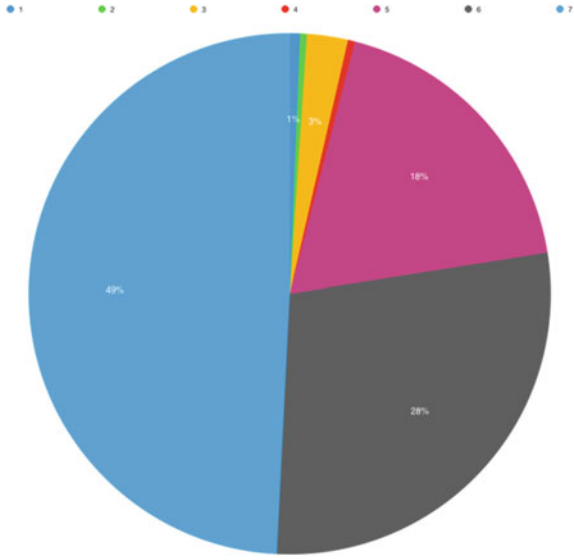

Table 4.4 Control Group: End of Semester 1, 2019

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
1	8	9	17	8	9	5	5	8	13	13	14
2	10	12	15	6	3	5	5	4	8	11	21
3	13	12	9	7	7	9	13	9	11	10	7
4	7	4	5	10	10	9	9	13	8	9	5
5	15	8	7	14	18	13	17	16	12	6	2
6	4	8	4	7	4	12	7	4	5	4	5
7	4	8	4	9	10	8	5	7	4	8	7

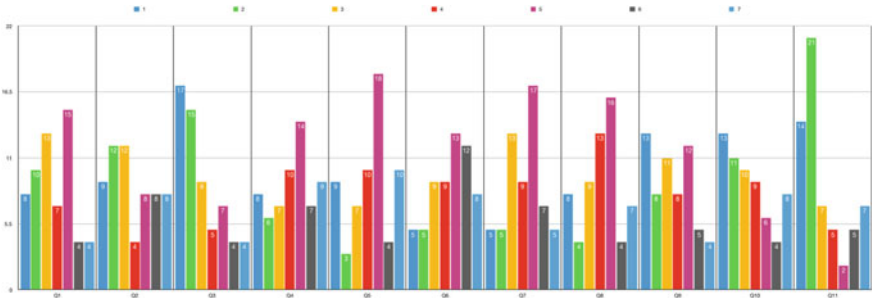

Fig. 4.7 Likert scale response frequency for each survey question for the control group at the end of semester 1, 2019

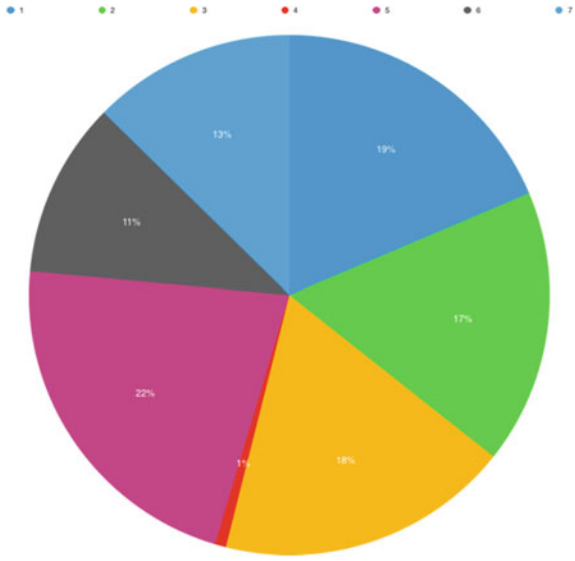

Fig. 4.8 Likert scale response proportion for all survey questions combined for the control group at the beginning of semester 1, 2019

Table 4.5 Printing Data: First Semester of Degree for the Control and Experimental Groups

	2018 control group: total	2018 control group: per capita	2019 experimental group: total	2019 experimental group: per capita
Overall Printing	11732	65.9	4377	23.7
Black & White ($0.08 each)	10158	57	3073	16.7
Colour ($0.40 each)	1574	8.8	1304	7
Overall Costs	$1420.00	$7.98	$729.12	$3.96

Table 4.5 displays the printing data for the control group (n = 178; taken from semester 1, 2018) and the experimental group (n = 184; taken from semester 1, 2019).

Figure 4.9 displays the comparison in per capita printing quantity between the control group (drawn from semester 1, 2018) and the experimental group (drawn from semester 1, 2019).

Figure 4.10 displays the comparison in per capita printing costs between the

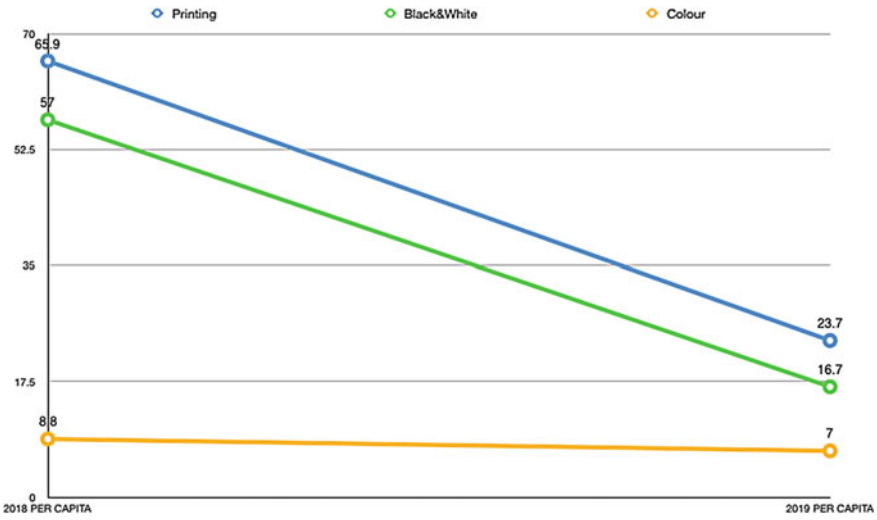

Fig. 4.9 Printing quantity comparison for the first semester of degree for the control and experimental groups

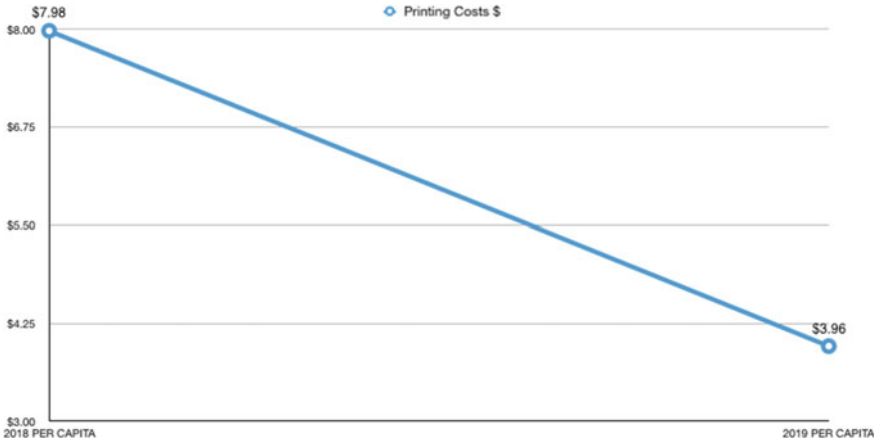

Fig. 4.10 Printing costs comparison for the first semester of degree for the control and experimental groups

control group (drawn from semester 1, 2018) and the experimental group (drawn from semester 1, 2019). The control group data was drawn from 2018 and the experimental group data was drawn from 2019, so the graph depicts a decrease in printing quantity, especially for black and white imprints.

4.6 Data Analysis

The analysis will, in order, parse start-of-semester and end-of-semester findings for the experimental group, followed by the same findings for the control group.

4.6.1 Experimental Group

The responses given by the experimental group at the beginning of semester 1, 2019 revealed that level 5 on the Likert scale was the mode for six of the 11 questions. Level 5 on the Likert scale was also the most commonly selected rating across the 11 questions combined, followed in order by 7, 6, 4, 3, then 2 and 1 tied. Across all 11 questions, 57% of responses were above the Likert scale midpoint (4) and 30% of responses were below the midpoint, with 13% choosing the midpoint. Therefore, overall, the experimental group's degree of self-efficacy at the beginning of the study was narrowly above the median point (4) for most of the questions relating to their digital capabilities.

Question 5 elicited the highest number of positive responses, implying a level of confidence with participants' use of technology for identity and social networking purposes. Questions 1, 9, and 11 elicited the least positive responses. Two of these three questions addressed the use of technology for the participants' core academic activities, i.e. studying and teaching, so the fact that participants felt less efficacious in these processes showed a concerning level of insecurity at successfully employing technology for their learning. Less surprisingly, the question that brings into question the construct of innovation also displayed low levels of self-efficacy. This may be related to the semantic associations to innovation, which imply exceptionalism and invention. Confidence in innovation, one presumes, is less likely to be present in someone who is less confident in the use of the tools through which innovation takes place.

At the end of the semester, the same experimental group's responses showed level 7 on the Likert scale as the mode for ten of the 11 questions. After level 7, the most commonly selected levels were, in order, 6, 5, 3, then 1 and 4 tied. Across all 11 questions, 95% of the given responses were above the Likert scale midpoint (4) and 5% of responses were below the midpoint.

Question 10 elicited the highest number of positive responses, whereas question 7 elicited the least positive responses, though even in that case the responses were above the level 4 midpoint.

There were significant differences in the responses given by the experimental group when comparing the beginning of semester 1 and the end of semester 1. The pre- and post-change for all questions combined showed a 28% movement towards the higher end of the Likert scale—a sizeable shift.

The most improved question (Question 10) pertained to participants' confidence with using technology for their studies. Even the question that had elicited the most negative responses at the beginning of the semester (relating to innovation) saw an average shift of 15% towards the higher end of the Likert scale. There was a concrete improvement in the experimental group's self-efficacy in relation to their digital capabilities across the duration of the study. This improvement was clear across all questions, but it was most marked with the questions relating directly to students' confidence in using technology for learning.

4.6.2 Control Group

Responses given by the control group at the beginning of semester 1, 2019 selected level 5 on the Likert scale most frequently overall, followed in order by 1, 7, and 3 tied, and then 2, 6, and 4. Across all 11 questions, 50% of responses were above the Likert scale midpoint (4) and 49% of responses were below the midpoint. Similarly, to the experimental group, at the beginning of the academic year, level 5 on the Likert scale was the mode for six of the 11 questions. Question 6, about online research, elicited the highest number of positive responses, while questions 3 and 11, concerned with the use of technology for collaboration and teaching, elicited the least positive responses. At the start of the semester, a higher proportion of responses in the control group were confident at using technology to name reliable information online compared to the experimental group. Self-efficacy in this skill, which involves various processes including sourcing and referencing online library resources, was higher among Year 2 students than among Year 1 students.

At the end of the first semester of Year 2, the control group's responses still revealed level 5 on the Likert scale as the mode for six of the 11 questions and, most often, overall. Question 6 elicited the highest number of positive responses, while questions 3 and 11 elicited the least positive responses. Across all 11 questions, 46% of responses were above the Likert scale midpoint (4) and 54% of responses were below the midpoint, with very few responses choosing the midpoint. This data showed minor change between the beginning and end of the semester, with a slight deterioration in overall self-efficacy.

Finally, it is worth noting that the results offer convincing statistical validity to the survey design. Qualitatively, the questions cohered due to their provenance from JISC and thereafter the Adelaide University graduate attributes. This semantic validity was backed up by a quantitative analysis. The response data, when passed through

an exploratory factor analysis, delivered a 1 factor solution, which explained 69% of the variance for the experimental group and 77% of the variance for the control group. Factor loadings for the experimental group, according to Cronbach's alpha analysis, reached 0.953 for a single factor solution with the experimental group and 0.969 for a single factor solution with the control group. Considering the single factor coherence of the 11 survey questions, it was possible to apply a summated rating scale to determine differences between the responses. This statistical analysis revealed a rounded 15% overall difference between the end of semester results for the experimental group, but barely any difference for the control group. The experimental group's shift was a statistically significant improvement, which highlighted that the experimental group's self-efficacy regarding their digital capabilities had meaningfully and markedly improved over the first semester and in comparison with the control group.

4.7 Discussion

The key question at play in this paper is whether there is a relationship between the eLearning Programme and the digital self-efficacy of the participants. To determine this, it is necessary to pay attention to the results at the question level. The experimental group reported a much greater degree of self-efficacy in relation to their digital capabilities. The difference between the experimental and control groups was clear and significant across all questions. The greatest difference between the experimental group and the control group was found in questions 1, 2, 4, 5, 10, and 11, all of which had a Likert scale level 7 of at least a 20% higher incidence rate for the experimental group compared to the control group. These questions addressed a broad range of digital capabilities, including productivity and the ability to self-learn new technologies. Among the questions, the ones that registered the most differences between the experimental and control groups were questions 10 and 11, which directly addressed using technology to learn and teach. These two questions were most explicitly relevant for the focus of this study, which aimed to determine the relationship between a specific intervention and PSTs' ability to learn and teach via technology. Therefore, the improvement in questions 10 and 11, which saw a 30% increase in Likert scale level 7 responses, implied a successful outcome (according to the aims of the eLearning Program) after one semester of intervention.

Correlation, of course, does not equate to causation. The fact that the experimental group, after one semester of the eLearning Programme, registered significantly higher self-efficacy regarding their digital capabilities, whereas the control group's responses saw no change, does not in itself mean that the eLearning Programme improved said students' digital capabilities. However, attributing this improvement to the eLearning Programme becomes more persuasive when other contributing factors are taken into consideration. First, the design of the research discounted several significant variables. Both the experimental group conducted the same courses, with the same assessments, during the first semester of Year 1. The Year 1 students (the

experimental group) had not yet experienced Year 2 courses (which the control group were taking part in), but it was difficult to determine how this could have contributed to the results. The control group's prior responses at the beginning of the sampled semester were remarkably similar to the experimental group's responses. The responses for the control group remained stable, suggesting that they might have remained at similar levels since the beginning of their degree. It was only the experimental group's responses that changed, improving dramatically over a semester. The most noticeable difference in the learning experiences of the two groups was the eLearning Programme's intervention, which was a meaningful contributor to the experimental group's improvement in their digital capabilities.

Printing data also points to the impact that the eLearning Programme's intervention had among the participants. The experimental group's printing over the first semester of their degree (which took place in 2019) was around a third of the control group's printing of the first semester of their degree (which took place in 2018). Considering that, apart from the introduction of the eLearning Programme, there was no substantial change to the first-year programmes across 2018 and 2019; this difference is significant.

In addition, colour printing was remarkably similar for both the experimental group and the control group. If one can presume that colour printing is completed for resources that have visual language, as opposed to simply word-processed resources, then the reduction in printing for the experimental group was due to a reduction in the use of text-based hardcopy resources. In other words, the experimental group stopped printing when there was no functional advantage to printing but continued to print when the resource's colour enhanced its effect.

These findings are obliquely situated among the current research voices of the field. On one hand, the ostensibly positive effects of the eLearning Programme cohere with the recent findings of Sanchez et al. (2020). When exploring the effect of a BYOD model in a tertiary education context, the authors found that the presence of personal mobile devices helped students find more motivation and autonomy in their learning. In a similarly structured case study, Saha and Deb (2020) also find that tertiary students are better able to participate and engage in digitised learning activities. Even when focusing on standardised testing of digital capabilities, as Safar (2018) did, recent research indicates that mobile devices lead to better results. Agreeance on the positive effect of 1:1 models is however not unanimous, as evidenced by the work of Welsh et al. (2018). Sampling students in the UK in a non-compulsory BYOD context, the authors discover that mobile devices hinder collaboration. Interestingly, the main problem that the researchers identified was the inequality of access to mobile devices, which they argued was the main cause of the loss of collaboration among students.

The studies above create a context that this research mostly confirms. The presence of a 1:1 device model throughout a learning programme tends to enhance students' digital capabilities and engagement with learning—as long as equity of access and support in learning are maintained. The fact that all participants in this study had access to the same device removed the inequality that Welsh et al. (2018) highlighted as being particularly problematic. This research therefore reinforces the finding that

1:1 device models must prioritise equity of access to hardware and software in order to facilitate desirable learning outcomes. Furthermore, this research is original in its ability to describe the effect that introducing 1:1 iPad devices has on the digital capabilities of pre-service teachers. The findings point to unequivocally positive results. Providing equitable access to iPads and embedding the devices throughout Initial Teacher Education courses has the effect of enhancing digital capabilities of pre-service teachers.

4.8 Conclusion

Answers to the three research questions are as follows:

RQ1: What is the difference in the digital capabilities of first-year BTeach PSTs (the experimental group) at the beginning of and after one semester of exposure to the eLearning Programme?

The experimental group who took part in the eLearning Programme significantly increased their self-efficacy regarding their digital capabilities across one semester of study.

RQ2: What is the difference in the digital capabilities of second-year BTeach PSTs (the control group) at the beginning of and after one semester without exposure to the eLearning Programme?

The improvement recorded by the experimental group was not observed in the control group, who had not participated in the eLearning Programme and whose self-efficacy in relation to their digital capabilities remained stable. Because self-efficacy is a reliable measure of ability, the experimental group had, therefore, improved its digital capabilities both on its own terms and in comparison to the control group.

RQ3: What is the difference in the per capita printing quantity of the first-year BTeach PSTs (the experimental group) and the second-year BTeach PSTs (the control group) during semester 1 of their first year of studies?

The printing quantity of the experimental group was also markedly lower than that of the control group, cohering with the survey results. Considering the limited range of extraneous variables between the experimental and the control groups, it is reasonable to conclude that the eLearning Programme was the key intervention that led to the improvement of digital capabilities and a reduction in printing.

We have established that there are considerable difficulties met in the successful use of digital technologies in educational contexts (Cochrane et al., 2014; Farley et al., 2015; PISA, 2015; Selwyn, 2017). This reality makes the findings of this case study significant and somewhat remarkable. This study revealed a mode of intervention that has made a significant contribution to both the digitisation of workflows and to a broad range of digital capabilities of PSTs. The said intervention, the eLearning Programme at the School of Education of the University of Adelaide, presents as a multifaceted

project that involved both PSTs and their academics, and sought to provide support on several fronts. Interventions addressed technical, learning, and pedagogical needs, as well as instigated changes to course design, assessment, learning spaces, and in-school practicums. Rather than pinpointing one specific aspect, it is the comprehensive approach employed by the eLearning Programme in this case study that helped secure the improvements to digital capabilities among PSTs.

These findings supply evidence of interest to any educational organisation intent on enhancing the way personalised technologies can benefit learning and teaching. The results highlight the need to devise a comprehensive and coordinated approach that elevates the role of technology in a broad variety of aspects of learning and teaching. The need, in other words, is to build a culture of high-quality technology implementation, rather than to simply tag an accessory onto the status quo.

Among the limitations of these findings, the narrow scope of its sample is most prevalent. Further research, particularly if longitudinal in nature and if embedded in the broader PST practices of school practicum and even early career teaching, is therefore likely to bear more generalisable results.

Ethics: This study was approved by the University of Adelaide's Office of Research Ethics, Compliance and Integrity (Approval No: H-2018-280).

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Appendix 1

Established in 1993 as a membership organisation across several tertiary institutions in the United Kingdom, JISC has developed a range of frameworks to parse the interplay between technologies and both industry and education partners (Read, 2012). Of most interest to this study are the three frameworks that JISC has developed in relation to digital capabilities for teachers, learners, and educational institutions, which it defines as 'the capabilities fit for someone living, learning and working in a digital society' (Beetham, 2017). These JISC frameworks were mapped against the Certified Member of the Association for Learning Technology framework as well as the UK Professional Standards Framework and were validated by studies exploring their applicability in tertiary institutions (Molloy, Hodson, Poschen, & Tedds, 2013). The three learning technology frameworks propose six elements to digital capabilities:

- ICT proficiency
- Information, data, and media literacies (critical use)
- Digital learning and development (development)

- Digital creation, problem solving, and innovation (creative production)
- Digital communication, collaboration, and participation (participation)
- Digital identity and well-being (self-actualising).

While each of these elements is identified as a distinct entity, JISC highlights their complementary and interrelated nature. To suit its local context, the University of Adelaide adapted the JISC digital capabilities frameworks to arrive at the Adelaide Digital Capabilities Framework (Bailey et al., 2017). Similar to the JISC framework, the Adelaide Digital Capabilities Framework features six elements:

- ICT proficiency and productivity
- Information, media, and data literacy
- Digital learning and development
- Digital creation, problem solving, and innovation
- Collaboration, communication, and participation
- Digital identity and well-being.

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Chapter 5
Blended Learning Needs Blended Evaluation

John Willison

Abstract There are many evaluation frameworks for blended teaching; however, there are few suitable frameworks for Blended Learning (BL). This chapter presents an evaluation framework that was designed to span school and university BL, including Initial Teacher Eduction (ITE). An appropriate evaluation framework must show how effective each BL design and implementation is, at the level of a term or semester of study, and at the larger scale, such as across primary, middle, or secondary school, or programmes of study such as an ITE bachelor or master's. This chapter first identifies eight features from the literature that are necessary for a BL evaluation framework, and shows that existing models do not satisfy these requirements. Next, the chapter introduces the Blended and Engaged Learning Zones (BELZ), designed specifically for BL across schooling and university studies, and that satisfies these eight features. An example follows of a version of BELZ used to evaluate BL in the years prior to a substantial three-term long inquiry task. BELZ addresses the imbalance in the literature, as well as the needs in teaching practice, for an evaluation framework for BL across schooling and university study.

Keywords Blended evaluation · Blended learning · Higher education · Professional development of educators · Teacher education

5.1 Introduction

The provision of online learning environments in schools and universities globally during COVID-19 shutdowns has left students and educators alike appreciating both the potential and the pitfalls of online-only learning. As students return to classrooms, they are likely to experience a more intentional blending of face to face and e-learning than previously. However, how effectively will blended provisions enhance educational outcomes? This chapter critiques existing frameworks that are used to determine the effectiveness of courses that blend learning and proposes a bespoke

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framework that was designed to evaluate and enhance school, university, and ITE student learning outcomes in blended learning environments.

The most important Blended Learning (BL) occurring in universities is, arguably, that which is designed and delivered during ITE. ITE not only provides for the learning of PSTs, but also acts for them as a model for how teaching may occur when in schools during their professional experience and after graduation. A substantial impact on the effective use of educational technologies for early career teachers is known to be mediated by their experiences in ITE (Hasse, 2017). These experiences include access to relevant technologies and especially the nature of facilitated learning about, and through, the use of educational technologies while at university and during school placements (Stone, 2017). Early career teachers who have already developed blending-savvy pedagogies are especially well placed to have a substantial influence on the schoolwide use of learning technologies (Jansen & van der Merwe, 2015). BL in ITE, therefore, has a substantial rippling of influence from university into schooling.

The blending of e-learning with other modes of learning is almost ubiquitous in schools and universities in various regions and countries but varies in effectiveness (Vo, Zhu, & Diep, 2017). Evaluation frameworks have emerged from face-to-face traditions and e-learning traditions, but blending these is something different again and bespoke blended-savvy evaluations are needed. An evaluation framework must capture the effectiveness of the blend, not just of the parts that are blended. In addition, an evaluation of BL in ITE requires a framework that spans school sectors and university study, and thus provides insight into outcomes of both ITE student learning and ITE graduates' own school students' learning. Given the diversity of implementations across numerous school types and countries, it is not surprising that studies have found substantial variability in the effectiveness of BL initiatives (Selwyn, Nemorin, Bulfin, & Johnson, 2017; Zhang & Zhu, 2017). Frameworks to evaluate BL are a crucial part of ensuring that the blend works for students and not incidentally tangled but rather intentionally braided. Each mode in BL must not only be effective, then, but it must also interact with other modes. For example, if an online virtual laboratory is used to augment a hands-on experiment, a corroboration of equipment, terminology, and aims that connect both modes must be evident to students. BL modes should mutually reinforce and strengthen what would otherwise be offered in one mode only.

In this chapter, the working definition for BL is the co-existence or integration of e-learning and other modes of learning, accounting for blended design that ranges from coincidental to pedagogically entwined. This definition suits the range of experience in schools globally; because while e-learning is virtually ubiquitous in many countries (OECD, 2015; Paiva, Morais, Costa, & Pinheiro, 2016), the level of integration of the blending varies markedly. BL may be as simple as students engaging with a digital reading in a physical classroom or a digital pH meter hooked up to a computer in a physical laboratory. BL may also involve multiple aspects pedagogically blended together, for example, students with tablets controlling robots via their own programming, recording this digitally, and uploading their results for others to peer review, post comments, and then discussing as a whole class face to face.

This chapter proceeds to consider existing evaluation frameworks that may be used for BL, and their shortcomings. It then presents a framework for evaluating BL that overcomes these shortcomings and an example of its use in school education.

5.2 Existing Evaluation Frameworks for BL

Numerous studies have evaluated BL at universities (Boelens, De Wever, & Voet, 2017; Bowyer & Chambers, 2017; Chmiel, Shaha, & Schneider, 2017) and in ITE specifically (Francom & Moon, 2018; Zhou & Chua, 2016). A variety of approaches and pedagogies inform BL design including those involving problem solving, critical and creative thinking, evidence-based decision-making, researching, inquiring, investigating, puzzle-based learning, challenge-based learning, and project-based learning, to name a few, as well as blending that happens without a clear approach or planning. These varied approaches emphasise differences in student learning outcomes (Coates, 2016); however, there is sophisticated thinking in common among them, thinking that requires cognitive and affective skills (Willison, 2020), and these skills are explored in more detail later in the chapter.

While frameworks suitable for guiding pedagogy and evaluation have been emerging for e-learning over the past three decades (Laurillard, 2005) and for BL in the past two decades (Derntl & Motschnig-Pitrik, 2004), there are several limitations to these frameworks that reduce their capacity to provide teachers and schools, lecturers and universities with adequate information to improve student learning via blended modes. This chapter looks at the deficits of existing frameworks and then presents a model that has an ancestry spanning twentieth-century and twenty-first-century educational research, which was crafted to explicitly capture and guide pedagogy for, and evaluation of, BL. This chapter aimed to overcome the current limitations of evaluation frameworks for BL by presenting a Blended and Engaged Learning Zone (BELZ), a framework with an ancestry and currency for providing insights into diagnosing and improving student learning.

5.2.1 Issues for, and Characteristics of, BL Evaluation Framework

There are numerous issues identified in the literature that concern BL and its evaluation, and these must be heeded and accommodated in a BL framework that has the following characteristics.

5.2.1.1 Focuses on Student Learning Rather Than Design Inputs

The first issue regarding existing frameworks that may be otherwise suitable to evaluate BL is that many of them consider the evaluation of inputs but pay insufficient attention to learning processes and outcomes. For example, a recently published guide on BL (Cleveland-Innes & Wilton, 2018) noted that the following four general factors must be represented in the design and evaluation of BL: the pattern of delivery mode, which sequences and combines activities; the materials, technology, and media used; the use of varying pedagogical models; and the temporality of synchronous and asynchronous methods. This is heavily input oriented. In the peer-reviewed literature, the trend is the same. BL evaluation frameworks have focused on inputs such as a rubric for course design (Smythe, 2012) and, more recently, 'a flexible and transferable evaluation framework that can be used to support the *introduction and implementation* of BL…' (Chmiel et al., 2017, p. 177).

The propensity to focus on inputs for BL evaluation leaves us with insufficient evaluative power to determine the actual effect of BL in terms of student learning. Moreover, a literature review of BL evaluation (Cappi et al., 2019) noted an over-reliance on student self-evaluation and that observed performance correlates poorly with such self-evaluation. The review concluded that a more rigorous evaluation of learning outcomes of BL is needed in terms of student skills and their application to practice. Another study concluded that BL evaluation should be 'focused on the *learning process* …' (Pombo & Moreira, 2012, p. 208, italics added). A focus on student learning processes suggests evaluation that is incremental and cumulative, rather than merely end-on or input-oriented. A recent book, *Essentials for blended learning: A standards-based guide*, (Stein & Graham, 2020, p. 92), notes that blended learning courses need to determine 'student attainment of learning outcomes by examining student performance either directly (e.g. by observation) or indirectly (e.g. by an exam)'. Yet in a section on a 'Strategy of iterative development' (p. 73), evaluation of the blended learning programme is noted as important but relies on student surveys.

Well resourced, brilliantly designed, blended courses can have a powerful evaluation of inputs but fail to deliver the learning outcomes sought. In a student learning-focused BL, evaluation can help diagnose aspects of blending that require attention. Evaluation of cohort learning outcomes feeds back, or should feedback, into the course inputs, but with far more nuance and sophistication than a design merely set in motion could provide. Evaluation questions include 'what is the learning movement of a cohort over time?' and 'where is the evaluation loops in which various forms of data are fed back in?'

Several popular frameworks that could inform Blended Learning evaluation are very effective for thinking about curriculum design, but are not effective for the evaluation of student learning outcomes. The SAMR model (Hamilton, Rosenberg, & Akcaoglu, 2016; Puentedura, 2013) provides thought-provoking and helpful guidance to teachers about the design of e-learning. However, it does not provide evaluative guidance about how effectively students may have worked at the top 'redefined' level of SAMR. While 'redefined' is a pedagogical attempt to make the most of the

potential latent in e-learning, the actual learning that results may be powerful and multifaceted, or it may be fuzzy and weak. Likewise, a well-designed activity at the SAMR level of 'substitution' may merely swap some e-learning into a teacher's previously well-designed face-to-face only task, but still may provide powerful learning that fosters multifaceted learning for students. In other words, the SAMR framework guides the teacher and is effective for the evaluation of inputs, but it does not provide for an evaluation of the effectiveness of the design in terms of student learning outcomes. Building on pedagogical content knowledge (Shulman, 1986), the technological pedagogical content knowledge (TPCK) model (Mishra & Koehler, 2006) guides the thinking that teachers use to acquire and design effective e-learning alone and as BL. With its focus on pedagogy and teacher design, similar to SAMR, TPCK is not suitable as a BL evaluation framework that provides insights into learning outcomes.

5.2.1.2 Spans Paradigms and Theoretical and Pedagogical Perspectives

The second issue concerning BL and its evaluation is that theoretical and conceptual frameworks, when used intentionally, determine the nature of BL. For example, Cognitive Load Theory (Sweller, 1988; Sweller & Paas, 2017) and Direct Instruction (Stockard, Wood, Coughlin & Rasplica Khoury, 2018) portray the vital role of structured learning that is prescribed by the informed teacher who knows what students are to learn and how they may best inculcate that learning. Knowledge acquisition as foundational, and sequentially prior, to all other aspects of learning is emphasised. This knowledge-as-foundation heavily influences the e-learning provided and its intersection with other modes of learning. Cognitive Load Theory and Direct Instruction act as conceptual frameworks for BL design and evaluation, whereby students are thought of as less able to engage in autonomous learning until a certain amount of minimum knowledge and skill sets are acquired.

From a very different perspective than the above, Social Constructivism (Piaget, 1964; Varthis & Anderson, 2018; Vygotsky, 1980) and Connectivism (Siemens, 2005; Wang, Anderson, & Chen, 2018), both provoke the scope and creativity of being led by student curiosity, intrigue, passion, challenge, or problems. The high level of student autonomy emphasised by these conceptual frameworks means that knowledge predetermined by the teacher is not a foundation or sequentially first, rather knowledge is sourced when required from less predictable locations. From this perspective, student knowledge construction is non-linear, unpredictable, and not hierarchical. The term 'higher-order' learning invokes a *hierarchy* for more substantial, effective, and sought-after learning, from bottom to top, for example from knowledge to evaluation in Bloom's (1956) taxonomy. However, learning may be considered richer when *multifaceted*. Multifaceted thinking involves a variety of sometimes inseparable cognitive skills and affective elements (Willison, 2020), and is discussed below.

As Cognitive Load Theory and Constructivism sit at different ends of an education theory spectrum, supporters of each are wary of the others (Kirschner, Sweller, &

Clark, 2006; Hmelo-Silver, Duncan, & Chinn, 2007); however, both perspectives may provoke powerful learning outcomes from well-designed BL. An evaluation framework must accommodate both ends of this spectrum and anywhere in the middle because these diverse theoretical and conceptual perspectives are current, prevalent, and heavily influential. An in-common evaluation framework enables each perspective to speak to the others, and such conversation may open new and more effective ways of BL. Moreover, a framework that spans perspectives can provide insight into the strengths and weaknesses of practical applications of each theoretical perspective.

5.2.1.3 Designed a Priori to Determine the Effectiveness of BL

Another issue for the evaluation of BL is that an evaluation framework needs to be designed from the beginning with blended learning in mind, requiring the following:

(a) *Categories do not separate e-learning and other modes of learning*

A framework to evaluate BL should have e-learning and face-to-face aspects blended together, not as separate components. It is the way that e and non-e components work together to inform and influence student learning because the blending provides more than the sum of the parts.

(b) *Not hierarchical*

Hierarchical frameworks favour a more linear and direct approach than engagement in sometimes unpredictable blended environments. For much BL, *multifaceted* thinking (Willison, 2020) may be a more appropriate term to convey 'sophisticated thinking' than *higher-order thinking*. This is because *higher-order* implies a linear, teacher-directed movement towards the top rung, whereas *multifaceted* thinking is richer, more balanced, and true to the complexities of learning, which requires several facets to be addressed simultaneously. Hierarchical models are not suitable for some of the messy, recursive learning that happens online and even less so when this is blended with other modes of learning. For example, Bloom's (1956) Taxonomy of the Cognitive Domain has, as its foundation, knowledge as a starting point from which students build. However, there are many other starting points with online access that require 'higher levels' of cognition, and online theorists see knowledge as distributed and accessible just-in-time (Siemens, 2005), rather than as a starting foundation.

(c) *Not sequential*

Many models are not hierarchical, but they follow a specific sequence that includes models that are 'cyclic', such as Kolb's Learning Cycle (Stice, 1987), which is, in effect, four steps and repeat. Sequential models are useful for teacher planning and introducing students to processes; however, they do not capture the non-linear, recursive, and unpredictable nature of BL as engaged in by students, meaning a BL evaluation framework must not be locked into a predictable 'building-on' approach.

An explicit pedagogy for blending is of paramount concern, and the conceptualisation of how to determine the effectiveness of this blending is a crucial factor in

this pedagogy. Across education, e-learning and other modes of learning are difficult to untangle in the timeframe of a day, week, term, semester, or year. Blending is not necessarily a conscious choice by teachers and so the question becomes 'how effectively is e-learning blended with other modes of learning?' Does the blend of various modes of learning lead school, ITE, and other university students to engage in multifaceted, sophisticated thinking and doing?

5.2.1.4 Accounts for the Cognitive and Affective Domains

The seminal works that differentiated and separated the cognitive and affective aspects of learning, Bloom's two taxonomies (Bloom, 1956; Krathwohl, Bloom, & Masia, 1964), recognised that this was an artificial distinction, useful for teacher understanding but not true of learning: 'The fact that we attempt to analyse the affective area separately from the cognitive is not intended to suggest that there is a fundamental separation. There is none' (Krathwohl et al., 1964, p. 45). In the ensuing decades, many have maintained the delineation as a reality, which has led to fundamental misunderstandings about the nature of learning, how learning takes place, measurement of learning, and evaluation of courses.

All learning requires a nuanced synergy of the cognitive and affective domains (Krathwohl et al., 1964) including in digital environments (Kiili & Ketamo, 2017) and in learning that blends the digital and physical (Černá, 2017). Therefore, determining the impact of educational technologies on learning environments that blend digital and physical learning requires a conceptual framework that can meaningfully encompass not only the digital and physical, but also the cognitive and affective.

5.2.1.5 Fruitful Across Subjects and Disciplines as Well as Across Educational Sectors, Initial Teacher Education, and in-Service Teacher Education

A BL evaluation framework must provide insight, not only into school student learning and in-service teacher professional development, but also into ITE, which in Australia occurs at both the undergraduate and master's level. For ITE master's students, the effectiveness of the blending in their undergraduate discipline-specific degree is of great importance. Likewise, for undergraduate ITE, undergraduate double degrees are common, where students study a discipline-oriented degree in addition to education, such as Arts, Business and Management, Engineering and Maths, or Science. Therefore, an evaluation framework must span the education sectors, subjects, and disciplines. An evaluation framework for ITE must also be flexible enough to accommodate learning in these broader contexts. The need for a blended pedagogy raises questions also about in-service teacher professional development. Therefore, evaluation must include how effectively ITE and in-service teachers' own learning is facilitated in blended environments (Francom & Moon, 2018), both as a modelling process and towards ITE students' and teachers' own enhanced blended pedagogy.

5.2.1.6 Does not Define Complex Skills with Other Complex Skills

The trend to develop digital literacy or digital capability descriptions (e.g. Dede, 2010) has resulted in frameworks with a mixture of characteristics and a complex bundle of skills. For example, typical digital literacy frameworks delineate the concept into sets of still-complex ideas (Littlejohn, Beetham, & McGill, 2012; Mishra & Pandey, 2019), almost always including information literacy (Bundy, 2004). However, information literacy is such a complex and contested term that merely adding it to a framework as an element leaves no realistic way of determining whether students achieve it and, therefore, no method of effective evaluation. Defining complex concepts like digital learning with other complex concepts, such as information literacy, does not provide a basis for an effective evaluation framework. Rather, such nested definitions mask the *overlap* between complex concepts and do not articulate processes students actually engage in or what the tangible outcomes of their learning may be.

5.2.1.7 Incorporates Explicitly Twentieth-Century and Twenty-First-Century Learning Models

While contemporary learning must be strongly foregrounded in twenty-first-century BL, much twentieth-century research still has descriptive power to explain a raft of learning. More importantly, however, is that twentieth-century understandings are still framing much of contemporary BL. Evaluation may be informed by observations of teachers or others, self-evaluation, and perceptions gleaned in surveys or focus groups.

Whatever the data and methodology employed, the need for a broad evaluative framework informed by both centuries is demonstrated by the concept of data analytics, where lots of data can be sourced via online participation and performance; however, the analysis depends on the analytical framework and questions asked. Early research in online-only learning highlighted the crucial nature of teacher presence for effective learning (Garrison, 2007), a finding that has been consistently backed up (Baker, 2010; Song, Kim, & Park, 2019), and thus data analytics should be treated as a tool for, not a dictator of, BL evaluation. The tendency towards an automisation of evaluation, such as in data analytics, risks a depersonalisation of teaching and learning, whereas learning is a deeply social activity and depersonalisation is a big risk factor for student ownership of learning (Song et al., 2019). The use of twenty-first-century learning models heightens this risk, and a BL evaluation framework that is savvy of pertinent twentieth-century models may balance out the risk of the impersonal.

Capturing, generating, or having lots of data about student engagement and performance is not, in itself, analytics. Data analytics involves the asking of intelligent question and answering these questions with reference to a variety of student and cohort data. Data sets can and do give rise to questions; however, the questions asked are

never neutral but rather influenced consciously or subconsciously by learning theories. The collection of data for data analytics may result in a lot of data but little knowledge about the effectiveness of BL in terms of tangible student learning outcomes unless it has a sound conceptual basis. To capture the diversity of what comprises blended learning, an evaluation framework, informed by a variety of learning models, is needed to inform the process.

5.2.1.8 Accommodate Student Need for Teachers or Experienced Peers to Be, at Times, Close by Pedagogically and More Removed at Other Times

Vygotsky's (1980) Zone of Proximal Development (ZPD) provides an understanding of how students may operate at higher conceptual levels via the 'proximity' of a teacher or experienced peer to provide the necessary guidance. At the same time, the ZPD suggests some 'distance' from the teacher or experienced peer to enable the student to make the learning their own. Connecting to Sect. 4.2.1.2 above, different learning theories give different emphases on proximity or distance. An evaluation framework for BL must account for proximal and distal parts of the zone.

Each of these eight aspects of the evaluation of BL must be accounted for, with the BELZ presented next as a bespoke model suitable for BL pedagogy and, most importantly, for the evaluation of the BL experiences of students.

5.3 Blended and Engaged Learning Zone

The BELZ (Table 5.1) is a conceptual framework that was devised specifically to inform and evaluate environments. It blends physical and digital learning and was designed to span primary school to postgraduate education (Willison, 2020; Willison & O'Regan, 2005). BELZ has a pedigree informed by some of the most broadly used educational research from 20 Willison, twentieth-century research (Biggs & Collis, 1989; Bloom, 1956; Kelly, 1955; Piaget, 1964, Vygotsky, 1980) and is a synthesis of these ideas as well as research that has strongly informed twenty-first-century learning in digital environments (Bundy, 2004; Siemens, 2005). BELZ is an adaptation of a well-cited (Willison & O'Regan, 2007), demonstrably effective (Willison, 2012), and constantly evolving framework called the Models of Engaged Learning and Teaching (Willison, 2020).

BELZ represents six *facets* of BL, each of which comprises a pair of cognitive skills, a guiding question or questions, and an affective aspect (see Table 5.1). These six facets are elaborated along the zone of *learning autonomy* in the matrix-shaped version to make the complete BELZ (see Table 5.2).

Drawing on Vygotsky, the 'zone' in Models of Engaged Learning and Teaching (MELT) is shown in Table 5.2, where the columns are from 'proximal' where there is close, directed support from teachers or informed peers, to 'distal' where students are

Table 5.1 BELZ facets comprising cognitive and affective elements

BELZ cognitive facet, associated questions, and details	**Affective *exemplar*** (Deficit) {Excess}
Explore and clarify *What is our purpose? How can we stay safe?* Students clarify their direction and determine their purpose for using digital technologies. Students anticipate ethical, cultural, and social issues including e-protocols, e-safety, digital well-being, profile, and footprint	***Empathetic*** (disengaged) {besieged}
Select and generate *What will we use?* Students select information and generate data and ideas using appropriate methods Choose fit-for-purpose digital technology	***Experimental*** (narrow-minded) {dithering}
Evaluate and reflect *What do we trust? What is effective?* Students determine the trustworthiness of sources, information, data, and ideas, as well as the appropriateness of different tools Students make their own thinking processes visible to understand and improve them	***Discerning*** (gullible) {pedantic}
Organise and manage *How do we arrange?* Students organise information and data to enable patterns/themes to emerge. Students manage themselves and team function using strategies and digital systems	***Harmonising*** (slapdash) {manipulative}
Analyse and synthesise *What does it mean? What can we make?* Students perceive themes or trends in information/data and synthesise new knowledge to produce coherent individual/team understandings. Students create mashups with physical and digital techniques to create new products, understandings, and solutions	***Creative*** (unimaginative) {esoteric}
Collaborate and communicate *How do we relate?* Students consider their teams and the audience to discuss, chat, listen, write, perform, respond to feedback, and present processes, knowledge applications, and implications of their artefacts. Students engage the audience through their products as well as using these for personal benefit	***Connected*** (aloof) {pandering}

themselves driving the learning. The part of the zone close to the teacher is labelled with the verb *emulate*, whereas the part that is more removed from the teacher is called the *initiate*. The in-between part of the zone is called *improvise*, typically with learning scaffolds and where the students have scope to *improve* within their teacher's parameters, much like jazz musicians work within the parameters of the score when they improvise. The student-oriented MELT representation of the ZPD,

Table 5.2 Matrix version of BELZ showing the six facets elaborated along the continuum of learning autonomy (simplified version)

← *Blended and Engaged Learning Zone* (BELZ) →

Digital Facets		*Emulate* Students respond to questions/tasks that are prescribed, to...	*Improvise* Students work within given boundaries, to flexibly ...	*Initiate* Students drive the learning, to...
Explore & Clarify *What is our purpose?* *How can we stay safe?*	Empathetic			
Select & Generate *What will we use?*	Experimental			
Evaluate and Reflect What do we trust? What is effective?	Discerning			
Organise and Manage *How do we arrange?*	Harmonising			
Analyse & Synthesise *What does it mean?* *What can we make?*	Creative			
Collaborate and Communicate *How do we relate?*	Connected			

then, is *emulate, improvise, initiate*, and this parallels the standard teacher-centric version of 'model, scaffold, fade' (Lane, Hays, Core, & Auerbach, 2013). The MELT focus is on capturing what students do in the fullness of learning, thus providing a *continuum of learning autonomy* as an operationalisation of ZPD that is suited to learning generally and BL process and outcomes in particular.

This consideration of learning autonomy is a major design feature for BELZ to be used across formal education, including schooling, undergraduate and master's-level ITE, and in-service teacher PD. This is because 'autonomy' is not an attribute to be acquired (Willison, 2020), but is concerned with the relationship between each student, their learning context and teacher, and the concepts and skills to be used or developed. BELZ represents the essential nature of recursive movement in learner autonomy much like the ocean, from low tide to high tide and back to low tide (Willison, Sabir, & Thomas, 2017).

BELZ allows for the evaluation of student learning autonomy, not as an absolute entity or a characteristic of a learner, but rather as a sense of movement from low autonomy to high autonomy and back again as appropriate and as occurs across the many years of formal education. In BL, there is an opportunity to provide kindergarten students with the scope to operate at a high level of autonomy for a while and when it is safe. Some students will make the most of this and initiate learning, others will seek for some parameters and improvise within them, and some may want prescriptions to follow. One of the implications is that BELZ is effective for determining a shift in student autonomy and on that basis determining how effectively the BL environment helps students take ownership of their learning in a specific context. BELZ firmly

places highly guided learning, where students *emulate,* as part of the engaged learning continuum, as part of the zone in which students *initiate.* The question becomes 'how much structure and guidance do students need at any one time?'

BELZ explicitly addresses the eight vital aspects of an evaluation framework needed to be suitable for BL, as shown in Table 5.3. Using BELZ in terms of a blended inquiry mode, teachers are provoked to thoughtfully diagnose where students are situated for each facet in terms of student autonomy. The range of student capacity for inquiry mode in this diagnosis raises numerous questions.

Evaluative questions include how effectively the experienced curriculum promotes

1. Student cognitive and affective outcomes.
2. Student metacognition:
    a. How well does the curriculum promote student *awareness* of their own thinking processes as individuals and as teams?
    b. How well does the curriculum promote student *regulation* of their thinking processes, especially to improve their learning and ultimately the things they make and do?
3. Student meta-affection (awareness of their values, attitudes, and emotions):
    a. How well does the curriculum promote student recognition of the affective domain (including deficits and excesses) and its role in their learning?
    b. How well does the curriculum promote student recognition of their own deficits and excesses in the affective domain?
    c. How well does the curriculum promote student regulation of and growth in the affective domain?

The focus of this chapter was on evaluation; however, BELZ can be used to inform pedagogy, prompting the planning of curriculum with reference to student autonomy. Versions might also be used directly with students to inform their thinking about their online learning (see Fig. 5.1).

5.3.1 Example of BELZ Use for Evaluation

A version of BELZ was introduced in a two-hour workshop to teachers of the three-term long personal project in the International Baccalaureate (IB). The teachers' Year 9 students were poised to commence this major research project. The teachers were asked to use their professional judgement of the readiness of students to engage in their personal projects with relation to BELZ facets and learner autonomy. Table 5.4 provides an indicative example of a teacher's reflection on their class preparedness for the Research Project. There was in each workshop a large variation, teacher by teacher, in the percentages for emulate, improvise, and initiate, facet by facet.

Table 3 Features of BELZ

Feature required in a BL evaluation framework (identified above)	Features of BELZ
i. Focus on learning outcomes, not design inputs	The facet verbs convey what students do. The facet questions guide their thinking, planning, acting, and creating as outcomes and the evaluation of learning outcomes. As each facet is elaborated along the continuum of learning autonomy, BELZ provides the continuum mentality of OBE
ii. Spans paradigms and theoretical and pedagogical perspectives	The BELZ zones accommodate a wide range of epistemological and pedagogical positions in a non-value laden way
iii. Is designed a priori to determine the effectiveness of BL and is not hierarchical or sequential	Each individual facet has e-learning and face-to-face learning incorporated. BELZ has no fixed configuration, with the pentagon version (Fig. 5.1) portraying no sequence or hierarchy and just a guiding motto 'when in doubt go to the centre'
iv. Accounts for the cognitive and affective domains	Each facet explicitly incorporates cognitive and affective domains, where each speaks to, and reinforces, the other
v. Is fruitful across subjects and disciplines as well as across educational sectors, ITE, and in-service TE	Has been used extensively in undergraduate, master's, and Ph.D. (Willison, 2020), and more recently in primary and secondary schooling. This scope across formal education was designed and portrayed from the beginning (Willison & O'Regan, 2005) In university studies, BELZ has been used and evaluated from Accounting to Zoology and in-between (Willison, 2012) and interdisciplinary (Venning & Buisman-Pijlman, 2013)
vi. Accommodates student need for teachers/experienced peers to be close at times or more removed at other times	Learner autonomy in BELZ is explicitly portrayed as a continuum from *emulate* to *improvise* and *initiate* *Emulate*, the teacher or experienced peer is close and the student has a lower level of autonomy. *Improvise*, the teacher is distant and the student has a higher level of autonomy
vii. Does not define complex skill sets with other complex skill sets	The six BELZ facets, while interconnected, have minimal overlap when compared to complex skill sets such as digital capabilities and information literacy
viii. Incorporate explicitly twentieth-century and twenty-first-century learning models	Design includes Dewey (1904), Kelly (1955), Piaget (1964), Vygotsky (1980), Bloom (1956), Krathwohl, Bloom, & Masia, (1964) and Sweller (1988) from the twentieth century. Includes Bundy (2004) and Siemens (2005) from the twenty-first century

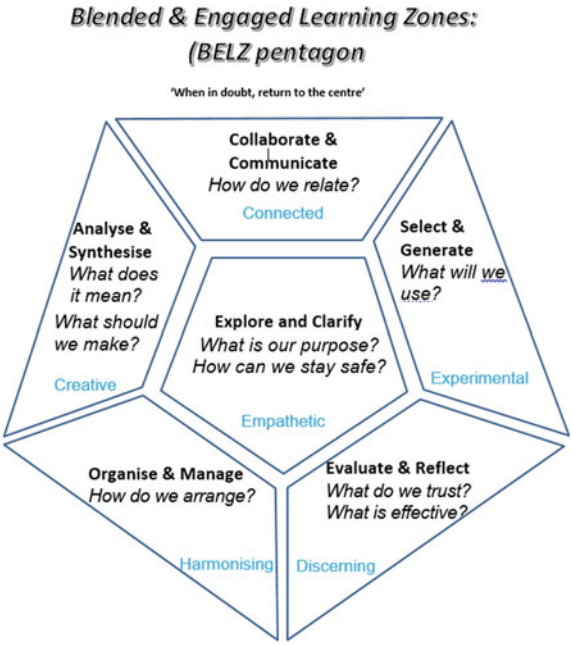

Fig. 5.1 A pentagon version of BELZ, a format made by students for student learning

Percentages varied greatly context by context, and teacher by teacher (Table 5.4). The evaluation of student readiness to engage in blended investigative learning provoked thoughtful evaluative considerations including

- The suitability of the curriculum and teaching up to the time of the workshop (e.g. end of the second term of Year 9) to prepare students for a major investigative project.
- The extent to which modelling and scaffolding may need to be provided to some students.
- How to manage such differentiated outcomes of student learning up to that point?
- What needed to be adjusted in the curriculum for subsequent cohorts?

Using BELZ to consider student learning outcomes with reference to an impending and major task prompted the prospective and retrospective evaluation of the curriculum and pedagogy. This was retrospective, in that it provided information on what the curriculum had done for students in preparing them for a major inquiry. The evaluation illuminates what needed to happen differently for the next cohort if more students were to be thoroughly prepared. Just as important, prospectively, the curriculum to support the students during their research project could also be scrutinised with respect to how well it would address the needs of those students. For example, the teachers could ask what was in place from term 3 to support those students who were perceived to be unable to initiate the identification of an issue to investigate, and would need teacher guidance and modelling for the students to

Table 5.4 An indicative teacher evaluation of a specific year 9 Cohort's preparedness for major inquiries of three terms length

Blended and engaged learning zones (BELZ)			
Digital facets	Emulate (%)	Improvise (%)	Initiate (%)
Explore and clarify What is our purpose? How can we stay safe?	60	20	20
Select and generate What will we use?	30	30	40
Evaluate and reflect What do we trust? What is effective?	70	20	10
Organise and manage How do we arrange?	80	10	10
Analyse and synthesise What does it mean? What can we make?	20–80	20–40	20
Collaborate and communicate How do we relate?	20	40	40

emulate. This evaluation also frees up resources if the student who can innovate can act as a peer model.

5.3.2 Possibilities for BELZ Use

Informed by BELZ as a conceptual framework, data collection tools may include

- Pre- and post-questionnaires, each informed by the six BELZ facets, which explore participants' self-assessment of their cognitive skills in the context of BL. This provides data that shows statistically significant changes over time and student attribution to the causes of those changes. This strategy was part of the triangulated data collected in a study across five universities in numerous disciplines (Willison, 2012) and in engineering (Missingham, Shah, Sabir, & Willison, 2018).

- Analysis of artefacts of student work produced by school students and ITE students at university. This analysis using BELZ has been conducted within schooling (Willison, Bennet, Daughtry, & Suh, 2019).
- Individual and focus group interviews eliciting views about the effectiveness of learning in the BL environment.
- Structured lesson observations (Willison, Conlon, Gianni, & Pierce, 2018).
- Analysis of artefacts of work produced by schoolchildren in classes taught by a treatment group and a control group (Willison et al., 2019). Moreover, student artefacts produced by direct engagement with BELZ (see Fig. 5.1) may be analysed.
- Interviews with those who completed a programme of study and analysed using BELZ to identify cognitive and affective outcomes for graduates (e.g. Ain, Sabir, & Willison, 2019; Wilmore & Willison, 2016).

5.4 Conclusion

This paper aimed to show that while BL has become the norm across formal education, most evaluation frameworks that exist focus, in effect, on blended teaching. The Blended and Engaged Learning Zones—BELZ—was introduced as a framework for the evaluation of BL that prioritised student learning processes and outcomes rather than teacher and technology inputs. BELZ satisfied the eight characteristics of an effective BL evaluation framework presented in this paper and thus is a candidate for use across education to inform BL. BELZ was detailed in terms of its six facets of sophisticated thinking elaborated along zones of student autonomy, in which students emulate, improvise, and initiate. An example of the use of BELZ, focusing on cohort preparedness for subsequent inquiry learning, provided a provocative evaluation of the BL curriculum and environment that students had experienced up until that point, to provoke student-oriented changes to the curriculum. Just as important, the evaluation of the cohort was also suggestive of changes to the curriculum that awaited them, so that 'evaluation' with BELZ looks back to improve and looks forward to anticipate.

Research on the effectiveness of BELZ is required, including rich, fine-grained studies of curriculum improvement informed by BELZ and quantified studies that look broadly, especially across multiple BELZ uses, to guide improvement over the timeframes of multiple terms/semesters and years. For the ITE context, a substantial benefit of BELZ is that it has a pedigree and design for school as well as university education. Therefore, if BELZ is used in ITE courses for evaluation, students can be informed about BELZ, both for their own evaluation of school classes when they are observing or teaching, as well as a pedagogical model to inform their teaching to enhance the learning of their students.

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Chapter 6
New Understandings of Instructional Theory: Finding the Instructional 'Sweet Spot'

Brendan Bentley

Abstract This chapter examines the contemporary understanding of instruction verified by the accumulation of generations of scientific work and looks at finding the instructional 'Sweet Spot' where teachers can design instruction that is fun, efficient, and rigorous. Two instructional models are interrogated, the Constructivist Learning Theory and the Cognitive Load Theory, by reviewing empirically based literature and exploring the key ideas that surround the salient variables implicated in instruction. The chapter challenges the misconceptions and benefits associated with each of the two models and an argument is put forward, based on empirical research, highlighting that instructional models that produce substantial learning effects occur when the instruction is clear, short, unelaborated, does not overload the mind, and learners are provided with a supply of worked examples. Specific empirical evidence is unpacked that asserts that students who are exposed to teachers who employ directive teaching methods increase their achievement scores, which challenges the current paradigm of some educational practices. While evidence suggests that direct instruction has many benefits, the chapter explores that, at times, non-direct instruction may have some place in teaching and that the instructional 'Sweet Spot' may be a blend of both direct and non-direct instruction. The chapter concludes by providing strategies, based on evidentiary research, for creating instructional tasks designed using cognitive load principles and non-direct instruction techniques to help educators find the elusive instructional 'Sweet Spot'.

Keywords Cognitive load theory · Constructivism · Direct instruction · Teacher education · Higher education · Theory of education

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6.1 Introduction

The most recent Programme for International Student Assessment (PISA) results (OECD, 2019a), released in December 2019, paint a picture of a continued decay in Australia's global educational rankings. The 2018 PISA results revealed that 15 year olds in Australia, when compared to their international counterparts, have fallen dramatically across the subject areas of mathematics, science, and reading (OECD, 2019a). The average scores for Australian students in these subject areas were at record lows and much of the blame for this demise has been placed on Initial Teacher Education (ITE) with one commentator stating that 'Teaching education in Australia is atrocious' (Kelly, 2019). Supporters of this discourse argue that the falling results are attributed to the decline in university entry Standards for teaching programmes, a lack of career pathways for in-service teachers, and a shift in instructional practices (Visontay, 2019). These claims are set within an already turbulent sea of continuous educational change that has washed up on Australia's educational shores.

This chapter explores the background driving this sea of change that has provoked recent Australian ITE reform. It provides a response to the confusion associated with the shift in instructional practices and, in particular, those practices that inform ITE curriculums and ultimately impact on pre-service and early graduate teachers as they enter the teaching workforce. Central to this exploration is investigating the contentious issue of whether certain instructional practices should be adopted in preference to others. Two theoretical frameworks are examined; Constructivist Learning Theory (Narayan et al., 2013; Yilmaz, 2008) and Cognitive Load Theory (Sweller, 1988; Sweller, Ayers, & Kalyuga, 2011), both grounded, respectively, in non-direct and direct instructions are critiqued against recent evidence-based research, which has been verified by a corpus of literature. An argument is put forward that rather than non-direct and direct instruction be considered as oppositional to each other, if carefully implemented, each may complement the other to create a more efficient and effective method of learning. It is in the critical composition and application of these two instructional practices that the instructional 'Sweet Spot' may be found.

6.2 Educational Reform—A Brief Overview

The search for the instructional 'Sweet Spot' is situated in a milieu of relentless educational change. In recent years, many new teaching practices (i.e. the mandatory re-introduction of phonics to some ITE programs) have been aligned to new government and strategic policies. ITE programs and the teaching profession have grappled with the adoption of these changes, in part, due to the volume and scale of what has been requested. The enormity of what is being asked is reflected in the high level of scrutiny teacher education has endured. From the 1970s to 2014, more than 100 reviews were undertaken that appraised teacher education in Australia (Mayer, 2014).

Three influential national education agreements have at various times informed this discourse of review and change, acting as both a blueprint and catalyst for educational reform. The Hobart Declaration on Schooling (1989), the Adelaide Declaration on National Goals for Schooling in the Twenty-First Century (1999), and the Melbourne Declaration on Educational Goals for Young Australians (2008) have provided a road map for the orchestration of change. More recently in December 2019 a fourth declaration, the Alice Springs (Mparntwe) Education Declaration (2019), has been issued and will provide further impetus and direction for educational reform.

The agreement by all of Australian Educators Ministers at Adelaide Declaration saw a set of national goals and born from that and the other declarations has been the creation of three new and prominent educational bodies: the Australian Curriculum, Assessment and Reporting Authority (ACARA) created in 2008, the Australian Institute for Teaching and School Leadership (AITSL) created in 2010, and the Teacher Education Ministerial Advisory Group (TEMAG) created in 2014.

The ACARA was founded as an independent statutory body. It has implemented a regime of initiatives, primarily through the development of the National Assessment Program (NAP) and for the first time in Australia's history a national curriculum. The AITSL was created to promote excellence throughout the teaching profession, from PST to principal, across all educational settings. The TEMAG was established as an advisory body to supply guidance to the Australian Federal Government on issues related to ITE. The Advisory Group's reform goals included the strengthening of ITE course accreditation, improving the selection of candidates for entry into ITE programs, improving the professional experience for Pre-Service Teachers (PSTs) when in schools, providing a robust assessment at PST graduation, improving the research surrounding ITE course effectiveness, and providing higher-quality workforce data. Each of these three bodies was created to perform and function independently but each complements the other to improve the quality of education and teaching across Australia. They have played a central role impacting recent Australian ITE reform and have heavily influenced the discourse on *how to teach.*

6.3 The Recent Impact of Reform on Initial Teacher Education (ITE) in Australia

The impact of the TEMAG reforms upon ITEs has had far-reaching implications. The centrepiece of change has been the introduction of what is known as the Teacher Performance Assessment (TPA). This assessment has been implemented as an assurance that PSTs at graduation will be classroom-ready. This assessment is undertaken during the final year of their ITE program.

To complement the TPA requirement, a series of teaching Standards known as the Australian Professional Standards for Teachers (APST) has been implemented establishing a clear Standard of achievement that graduate teachers must meet in

order to successfully graduate from their teaching degree, representing a new era of benchmarking graduate and teacher quality.

The carriage for designing the teaching Standards has been undertaken by AITSL. The APST is composed of a framework that outlines the level of desired expertise required as a teacher moves from a graduate to proficient to highly accomplished and then to a lead teacher. Each career stage is sequenced and increases in sophistication from the early career stage beginning at a graduate-level teacher. Each career stage is then set into seven Standards. These are divided into the following three domains: Professional Knowledge, Professional Practice, and Professional Engagement. The Standards provide a concise overview of the expectations at each stage of a teacher's career. Each Standard is then divided into focus areas and descriptors. The descriptors identify the various components considered to be quality teaching compared to each stage of a teacher's career.

In a broader sense, the APST articulates a setting of explicit Standards and skills a teacher should know and be able to execute. The APST collectively provides a framework to better understand what it means, in general, to know *how to teach*. The document is 'interconnected, interdependent and overlapping' (AITSL, 2019, p. 7). At the graduate level, the seven Standards together embrace many of the elements that are considered important to becoming a classroom-ready practitioner. While each of the Standards as a whole paints a rich picture of classroom readiness, each Standard when viewed individually provides a clear focus of an aspect of this readiness.

Standard 1, more than any other Standard, reinforces the focus on instructional practices. It is found under the graduate domain of Professional Knowledge, is situated Focus Area 1.2: Understand how students learn. The Focus Area 1.2 descriptor states that graduate teachers should be able to 'Demonstrate knowledge and understanding of research into how students learn and the implications for teaching' (AITSL, 2019). While the other Standards and focus areas are congruent with each other, meeting Standard 1 at a graduate level is pivotal in ensuring PSTs at graduation know *how to teach.* Understanding the philosophies and theories underpinning how students learn both drives and shapes the instructional practices chosen by educators and taught by ITEs.

In particular, two of these different instructional practices, non-direct and direct instruction, have long been entrenched in the daily professional practices of teachers around the world and both remain contentious. Non-direct (problem or inquiry based) learning has in the past 40 years gained a foothold in contemporary instructional practice. In particular, non-direct instruction has been promoted by governments as well as other leading world bodies as a preferred model of instruction. The Australian Curriculum supports the use of problem-based approaches as does the Organisation for Economic Cooperation and Development where it actively promotes project or inquiry-based learning as an approach to *how to teach* (Barrows & Tamblyn, 1980; Barron & Darling-Hammond, 2010; OECD, 2019b). This is at odds with other findings that favour approaches that support explicit or direct instruction. This position is informed by other empirical researchers and commentators (Kirshner, Sweller, & Clark, 2006; Rosenshire, 2009) who suggest that additional benefits to learning may

exist through using approaches that are sympathetic to direct instruction (Klahr & Nigam, 2004; Rupley, Blair, & Nichols, 2009).

While it is generally accepted that the main purpose of ITE programs is to ensure PSTs learn *how to teach*, the introduction of the Standards has encouraged a discourse debating the type of instructional practices that should be adopted by the broader educational community. This has understandably caused confusion and consternation amongst educators and the wider population and has raised the further contention of whether there is indeed a preferred instructional model of practice. The contested nature of this discussion has placed Australian ITE providers under increasing pressure and has required them to meet many new compliancy obligations.

6.4 Non-direct Instruction—Constructivist Learning Theory

Constructivist Learning Theory has been the dominant learning theory that has been adopted for the past 40 years by educators in Australia and across the world. Since its emergence, many ITEs have adopted constructivist approaches as a preferred instructional practice within their ITE programs (Aldridge & Bobis, 2003). Such is its popularity; it also 'underpins major recommendations from teaching in curriculum documents from around the world (see Australian Education Council, 1991; National Teachers Council of Teachers of Mathematics, 2000)' (Bobis, Mulligan, & Lowrie, 2009, p. 7). This claim is affirmed by Moreno and Park (2010) where they state 'constructivists' theories have been very influential in guiding educational practices and curriculum, and have become the basis for the standards of teaching developed by national education groups' (p. 21).

Since its inception, constructivism has presented itself in a panoply of theoretical positions (Ernest, 1991). As suggested by Powell and Kalina (2009, p. 241) 'Constructivism is a vague concept', which does not have a single definitive meaning. In general parlance, constructivism is an active process, where novel information is constructed by the learner (Merriam, Caffarella, & Baumgartner, 2007; Noddings, 1990), and the learner is likely to develop their 'own model of the information' (Vogel-Walcutt, Gebrim, Bowers, Carper, & Nicholson, 2010, p. 135). As Cobb, Wood, and Yackel (1990) purport, a fundamental principle of constructivism is that learning is an active experience and learners are 'active organisers of their experiences' (p. 126). Within Constructivist Learning Theory, two preeminent versions of the theory have appeared and prevailed in contemporary education, cognitive constructivism, and social constructivism (Churchill et al., 2019).

6.4.1 Cognitive and Social Constructivism

Cognitive constructivism is founded upon the work of Swiss psychologist Piaget (1963). His theories are based on the premise that learning is an individualised and continuous process and suggests knowledge is not passively acquired but actively constructed. Piaget theorised that learners *assimilated* and *accommodated* new knowledge, dependent upon their level of cognitive capacity. He postulated that learners pass through cognitive stages and constructed knowledge according to their past experience and cognitive development (Bobis et al., 2009).

Cognitive constructivism considers learning as a process that involves moving through various developmental stages. Knowledge is actively constructed when new knowledge is assimilated within the existing schema. However, when new information contradicts the existing schema, difficulty arises in the learner 'absorbing' this new information and is considered a state known as 'cognitive conflict'.

The notion that a learner constructs their own meaning from their lived experience is also a principle of social constructivism. The striking difference between cognitive constructivism and social constructivism is that learning occurs through social interactions and experiences. As Kivunja (2015, p. 14) suggests, 'learning is a social experience rather than an individual one'. Through social interactions and shared conversations, social constructivists believe that the learner will actively construct their knowledge influenced by the interactions they have with others. Much of social Constructivist Learning Theory originates from the work of Russian cognitive psychologist (Vygotsky, 1978). He argued that social interactions have an important role in the learning process. Vygotsky's social constructivist ideas made clear that greater learning success occurred if the learner engaged with others who were more skilled and knowledgeable than themselves and who were members of their immediate society and cultural setting.

Vygotsky further theorised that during the learning experience significant criteria needed to be satisfied by the learner if a successful learning experience was to be achieved. Central to these criteria was recognising that a child's learning was determined by the concepts, skills, and schemas they had already developed. The range of learning activities and experiences where successful learning can occur directly relate to their past learning or prior knowledge. Vygotsky referred to this concept as the learner's Zone of Proximal Development (ZPD).

While theorists such as Piaget, Bruner, and Dienes (Reys, Lindquist, & Lamdin, 2007, p. 26) support the idea that learning has a social dimension, Noddings (1990) argues that 'In order to teach well, we need to know what our students are thinking' (p. 15). It is here in the social educational context that the learner can discuss their ideas with others and generate their own solutions (Reys et al., 2007). It is also in the social setting that Bruner identified the importance of play and discovery in the learning process. 'The very attitude and activities that characterise "figuring out" or "discovering" things for oneself also seem to have the effect of making material more readily accessible in memory' (Reys et al., 2007, p. 32). The idea of learning through discovery is often associated with constructivist learning and has manifested

itself in teaching practices such as guided discovery and problem solving (Anthony, 1973; Goldin, 1990). Even though some argue the benefits of non-direct instruction, the critical question arises whether Constructivist Learning Theory should remain the preferred instructional practice when we have seen such little improvement and, in some cases, a decline in Australian national and international academic results as evidenced by recent NAP testing and the 2018 PISA data.

6.5 Direct Instruction—Cognitive Load Theory

The alternative to non-direct instruction is direct instruction. Direct instruction is generally considered as 'providing information that fully explains the concepts and procedures that students are required to learn' (Kirschner et al., 2006, p. 75). Advocates of direct instruction suggest that a novice learner benefits from highly guided instruction (Klahr & Nigam, 2004; Mayer, 2004). Direct instruction provides a means for information to be presented clearly and taught explicitly enabling the learner to acquire specific information in an efficient manner. However, and this is the catch, when novice learners engage in novel information, they do so with little prior knowledge or existing schema; while they may benefit from the attributes associated with direct instruction, there remains some short comings for the learner. They are often overburdened with too much of new information. They have difficulty in retaining this new information, and their working memory has difficulty in making sense of what has been presented to them. They have trouble in problem solving; they are in fact suffering from cognitive load. The finite and limited resources of the working memory have been depleted.

Cognitive Load Theory apprises the design of instructional tasks and attempts to minimise the cognitive load experienced by the learner during direct instructional activities that, in turn, maximises the available resources of the working memory. Researchers contend that the working memory has a limited capacity, dealing with a maximum of seven ± two items at any one time (Miller, 1956). Others have contested this and suggested that the number may be three to five items (Cowan, 2010); however, what is important is that those limitations on the vital resources of the working memory influence learning and learning tasks. Further research has suggested that the working memory is attributed to executive functioning and is responsible for cognitive activities such as problem solving (Baddeley, 2000) and the transfer of information from the working memory to the long-term memory (Tulving & Craik, 2000). It is for this reason that Cognitive Load Theory situates itself closely within the instructional practices of direct instruction and where novice learners have proven to have received the most benefit.

Three types of cognitive load exist (Moreno & Park, 2010; Sweller et al., 2011). Two types of cognitive load can be imposed on a learner, intrinsic and extraneous load. Intrinsic load is dependent upon the inherent difficulty of the task and a learner's prior knowledge (Martin & Evans, 2019; Wong, Castro-Alonso, Ayres, & Paas, 2019) with

learning ideally occurring within their ZPD (Leppink, Paas, van Gog, & van Merriënboer, 2019; Vygotsky, 1978). Intrinsic load is also dependent upon the number of different elements within the learning task and how these elements interact with each other; the more elements and element interactivity within the task suggests a greater level of difficulty and increased level of intrinsic cognitive load. The extraneous load is alterable and is generated when instructional material is poorly designed and contains extraneous information. The extraneous load can be reduced by altering the task design by removing unnecessary material.

The third form of cognitive load, germane load, is recognised as a form of load created when schemas are constructed (Mayer, 2002) and the automation of information when processing specific tasks (Ayres, 2006). It is a load that occurs through the process of cognition and occurs when the learner is interpreting, differentiating, or organising information.

6.6 The Myth

On face value, it is easy to misconceive the benefits of non-direct instructional practices and accept Constructivist Learning Theory as the premier instructional learning theory, one that should be adopted and adhered to by Australian education. It is based on rigorous and proven theories of human physical, emotional, and cognitive development. Some aspects of Constructivist Learning Theory sit congruently and comfortably within the framework of direct instruction; learning tasks should be designed to take place within the learners' ZPD; learning should be fun, and most of us know that learning is sometimes more enjoyable in a social setting. The advocates for discovery learning continue to assert 'each time one prematurely teaches a child something he could have discovered for himself, that child is kept from inventing it and consequently from understanding it completely' (Piaget, 1970, p. 715).

However, little evidence exists to support the assertion that Constructivist Learning Theory is more beneficial compared to other instructional models such as direct instruction. There has been much written and documented about the Constructivist Learning Theory, but there is little empirical evidence of its successful application (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011; Tobias & Duffy, 2009). Researchers such as Klahr and Nigam (2004) suggest that direct instruction was clearly superior to discovery learning from their research findings. Other researchers, such as Mayer (2004), assert even more strongly as to why discovery and other inquiry-based learning remains credible. Mayer stated, 'anyone who takes an evidence-based approach to educational practice must ask the same question: Where is the evidence that it works? In spite of calls for free discovery in every decade, the supporting evidence is hard to find' (p. 17).

What is not considered by proponents of constructivism is the finite capacity of the working memory (Sweller, 1988). Instructional theories that do not consider the limitations of the working memory when dealing with new or novel information, as suggested by Kirschner et al. (2006), are likely to be ineffective. The general premise

of constructivist learning strategies is to offer novice learners with problems to solve with minimum guidance, which often leads to learners engaging with information that exceeds their working memory capacity. As suggested by Kirschner et al. (2006), 'Inquiry-based instruction requires the learner to search a problem space for problem-relevant information. All problem-based searching makes heavy demands on working memory' (p. 77). The heavy reliance on non-direct instructional tasks that draw heavily on the resources of the working memory does not benefit the acquisition of schema, and it is for this reason that direct learning practices that embrace tasks designed using principles of Cognitive Load Theory should be sought as an alternative to non-direct Constructivist based instructional practices.

6.7 What Is the Instructional 'Sweet Spot'?

The instructional 'Sweet Spot' is the point of a learning task where the working memory is operating at its optimal potential, problem solving, drawing on previous schema from the long-term memory, acquiring new schema, and performing all of its intended executive functions. To achieve this, an educator must know the amount of novel information that is able to be presented at any one time. The working memory's finite resources limit the amount of new content that can be taught in any one learning session. Once the working memory's resources are used, learning becomes more difficult, problem solving and executive functioning capacity all diminishes, and the efficiency of transferring novel knowledge to the long-term memory declines. The 'Sweet Spot' of learning, the moments when schema is most efficiently acquired and integrated into the learner's long-term memory, is lost. The point where there is adequate resourcing for the working memory to freely problem solve without hindrance, where the new information can be transferred to the long-term memory, is the 'Xanadu' educators should aspire to situate their lessons.

To understand the magic of the working memory and find the elusive 'Sweet Spot', it is important to know that while the working memory can only deal with maximum of seven ± two items at any one time when necessary it can draw on a large number of items by chunking these items together as one unit. These items or schemas can differ in their complexity and size and are the building blocks for the construction and storage of knowledge (Kalyuga, 2010; Sweller et al., 2011). Multiple items or schemas can be activated within the working memory all at once by being chunked together as a single unit of information. A collection of studies using novice and expert chess players that were performed in the 1950s–1970s (Chase & Simon, 1973; Chi, Feltovich, & Glaser, 1981; DeGroot, 1965) supported the notion that the limitations to the working memory in part could be overcome by chunking. The combining of information into one chunk enables the working memory to deal with a large amount of information that can still accept more information before any deficiency in processing occurs.

Once schemas are constructed and automated in the long-term memory, they can be drawn on by the learner when they are required. Because automated schema poses little burden and uses little or no working memory resources, the available

capacity within the working memory is maximised to integrate new information, solve problem, and transfer the novel information to the long-term memory. As suggested by Sweller (1999), the long-term memory is a wonderful source that allows us to perceive, think, and solve problems.

The ability of the working memory to perform the miraculous task of chunking numerous bits of information into one unit enables educators to design tasks that reduce cognitive load while providing the working memory with the maximum amount of available resources.

6.8 Choosing the Right Instructional Practice?

While the recent body of literature has questioned whether Constructivist Learning Theory should remain the accepted and dominant paradigm used within education to underpin educational theory and practice (Bentley & Sieben, 2019; Bentley & Yates, 2017; Kalyuga, 2010; Martin & Evans, 2019; Renkl & Atkinson, 2010), there are times when non-direct instruction has a superior role to play than direct instruction. While the execution of constructivist approaches to learning has not achieved the desired national or international educational outcomes, it does not mean that Constructivist Learning Theory should be abandoned. The true craft of teaching and the trick to finding the instructional 'Sweet Spot' is choosing when to and when not to use either instructional practice.

Critical in deciding whether educators should consider Constructivist Learning Theory, Cognitive Load Theory, or a combination of both approaches is determining the purpose of the lesson and who the lesson is aimed at. Is the lesson an introductory lesson? Is the learner a novice with little schema? Is the learner an expert with existing complex schema? Is there specific information that is required now before a future lesson in the overall lesson sequence is given? All these questions are relevant and important for deciding which approach should be adopted.

Given the complexity of decision making in choosing the most appropriate instructional practice, much of what is presented in classrooms is novel information taught to novice learners. To find that instructional 'Sweet Spot', educators must strive to ensure that the overloading of the working memory is minimised to prevent the inhibition of learning. An important consequence, therefore, is for educators to consider how in their everyday practice do they adopt instructional techniques that are specifically designed to reduce the demands on the working memory to optimise learning.

A key aspect of reducing the cognitive load and maintaining the instructional 'Sweet Spot' during a learning task is the teacher's awareness of a learner's prior knowledge. Acknowledging a learner's prior knowledge enables an educator to develop instructional methods that efficiently use the learner's 'limited cognitive processing capacity to stimulate their ability to apply acquired knowledge and skills to new situations' (Paas, Tuovinen, Tabbers, & Van Gerven, 2003, p. 63).

Using both formative and summative forms of assessment to inform the design of instructional tasks has long been recognised by educators as best practice (Brady & Kennedy, 2012). Using various forms of assessment ensures that educators can discern what tasks are appropriate and within a learner's ZPD, thus optimising the learner's opportunity to acquire new knowledge and schema. It provides educators with insights for designing instructional learning tasks to support the construction and automation of schemas (Sweller, van Merriënboer, & Paas, 1998). Using both formative and summative assessments empowers educators to design tasks to meet the learner's specific needs and, where necessary, redesign a learning task to meet the learner's stage of cognitive development.

An awareness of a learner's prior knowledge provides the prospect of determining the learner's state in relation to their level of novice or expertise status. As suggested by Kalyuga (2010), 'Novice learners possess only very limited lower-level knowledge associated with surface aspects of a domain, while experts are capable of activating high-level schematic structures that contain critical information critical to problem solutions' (p. 50). This information informs an educator where a learner is situated in relation to the sequence of learning. It offers an educator, if necessary, the opportunity to design highly guided instructional tasks for novice learning. It enables educators to provide novelty or complex tasks that may engage in independent instructional approaches such as project or inquiry-based learning tasks.

Recent research has highlighted the importance of using highly structured, guided, and direct instruction as the initial form of learning engagement. The positive effects of using worked examples have been affirmed in many studies (Atkinson, Derry, Renkl, & Wortham, 2000; Renkl, 2005; van Gog, Kester, & Paas, 2011) and supports the idea of highly structured guided instruction. The literature in this field has been conclusive in its findings, consistently identifying the positive impacts worked examples have on simple acquisition tasks.

The use of a worked example early in a sequence of lessons supports the assertion that learning will be negatively impacted if novices start learning with problem solving (Kalyuga & Hsu, 2019). Kalyuga and Hsu further found that students who received a worked example as their first form of instruction outperformed those who received problem solving as their first form of instruction. This result is supported by other studies (Alfieri et al., 2011; Bentley & Yates, 2017) where no significant benefit was derived from discovery learning approaches when compared to worked examples.

It is therefore evident that educators should be encouraged to use worked examples in lieu of constructivist's approaches during the early phases of learning new and novel information. While the early phase of learning using a worked example as a first approach often requires learners to gain basic domain knowledge, they undertake this task with little application of this new knowledge. Although some may be critical of this lack of knowledge application, until the new information is automated, the effects of the problem-solving capacity on the working memory are severely hindered. Educators should be encouraging learners to automate information prior to them applying it in problem-solving scenarios. Learners who lack domain-specific knowledge and understanding employ shallow or general search strategies to attempt to

solve problems (Renkl & Atkinson, 2010). They are confronted with information they are unfamiliar with and induce increased levels of extraneous load impairing their ability to acquire schema. Therefore, educators should use constructivists approaches such as problem-based learning once the learner has domain-specific knowledge that they can easily draw on, which is in their long-term memory and is automated. They can draw on this schema with minimal interference to the capacity of the working memory, enhancing the learning experience by making available the resources of the working memory to acquire new schema and solve problems.

6.9 Conclusion

This chapter has examined two contemporary instructional theories in search of the instructional 'Sweet Spot'. It has provided insight using scientifically based research to support graduate teachers to know *how to teach* as they move into their professional lives. The chapter has identified aspects of the enormous corpus of research that has been constructed over recent years to review and provide a deep and robust theoretical insight into human learning and cognition.

The chapter has debunked some of the theoretical assumptions regarding instructional practices by reviewing the empirical findings and practices of both Constructivist Learning Theory and Cognitive Load Theory. This has provided clarity for educators to consider how they can choose to implement the elements of pedagogy, cognition, and memory in their everyday professional practice, where the theory can inform and drive evidence-based practices.

A central assertion of the chapter establishes the benefits of integrating or concurrently using both Constructivist Learning Theory (non-direct instruction) and Cognitive Load Theory (direct instruction), as instructional approaches under certain conditions. These conditions are dependent, in part, upon the teaching intent or purpose, the learner's prior knowledge, and where in the learning sequence the instructional theory is applied. Primarily, it requires tasks to be designed to optimise the potential of the working memory by making available the maximum amount of working memory resources.

Although resolving Australia's decline in national and international educational result cannot be resolved overnight, the interrogation of the benefits of both instructional approaches may provide a way forward for longer-term improvement. ITE programs can only lay the foundations for the broad range of skills, knowledge, and expertise required by a graduate teacher to know *how to teach.* The craft of teaching is cultivated over time. The short years that PSTs are enrolled in their ITE programs are only a stepping stone and complement what they learn as they move forward in their teaching career. By providing PSTs with a rich understanding of instructional theory, upon graduation they will be informed to make explicit decisions to choose the elements of high-quality effective teaching that will improve educational outcomes for students.

While critics of Constructivist Learning Theory argue that other forms of instruction may be beneficial, it is important to highlight that when constructivism first emerged in the 1960s, human cognitive architecture and Cognitive Load Theory did not exist. Consideration of a new paradigm to instructional theory should be given considering the most recent research in the field. A synthesis of the current research in cognitive and learning theory suggests that both Constructivist Learning Theory and Cognitive Load Theory could be combined to create a new instructional model, possibly called '*Constructivists Learning Theory*'. As Wiliam (2017) suggested, Cognitive Load Theory 'is the single most important thing for teachers to know'; we may find that, by combining Cognitive Load Theory with constructivism, we generate the necessary impetus to see our international educational rankings rise.

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Chapter 7
Quality and Equity of Student Performance in Mathematics in Indonesia, Malaysia, Singapore, Thailand and Vietnam

I. Gusti Ngurah Darmawan

Abstract Education has long been acknowledged as one of the key factors in enhancing both social and economic wellbeing and is receiving increasing amounts of attention and priority in many countries worldwide, particularly those in the Southeast Asian region. Nearly every country in this region has invested extensively in education since the 1990s. However, not all countries have managed to improve the practice and effectiveness of their education systems over the past two decades. Students in Singapore have consistently shown superior academic performance in various international assessment programmes, including the PISA of the OECD. Students in Indonesia, on the other hand, received the lowest average mathematics scores in PISA 2015. This study focused on assessing the quality and equity of mathematics performance with respect to 15-year-old students in PISA 2015 from five participating Southeast Asian countries, namely Indonesia, Malaysia, Singapore, Thailand and Vietnam. In addition, this study addressed the complex issues involved in making comparisons in mathematics performance of the 15-year-old students among these different countries.

Keywords Assessment · Mathematics performance · Programme for international student assessment (PISA) · Quality and equity · Secondary education · Southeast Asian countries

7.1 Introduction

It can be argued that education is a major component of human development. While both national economic development and life expectancy are components of the Human Development Index, education is another key component of the index (United Nations Development Programme, 2018). A quality education system contributes to an increasing rate of economic growth (Hanushek & Woessmann, 2008) and human capital improvement (Glewwe, Hanushek, Humpage, & Ravina, 2011). Furthermore,

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while the conservation of natural resources is also essential for human survival, knowledge gained from scientific inquiry as well as the understanding and application of such knowledge demand that nearly all people worldwide have mastered literacy and numeracy skills. It is the task of education not only to undertake the passing on of the cultural traditions of each country from one generation to the next but also to ensure that all people worldwide contribute to what has become known by UNESCO as 'globalisation' and 'sustainable development' (De Leo, 2012) and to participate in the 'Education for All' programme that was commenced in 1990. The success of an education system depends on the combination of quality and equity in education outcomes (OECD, 2013).

Through the growth in the world's population over the past two centuries has been remarkable, it also contributes to many of today's environmental and social issues. At the beginning of the nineteenth century, approximately one billion people were living on Earth. At the onset of the Great Depression in 1930, there were approximately two billion people alive. At the time of writing in 2019, the world population is 7.7 billion. This is projected to increase by 1 billion over the next 10 years and reach 9.7 billion by 2050. In the light of this exponential population growth across the globe, it is more important than ever to lift the quality and equity of education to overcome these global issues.

As neighbouring regions of Australia, the Southeast Asian region is of interest for the present study. Five Southeast Asian countries (Indonesia, Malaysia, Singapore, Thailand and Vietnam) were the only countries in the region to be involved in the Programme for International Student Assessment (PISA) 2015 by the OECD and were therefore selected for further investigation in this study. In 2019, these five countries are home to approximately half a billion people or approximately 6.5% of the world's population.

Table 7.1 records, in millions, the estimated populations of the five Southeast Asian countries over the 150 years from 1950 to 2100 with high and low projections for the years above 2000, together with a medium value and a constant fertility

Table 7.1 Populations of the five countries in millions

Year	Fertility rate			
	Constant	High	Medium	Low
1950	122.2	122.2	122.2	122.2
1975	236.1	236.1	236.1	236.1
2000	381.6	381.6	381.6	381.6
2025	500.4	503.4	498.9	494.5
2050	576.7	603.9	553.4	504.6
2075	615.4	678.1	544.9	432.8
2100	651.8	757.6	510.1	328.9

Source United Nations Department of Economic and Social Affair Population Division (2019)

variant. Thus, over a period of 150 years, there is likely to be approximately a five-fold increase in the population of the five countries, assuming that the fertility rate remains constant.

7.2 Roles of Education and Monitoring Quality and Equity in Education

It falls to education and the use of the educative process, rather than economic and political operations, to transform the thinking of large bodies of people to work together to provide the changes necessary to overcome the major challenges that confront the human race during the twenty-first century and beyond. The marked expansion of the world's population since the beginning of the nineteenth century, and that is expected to continue during the twenty-first century, led to the establishment of the United Nations Organisation (UN) and its affiliated organisations, particularly UNESCO (UNESCO, 2015). These developments are referred to as part of the 'globalisation movement' that is necessary for maintaining peace between nations as well as maintaining 'sustainable development' across the planet (Zajda, 2010).

There are, moreover, two areas where monitoring is occurring on a worldwide basis that are directly related to the field of education. These guide the programmes and operations of UNESCO and are related to the globalisation movement, which has emerged in recent decades. These two areas are (a) monitoring of the wellbeing of the human race with the Human Development Index (HDI) and the Gender Inequality Index (GII); and (b) monitoring of educational achievement, particularly with respect to the skills of literacy and numeracy and the learning of mathematics and the sciences that are assessed by the PISA programme.

7.2.1 Human Development and Wellbeing

Data reporting on human development in the five studied countries were obtained from the United Nations Development Programme Human Development Reports. The HDI values are recorded in Table 7.2 for the five selected countries, the world and the four identified groupings with respect to the HDI level (United Nations Development Programme, 2018).

Table 7.2 depicts that Singapore has a very high HDI value that is greater than 0.89 and a life expectancy level of more than 80 years, together with high levels of education and GNI per capita. Malaysia just reaches the boundary of a very high HDI value, while Thailand has a high HDI value. The values for these three countries can be contrasted with the values recorded for Indonesia and Vietnam that are still in the medium human development (HD) group of countries. Worldwide, life expectancy

Table 7.2 HDI for 2018

Country or region	HDI	Life expectancy at birth	Expected years of schooling	Mean years of schooling	[a]GNI per capita	[b]HDI rank
Singapore	0.932	83.2	16.2	11.5	82,503	8
Malaysia	0.802	75.5	13.7	10.2	26,107	57
Thailand	0.755	75.5	14.7	7.6	15,516	86
Indonesia	0.694	69.4	12.8	8	10,846	115
Vietnam	0.694	76.5	12.7	8.2	5,859	116
Very high HD[c]	0.894	79.5	16.4	12.2	40,041	
High HD	0.757	76	14.1	8.2	14,999	
Medium HD[c]	0.645	69.1	12	6.7	6,849	
Low HD[c]	0.504	60.8	9.4	4.7	2,521	
World	0.728	72.2	12.7	8.4	15,295	

Source United Nations Development Programme (2018, pp. 22–25). *Notes* [a]Gross National Income (GNI) per capita PPP US$ for 2011; [b]for 189 countries; [c]Human Development (HD)

is 72.2 years and the average GNI per capita is above US$15,000 (Table 7.2). The trend in the HDI values of the five countries since 1990 can be seen in Fig. 7.1.

Although Singapore, Malaysia, Thailand, Indonesia and Vietnam are neighbouring countries, they have different characteristics that could contribute to their differences in student performance in mathematics. Information on seven selected national indicators is shown in Table 7.3. The area can be used as an indication of the demographic spread, the population-related indicators are representative of the size and composition of the education system, and the economic indicators can imply

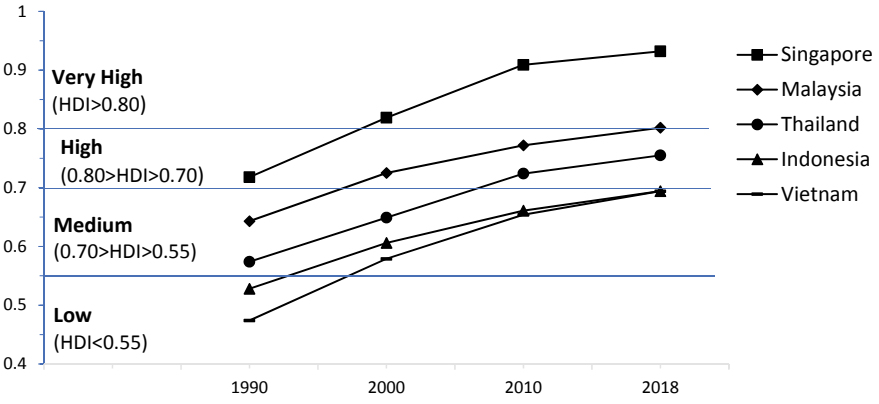

Fig. 7.1 HDI trends

Table 7.3 Selected indicators

	[a]Area (square km)	[b]Population (thousands)	[b]Population Density	[c]Urban (% of total)	[c]Gender Inequality Index	[d]GDP per capita	[e]Education Expenses (% of GDP)
Singapore	710	5,804	8137.9	100.0	0.067	80,192	2.9
Malaysia	329,847	31,950	93.6	74.7	0.287	25,308	4.7
Thailand	513,120	69,626	133.4	50.4	0.393	15,345	4.1
Indonesia	1,904,589	270,626	143.8	53.7	0.453	10,385	3.6
Vietnam	331,210	96,462	304.6	33.6	0.304	5,668	5.7

Sources (1) United Nations Development Programme (2018); (2) United Nations Department of Economic and Social Affair Population Division (2019). *Notes* [a]for 2019; [b]for 2019; [c]for 2019; [d]Gross Domestic Product (GDP) per capita PPP US$ for 2011; [e]for 2018

the financial capacity of the countries to provide educational resources. In terms of land area and population size, Indonesia is the largest and Singapore is the smallest. However, in terms of population density, Singapore is now the highest, with 100% of its population living in urban areas. Malaysia's land area is similar to that of Vietnam, but nearly 500 times larger than that of Singapore, 3/5th the size of Thailand and 1/6th that of Indonesia.

7.2.2 International Monitoring of Educational Achievement

Since 1990, under the guidance of UNESCO and the other UN agencies, an estimated 70% of the nations declared a global policy of 'Education for All' and a movement towards monitoring achievement in education (UNESCO, 2009; United Nations, 2010). There has been a drive towards the monitoring of achievement outcomes in education, both nationally and cross-nationally. Kamens and McNeely (2009, p. 20), working from Stanford University in the United States, contended that the operation of three principal features was involved, namely '(a) ideologies of education as a source of national and world progress, (b) the hegemony of science as a critical means to development, and (c) the idea that educational systems and indeed, society in general, could be managed to produce desirable outcomes'. Between 1962 and 1992, Postlethwaite (2004, p. 27) was the driving force behind the International Association for the Evaluation of Educational Achievement (IEA) programmes. He argued that the two main reasons why Ministries of Educational Systems carried out assessment programmes were (a) 'to identify the strengths and weaknesses in the system at a particular point in time, and (b) to track changes in the system over time.'

One of the programmes that is currently in operation is PISA. This programme is sponsored by the OECD and is based in Paris. It is a triennial programme which focuses on competencies that 15-year-old students will need in adult life. It assesses what students can do with the knowledge and skills they have learnt. The first PISA

cycle was conducted in 2000 and then repeated every 3 years. PISA collects data on domain-specific knowledge and skills in reading, mathematics and science of students and schools, as well as their background information. Mathematics was the major domain in PISA 2015.

7.3 Equity in Learning Outcomes: Gender and Socio-Economic Backgrounds

Providing equal educational opportunities is one of the major goals for policymakers in many countries, including the five Southeast Asian countries involved in this study. A number of reports using PISA data have shown that school systems differ not only in their average performance but also in how equitably they distribute educational opportunities among students regardless of individual, family and socio-economic backgrounds (OECD, 2010). Equity in education is defined as 'providing all students, regardless of gender, family background or socio-economic status, with opportunities to benefit from education' (OECD, 2013, p. 13).

7.3.1 Gender

Questions pertaining to the differences between boys' and girls' abilities to perform within the study of mathematics has been a subject for study over approximately 50 years and has been heavily pursued in the United States, and more recently throughout broader regions worldwide. The development of the Trends in International Mathematics and Sciences Study in 1995 occurred because of marked differences in studies relating to varied education systems identified by the IEA in 1964. Longitudinal datasets have been produced from the survey data of mid-level and high school studies across a 40-year period and, more interestingly, clustered datasets for the last 25 years, owing to the recognition of a significant change in the results when viewed for gender bias (Hanna, 2000).

The more recent and relevant historical analysis of differences between male and female students' achievements studying mathematics suggests that the significant effects of learning and perceptions are developed during the preschool years and have a fundamental influence on student perceptions of expectations for future study (Penner & Paret, 2008). The expression of disadvantage for female students becomes most prevalent during the early years but is abolished by the time the students undergo testing in the middle grades (Penner & Paret, 2008). Other studies found that girls in high school have higher levels of mathematics anxiety than boys (Else-Quest, Hyde, & Linn, 2010; Hill, Mammarella, Devine, Caviola, Passolunghi, & Szucs, 2016). In addition, Cobb-Clark and Moschion (2017) disclosed in their study involving Year

3 pupils in Australia that boys in high socio-economic status families have higher numeracy test scores than girls have.

Other investigations have revealed that girls' achievements are more outstanding than boys have (Ejakait, Mutisya, Ezeh, Oketch, & Ngware, 2011). Another study undertaken in the United Kingdom was that of Cassen and Kingdon (2007), which showed that more boys performed poorly compared to girls. However, recent evidence indicates that sex-related differences in mathematics performance may have declined over the years and are at most small to moderate in size, favouring males on average, but not in every content domain (Else-Quest et al., 2010; Hyde, 2014; Van Mier, Schleepen, & Van den Berg, 2019). Other recent studies have reported no consistent sex differences across grade levels (Hyde, 2014; Hyde, Lindberg, Linn, Ellis, & Williams, 2008) and nations (Else-Quest et al., 2010).

7.3.2 Economic, Social and Cultural Status (ESCS)

Since the 1930s, it has been increasingly recognised in most countries worldwide that students' differences in social, cultural and economic backgrounds are strongly related to educational outcomes (Baker, Goesling, & Letendre, 2002; Coleman, 1987, 1988; Heyneman & Loxley, 1983; Joshi, 1995; O'Brien, Kopala, & Martinez-Pons, 1999; Reynolds & Walberg, 1992). In addition, a substantial number of more recent studies have suggested that there is a strong association between the ESCS and academic achievement (Hanushek & Woesmann, 2011; Hsu, 2007; McConney & Perry, 2010; Sirin, 2005; Thien & Ong, 2015).

As a consequence, many countries have introduced compensatory programmes to provide educational sources to assist those students in schools, universities and recurrent educational courses who are considered to be socially and economically disadvantaged. These educational services can be provided at the individual, small group or institutional levels in the form of opportunities to learn and financial aid to achieve equality in outcomes and greater equity in life. The major problems that have arisen have been concerned with whether the services are better provided at the individual or institutional level, as well as the identification of the individuals, small groups, or institutions in greatest need. The information required for the assessment of the nature and magnitude of the need involves the individuals, their homes, the communities in which they live and the institutions that operate in the different communities.

Family background was typically measured by examining a combination of the family's socio-economic status characteristics including parental education, income and the occupational status of one or both parents. Students from families with higher socio-economic status were expected to have more positive values towards education and better means and ways of supporting students during their schooling, compared to families with lower socio-economic status. These then induced higher academic performance. Because the family background was such a core factor affecting student achievement, it was often used as a control variable to test the effects of other variables (Willms, 1996).

Another family resource affecting student achievement was physical capital at home. The availability of resources with direct educational use such as own room, desk, books, computer, internet, dictionaries and other reference sources has been found to positively influence students' achievements (Kalmijn & Kraaykamp, 1996). Although physical capital positively influenced educational attainment, the size of the effect was found to be much smaller than that of family human capital (Wilkins & Ma, 2002). In fact, it was reasonable to infer that the family's physical capital was strongly related to the family's socio-economic status.

Consequently, the PISA index of ESCS was used in the present study. This index is derived from three family background variables that include (a) the highest level of parental education (PARED), (b) the highest parental occupation among the two parents (HISEI) and (c) the number and type of home possessions (HOMEPOS) that are considered proxies for wealth, educational resources available at home and cultural possessions (OECD, 2016).

7.4 Research Aims and the Hypothesised Model

The main aim of the present study was to explore the quality and equity of mathematics performance of students in Indonesia, Malaysia, Singapore, Thailand and Vietnam by examining the distributions and the levels of student performance on the PISA 2015 assessment, as well as the effects of gender and socio-economic background, using the PISA index of ESCS on student performance in mathematics. Considering the hierarchical nature of the PISA data used in this study, a two-level model was developed and proposed for testing as shown in Fig. 7.2. It is hypothesised that grade, gender and ESCS at the student level will influence students' mathematics literacy performance. In addition, at the school level, two other variables, percentage of girls (PCGIRLS) and the average ESCS (Mean_ESCS) will also influence students' mathematics literacy performance, as well as moderate the effect of the student-level variables mentioned.

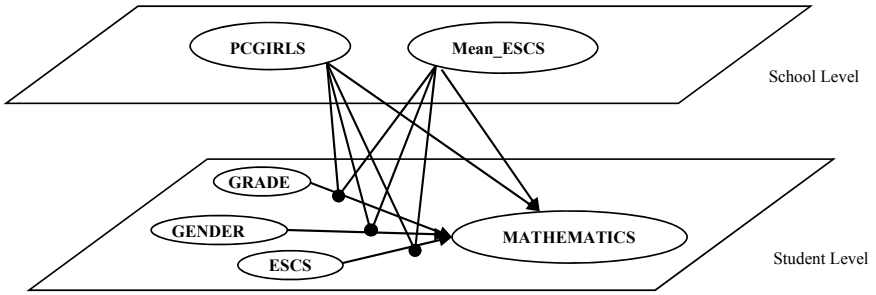

Fig. 7.2 The hypothesised model

7.5 Methods

7.5.1 Data

The data analysed in the present study were obtained from the PISA 2015 study that assessed students aged between 15 years and 3 months and 16 years and 2 months at the beginning of the assessment period. PISA employed a two-stage stratified sampling process. The first stage consisted of sampling individual schools, which were sampled systematically with probabilities proportional to size. A minimum of 150 schools was selected in each country. The second stage of the selection process sampled students within the selected schools. Around 35 students were then chosen with equal probability. The number of students to be sampled per school could deviate from 35 but could not be less than 20 (OECD, 2014).

The data for the five countries were extracted from the PISA database, which was comprised of 35,564 students in 1099 schools. Table 7.4 records the numbers of sampled schools and students for each of the five countries. The numbers of girls and boys chosen were almost equal. The grade distributions for students in these five countries are presented in Table 7.5. Most of the students in Malaysia (97.8%),

Table 7.4 Sampled schools and students

Country	#Schools	#Students	#Boys	#Girls
Indonesia	236	6513	3170	3343
Malaysia	225	8861	4163	4698
Singapore	177	6115	3142	2973
Thailand	273	8249	3597	4652
Vietnam	188	5826	2786	3040
Total	1099	35,564	16,858	18,706

Source PISA 2015 dataset

Table 7.5 Grade distribution

	All students (grade level)											
	7th		8th		9th		10th		11th		12th	
	n	%	n	%	n	%	n	%	n	%	n	%
Indonesia	110	1.7	425	6.5	2581	39.6	3245	49.8	151	2.3	1	0.0
Malaysia	0	0.0	0	0.0	175	2.0	8664	97.8	22	0.2	0	0.0
Singapore	4	0.1	109	1.8	482	7.9	5508	90.1	7	0.1	5	0.1
Thailand	16	0.2	51	0.6	2133	25.9	5799	70.3	250	3.0	0	0.0
Vietnam[a]	10	0.2	58	1.0	250	4.3	5212	89.5	1	0.0	0	0.0

[a]Missing data (n = 295, 5.1%)
Source PISA 2015 dataset

Table 7.6 Variables and measures

Variables	Description	Scale measure
Student level predictors		
GENDER	Sex of student	Female = 0, Male = 1
GRADE	International grade of student	Min = 7, Max = 12
ESCS	The PISA index of ESCS. This index was derived from the following three indices: highest occupational status of parents (HISEI), highest educational level of parents in years of education (PARED) and home possessions (HOMEPOS)	Index scores
School level predictors		
Mean_ESCS	School average ESCS	Mean scores
PCGIRLS	Proportion of girls at school	Min = 0, Max = 1
Outcomes		
MATHEMATICS	Five Plausible values for Mathematics performance	Scale scores

Singapore (90.1%), Vietnam (89.5%) and Thailand (70.3%) and approximately half of the students in Indonesia (49.8%) were in Grade 10.

7.5.2 Measures and Variables

The names, description and codes of the predictor variables tested for inclusion at each level of the two-level model are given in Table 7.6. At the student level, there were two variables, GENDER and ESCS, which were hypothesised to directly influence student achievement in mathematics. GRADE was included in this level as a control variable. In addition, two other variables were added at the school level as the compositional variables, PCGIRLS and Mean_ESCS, which were calculated by aggregating the student-level data.

7.5.3 Statistical Analysis

Use of International Database (IDB) Analyser

Initial data analyses at the student level were undertaken to explore the gender differences and the strength of the relationships between ESCS and mathematics performance using the IDB analyser developed by the International Association for the Evaluation of Education Achievement (IEA) Data Processing and Research Centre to facilitate the analysis of IEA's and PISA's large-scale assessments to take into account the use of ten plausible values and the complex sample structure of the data.

Missing data were excluded from the analysis using the list-wise method, where any cases that had a missing value for any variable were excluded.

Use of Hierarchical Linear Modelling (HLM)

Testing of hypotheses in multilevel models was undertaken using multilevel data analysis software, namely HLM6 for Windows (Raudenbush, Bryk, Cheong, & Congdon, 2004, 2008). The HLM program was initially developed to take into consideration the hierarchical, multilevel character of the data (Bryk & Raudenbush, 1992). This was necessary because 'the traditional linear models used by most researchers require the assumption that subjects respond independently to educational programs' (Raudenbush & Bryk, 2002, p. 2590). In practice, most educational research studies selected students as a sample who were nested within classrooms, and the classrooms were, in turn, nested within schools, and the schools were located within geographical locations. Under these circumstances, the students selected in the present study were not independent but were nested within organisational units. Ignoring this fact would result in the problems of 'aggregation bias and misestimate precision' (Raudenbush & Bryk, 2002, p. 2590). For this study, two-level models of student performance were developed for the investigation of achievement in mathematics.

7.6 Results

7.6.1 HDI and Mathematics Performance: A Context for Making Comparisons

Comparing student, school and country performances pose numerous challenges. Within a school, students who are required to respond to the same set of tasks have varying learning experiences, attitudes and social backgrounds. There may be differences in curricula, in the teaching and learning processes and in the demographic and social contexts of their student populations. Between countries, there is another layer of complexity because of the language used and the possible differences in the social, economic and cultural contexts of the countries being compared.

This section discusses the five countries' mathematics performance in the context of important economic, demographic and social factors that can influence the results of learning mathematics in schools. It provides a framework for interpreting the results that are presented later in this article.

Figure 7.3 plots the average mathematics performances of students on the Y-axis and the HDI values on the X-axis for the five countries. The relative size of the bubble for each country represents the relative size of its population. In addition, Fig. 7.4 presents the average mathematics performances of students on the Y-axis and the GNI values on the X-axis. The relative size of the bubble for each country represents its relative educational expenditure per capita.

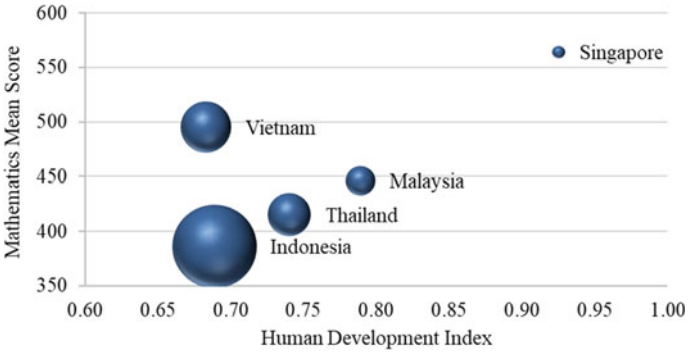

Fig. 7.3 HDI versus average mathematics performance for the five countries, with the bubble size proportional to the relative population

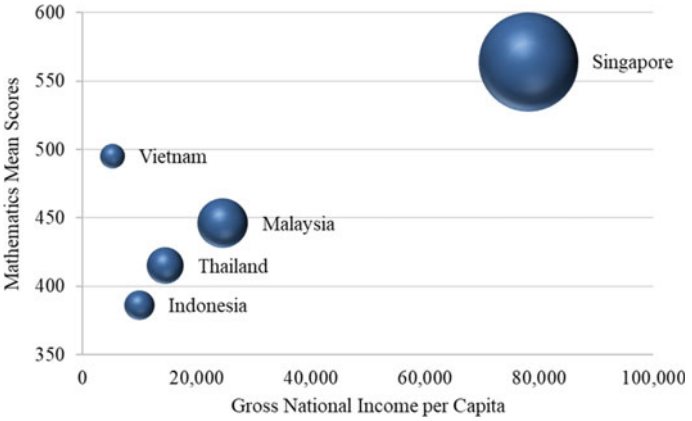

Fig. 7.4 GNI per capita versus average mathematics mean performance for the five countries, with the bubble size proportional to the education expenditure per capita

Singapore had the highest HDI value and mathematics mean scores among the five countries. Its population was the smallest, however, and its GNI and educational expenditure per capita were the largest. Indonesia, on the other hand, had the lowest mathematics mean scores, and the second lowest HDI, GNI and educational expenditure values per capita. Except for Vietnam, clear positive trends were observed for the four countries between student average mathematics performances and HDI. Vietnam, however, had the lowest HDI and GNI among the five countries and ranked second in terms of the students' average mathematics performances among the five countries that participated in PISA 2015.

7.6.2 *Trends in Student Performances*

Participation by the five countries in PISA since 2009 and the average scores of their students for mathematics are shown in Table 7.7 and graphically presented in Fig. 7.5.

As shown in Table 7.7 and Fig. 7.4, students from Malaysia and Indonesia performed better in 2015 compared to the previous stages in the cycle of testing in mathematics. The PISA 2015 student assessment results for Malaysia may not be comparable to those of other countries, or results for Malaysia from previous years because 51% of the initially sampled schools did not respond and did not meet the standard PISA response rate of 85% (OECD, 2016).

Table 7.7 Trends in mathematics performance 2000–2015

PISA cycle	Mathematics									
	Indonesia		Malaysia		Singapore		Thailand		Vietnam	
	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
2009	371	3.7	404	2.7	562	1.4	419	3.2	–	–
2012	375	4.0	421	3.2	573	1.3	427	3.4	511	4.8
2015	386	3.1	446	3.3	564	1.5	415	3.0	495	4.5

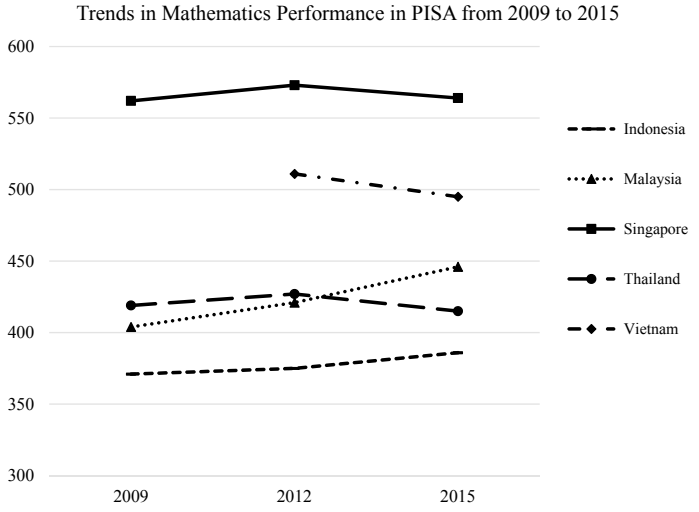

Fig. 7.5 Trends in mathematics performance

7.6.3 Single-Level Bivariate Results Using IDB Analyser

Gender differences

Gender differences (d) and standard error (se) related to mathematics performance based on PISA 2015 results are presented in Fig. 7.6. Gender differences in mathematics performance across the five countries are quite consistent, i.e. girls scored higher in mathematics. Girls performed significantly better in Malaysia ($d = -6.52$, $se = 2.70$). There were no significant differences in Indonesia ($d = -2.67$, $se = 3.64$), Singapore ($d = -0.13$, $se = 2.53$), Vietnam ($d = -3.05$, $se = 3.38$) and Thailand ($d = -2.92$, $se = 3.67$).

Correlations between ESCS and mathematics performance

Correlation coefficients between ESCS and mathematics performance and the associated standard errors based on PISA 2015 results are shown in Table 7.8. Across the five countries, the magnitude of the coefficients ranged from 0.31 to 0.38, indicating that there were significant moderate associations between the socio-economic status of the students in the five countries and their mathematics performance. The strongest

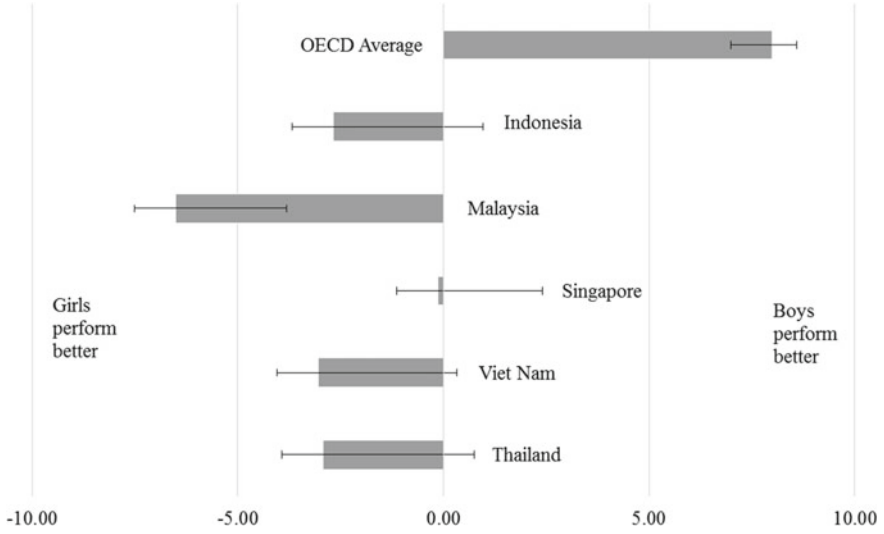

Fig. 7.6 Gender differences in PISA 2015

Table 7.8 Correlations between ESCS and mathematics performance

	Indonesia	Malaysia	Singapore	Thailand	Vietnam
Correlation coefficient (r)	0.31	0.37	0.38	0.32	0.38
Standard error (*se*)	0.05	0.02	0.01	0.03	0.03

relationships were found in Singapore and Vietnam with a correlation coefficient of 0.38 for both countries, followed by Malaysia ($r = 0.37$), Thailand ($r = 0.32$) and Indonesia ($r = 0.31$).

7.6.4 Multilevel and Multivariate Results

The multilevel models were built upward step by step in the HLM analyses. The first step was to run a model without explanatory variables, which is also called the 'null model'. This null model was fitted to provide estimates of the variance components at each level (Bryk & Raudenbush, 1992). The null model can be stated in equation form as follows:

Level-1 model

$Y_{ij} = b_{0j} + r_{ij}$

Level-2 model

$b_{0j} = g_{00} + u_{0j}$

where

Y_{ij} is the mathematics achievement of student *i* in school *j*.

The ten plausible values for mathematics were used for the outcomes in these models. Approximately 46% of the total variance in mathematics achievement in Indonesia was attributed to school differences, 39% in Malaysia, 34% in Singapore and 43% in both Thailand and Vietnam (Table 7.9).

The second step undertaken was to estimate the effects in which predictors were added at both levels. These four exploratory variables were grand mean-centred in the HLM analyses, except for GENDER, which was uncentred; thus, the intercept term represented the average student performance for the girls with an average level of ESCS in a school with an average proportion of girls and ESCS.

The final model can be denoted as follows:

Level-1 model

$$Y_{ij} = b_{0j} + b_{1j\,GRADE} + b_{2j}\,\text{GENDER} + b_{3j}\,\text{ESCS} + r_{ij}$$

Level-2 model

Table 7.9 Initial variance components

Variance Recorded	Indonesia	Malaysia	Singapore	Thailand	Vietnam
School	2932	2460	3104	3372	2975
Student	3504	3896	6110	4455	4006
Total	6436	6356	9214	7827	6981
% School	46	39	34	43	43
% Student	54	61	66	57	57

$$b_{0j} = g_{00} + g_{01}\,\text{PCGIRLS} + g_{00}\,\text{ESCS\_M} + u_{0j}$$
$$b_{1j} = g_{10} + g_{11}\,\text{PCGIRLS} + g_{12}\,\text{ESCS\_M} + u_{1j}$$
$$b_{2j} = g_{20} + g_{21}\,\text{PCGIRLS} + g_{22}\,\text{ESCS\_M} + u_{2j}$$
$$b_{3j} = g_{30} + g_{31}\,\text{PCGIRLS} + g_{32}\,\text{ESCS\_M} + u_{3j.}$$

The results are presented in Table 7.10. For mathematics performance across the five countries, it was found that after controlling for the differences between grade levels, both student characteristics, Gender and ESCS and school compositions, PCGirls and Mean_ESCS, had significant effects on student performance in some of the countries.

Boys performed significantly better in Vietnam ($b = 13.96$, $se = 2.53$). Boys and girls performed equally in Indonesia, Malaysia, Singapore and Thailand. Students with higher ESCS performed significantly better in Singapore ($b = 21.75$, $se = 1.61$), Malaysia ($b = 14.64$, $se = 0.91$), Vietnam ($b = 7.85$, $se = 1.48$) and Indonesia ($b = 7.12$, $se = 1.25$). Students in schools with lower proportions of girls performed significantly better in Vietnam ($b = -219.35$, $se = 28.42$) and Thailand ($b = -40.68$, $se = 15.61$). Students in schools with higher average ESCS performed better in all five countries: Singapore ($b = 58.83$, $se = 7.28$), Malaysia ($b = 40.82$, $se = 3.84$), Thailand ($b = 39.45$, $se = 3.25$), Vietnam ($b = 34.38$, $se = 4.41$) and Indonesia ($b = 34.30$, $se = 3.83$). In addition to their direct effects, these two compositional variables were found to interact with Gender and ESCS at the student level. In Singapore, boys in schools with high average ESCS ($b = 16.33$, $se = 6.09$) and a high proportion of girls ($b = 69.63$, $se = 27.43$) performed better and vice versa. ESCS effects were stronger in schools with higher average ESCS in Thailand ($b = 7.83$, $se = 1.34$) and Indonesia ($b = 3.80$, $se = 1.54$), but weaker in Singapore ($b = -9.66$, $se = 3.96$) and Malaysia ($b = -3.69$, $se = 1.64$).

The proportion of variance explained at the school (%School) and student (%Students) levels, as well as the overall proportion of variance, explained (%Total) at both levels are presented in Table 7.11. The four variables included in the models above explained approximately 9% of the initial variance available between students in mathematics in Malaysia and Singapore, 4% in Indonesia and Vietnam and 2% in Thailand.

For the variability between schools, the inclusion of the four predictors reduced the variance by 72% in Vietnam. More than half of the variance initially available between schools in Indonesia, Malaysia, Singapore and Thailand were also accounted for by the inclusion of these four predictors. In total, around 33% of the total variance in Vietnam and between 28 and 31% of the total variance in the remaining four countries were explained by gender, socio-economic and cultural indicators as measures of student characteristics, as well as measures of the composition of the schools using the mean value of these two variables.

Table 7.10 HLM results for mathematics

	Indonesia		Malaysia		Singapore		Thailand		Vietnam	
Fixed effect	b	se	b	Se	b	se	b	se	b	se
For INTERCEPT										
INTRCPT2	385.57	3.58	468.88	2.42	553.55	3.01	412.31	2.99	483.73	2.895.17
PCGIRLS	ns		ns		ns		−40.68	15.61	−219.35	28.42
ESCS_MEAN	34.30	3.83	40.82	3.84	58.83	7.28	39.45	3.25	34.38	4.41
For GRADE slope										
INTRCPT2	17.66	2.59	69.76	6.97	30.41	4.11	11.30	3.09	38.24	7.33
PCGIRLS	ns		ns		ns		ns		−114.61	30.13
ESCS_MEAN	ns		ns		ns		5.74	2.50	ns	
For ESCS slope										
INTRCPT2	7.12	1.25	14.64	0.91	21.75	1.61	ns		7.85	1.48
PCGIRLS	ns		ns		ns		ns		ns	
ESCS_MEAN	3.80	1.54	−3.69	1.64	−9.66	3.96	7.83	1.34	ns	
For GENDER slope										
INTRCPT2	ns		ns		ns		ns		13.61	2.53
PCGIRLS	ns		ns		69.63	27.43	ns		ns	
ESCS_MEAN	ns		ns		16.33	6.09	ns		ns	

Note ns = non-significant; b = metric regression coefficient; se = standard error

Table 7.11 Proportion of variance explained

	Indonesia	Malaysia	Singapore	Thailand	Vietnam
% School	57	67	70	65	72
% Student	4	9	9	2	4
% Total	28	31	29	29	33

7.7 Discussion and Conclusion

The availability of a large-scale assessment database that spans many countries across continents with large arrays of students, teachers, schools and community background variables provides information at the student, school and education system levels. This information can be used to make judgements about the effectiveness and quality of schooling.

The results of PISA 2015 using HLM approach show that across the five participating countries in the Southeast Asian region, there are wide gaps in the quality of the five education systems. The findings of the present study support the results reported by OECD (2016). Using student performance in mathematics, educators and policymakers in Indonesia, Malaysia and Thailand have a very large task associated with preparing their future generations for the twenty-first century and beyond. The performances of students in these three countries are significantly below the OECD average. Educators and policymakers in Singapore and Vietnam, however, may need to find ways to maintain their levels of performance and, if possible, excel even further.

In terms of gender equity, the descriptive statistics showed that girls outperformed boys in mathematics literacy in all five countries, with a very small gap in Singapore. The findings support the results from previous studies (Ejakait et al., 2011; Cassen & Kingdon, 2007) where girls outperformed boys in mathematics literacy. There is no doubt that gender differences are contextualised and vary across mathematics literacy (Hsu, 2007). The possible reasons to explain the performance gap between boys and girls are traditional gender identities and sociocultural factors (Maynard, 2002). The traditional gender identities demonstrate that schoolwork is generally a feminine rather than a masculine pursuit (Maynard, 2002). Girls are also more likely to be obedient and responsible for their schoolwork, whereas boys generally have a higher degree of autonomy and freedom to do what they like (Maynard, 2002). The decline in boys' mathematics performance has shown a dire need to inform policymakers to find a way to engage boys in education. It requires an in-depth investigation to examine possible factors that attribute to the decline in mathematics performance at the classroom, teacher or school levels.

However, boys and girls performed equally after controlling for grade level at the student level and socio-economic status at both student and school levels based on the multilevel analyses, except in Vietnam, in which boys tended to do better than girls do. The proportion of girls in schools has large negative effects in Vietnam and to a lesser degree in Thailand. These findings warrant further examination in future studies.

The positive effects of ESCS on student performance, after controlling for grade level and gender, are found to be significant in all countries except Thailand. The two strongest effects are found in Singapore and Malaysia. The average ESCS of schools also has positive effects on student performance in all five countries.

The findings imply that the socio-economic status between schools accounted for significantly more variation in students' mathematics performance compared to the socio-economic status within schools. The academic gap is evident within and between schools regardless of the level of socio-economic status. The findings of the present study support the results from previous studies that ESCS was strongly related to students' performance in mathematics literacy at both student and school levels (e.g. Coleman et al., 1966; Hanushek & Woessmann, 2011; McConney & Perry, 2010; Sirin, 2005; Thien & Ong, 2015). The findings provide insights into policymakers in the five countries to devote adequate attention to the current education system for reducing the achievement gap between schools with high and low socio-economic status, as well as between low and high socio-economic status students. One possible way to reduce the achievement gap between schools with high and low ESCS is to support those schools with low ESCS with a quality teacher workforce (UNESCO, 2009) and adequate allocation of educational resources (UNESCO, 2013).

Overall, Gender and ESCS explained approximately 9% of the initial variance available between students in mathematics in Malaysia and Singapore, 4% in Indonesia and Vietnam and 2% in Thailand. In addition, the inclusion of proportion of girls and school's ESCS reduced the variance at the school level by 72% in Vietnam, and by around 50% in Indonesia, Malaysia, Singapore and Thailand. In total, around 33% of the total variance in Vietnam and between 28 and 31% of the total variance in the remaining four countries were explained by gender, socio-economic and cultural indicators as measures of student characteristics, as well as measures of the composition of the schools using the mean value of these two variables.

The above findings can be used to evaluate the adequacy of the performance of an educational system in the five countries. With the level of mathematics performance significantly below OECD average, the policymakers in Indonesia, Malaysia and Thailand may need to investigate their curriculum as well as the process of teaching and learning to equip their students with the capacity to identify and understand the role that mathematics plays in their future life. The decline in boys' mathematics performance and the effect of gender composition at school, for example, has shown a dire need to find ways to engage boys in mathematics education. The significant effects of ESCS, both at the student and school levels, also need to be addressed to provide quality education and equal opportunities for all students, regardless of their individual characteristics and socio-economic or cultural background. Addressing these challenges will help the five countries to prepare their future human capital to face global competition. Furthermore, assessment can provide a valuable focus on the education system and has the potential to be a powerful and beneficial tool for change and reform.

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Chapter 8
Inspiring and Transforming the Pre-service Teacher Through Authentic Classroom Preparation

Robert Matthews

Abstract In this chapter, a course design was examined that sought to bridge the university experience of PSTs with the rich and complex reality of classroom life through a focus on authenticity. By augmenting concepts with richly authentic materials and introducing classroom encounters through microteaching with simulated misbehaviour, PSTs were brought close to the reality of the classroom. Carefully selected streamable, unscripted video footage of actual classrooms enabled the analysis of key sequenced strategies. Each analysed strategy was supported by conceptual accounts from lecture materials and readings. These strategies were then practised through microteaching with role-play scenarios where PSTs re-enacted authentic school student behaviours, including challenging misbehaviours. Concept, strategy and modelling came together in this course to bring the reality of the classroom as near as possible. The effectiveness of the design was examined through in-depth semi-structured interviews of course participants' post-teaching placements. Results showed a substantial positive self-assessed transfer in course learning into the school classroom—the primary goal of the course design. In addition to competence, a reduction in anxiety and stress due to a sense of preparedness was commented upon.

Keywords Behaviour · Microteaching · Relationship · Secondary education · Teacher education · Theory of education

8.1 Introduction

This chapter details the novel design of the course *Student–Teacher Interaction in the Classroom* (STIC) and explores its impact on teacher placement. STIC is one of the core courses of the pre-service teacher (PST) programme, *Master of Teaching*, delivered at the School of Education, the University of Adelaide. The stated aim of the course is to prepare PSTs for their classroom interactions in middle and secondary school settings. It has been designed to provide an authentic learning experience

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that mirrors the real-life encounters of the teaching placement. It is primarily a classroom management course, with a broader take on relationship building and adolescent and personality development. The enhancement of PSTs to successfully transition into the challenging classroom context is of substantial economic and strategic importance to all countries. As many as 50% of beginning teachers leave the profession after five years in developed countries, primarily as they cannot find a successful way of being in the school context (see e.g. Perryman & Calvert, 2020). It is intended that the promotion of authenticity in beginning teachers and the focus on real-life encounters, will lead to greater outcomes in successful classroom practice and consequently retention and career satisfaction.

The approach of this course through authenticity and real-life context appears to be highly valued by PSTs, judging from student anecdotal feedback and student surveys, and has accordingly received two faculty-teaching awards. However, despite such feedback, I was left with the question, 'does the learning from this course penetrate into the real-world context in subsequent school placements?' To answer this question, in-depth, semi-structured interviews were carried out with volunteer PSTs post-placement to explore the penetration of course insights into the real-life context of teaching placements.

The guiding thread in the course's design is *authenticity.* I had completed the predecessor to the Master of Teaching programme, the Graduate Diploma of Education, a decade earlier and so had my own placement experiences to guide the course design in addition to years of mentoring and hearing the placement stories of many PSTs. I can still recall the first two lessons of my own placement, a Year 9 science practical with a relief teacher (the mentor had gone to a conference) and a rowdy Year 8 mathematics class with no mentor teacher (the mentor told me he would be in his office, but I later found out he stood in the hall listening). Suffice to say, neither lesson went particularly well. When the inevitable misbehaviours started up, I was reliant on my own resources with no mentor presence to hold them in check. As tensions escalated, I quickly found myself yelling at the class, just as my teachers from school had done when I was a boy. It was a shambles. I never taught that way again, I was horrified at myself. It was not me, not my style, but something I had absorbed unknowingly as a boy that surfaced automatically in the pressure of the moment. From then on, I strove to find my own *authentic* way of teaching. I designed STIC to accelerate the process of providing PSTs with insights into themselves, their future students and the classroom context.

How has the theme of authenticity aided in the design of a course on classroom interactions? Authenticity is commonly 'understood as being true to one's self and is synonymous with such terms as genuineness or realness' (Thompson, 2015, p. 604). To someone to live authentically means to 'take hold of the direction of their own lives without the direction being determined for them by external factors' (Halliday, 1998, p. 598). In education research, authenticity has been defined by Cranton and Carusetta (2004b, p. 7) as 'a multifaceted concept that includes at least four parts: being genuine, showing consistency between values and actions, relating to others in such a way as to encourage their authenticity, and living a critical life'. What appeals to me most in these definitions is that they speak to a deeper potential for

growth and a fuller lived expression of the person. Living out of authenticity aligns strongly to what Jung (1954) called the individuation process. For Jung, this innate goal in life is to become ever more conscious. It is analogous to Maslow's (1950) self-actualisation attainment. Individuation is a life journey in which consciousness is continually transformed via striving for harmonious connection between the outer world we encounter and the inner life, our inner reactions, our personality (Jacobi, 1965). The challenges of life continually throw us out of harmony and into chaos. And so, the search to regain harmony is an endless one in this human lot of ours. But, it is precisely in these challenges that we can grow, that is, become more conscious, wiser, and more mature. And as we do so, we can comprehend and competently engage with more of life's complexities. The life of a teacher is replete with such challenges (Cranton, 2001; Cranton & Carusetta, 2004a). Similar to Jung, Erikson (1968), a neo-Freudian pioneer of personality development, realised this important relation between crisis and personality growth. Indeed, Erikson developed a stage theory in which passage to each successive stage required the overcoming of a specific crisis. This is the origin of the well-known term, the *identity crisis,* which marks the crisis of the adolescent stage. Erikson formulated specific stages throughout the life arc that framed a person's development; however, for Jung, the life journey was considerably more individual and organic and not something readily organised under such a structure. As a Jungian psychoanalyst myself, I have seen the transformation that is possible amidst a crisis. Jungian therapy is an acceleration of the natural, individuating process, but it is not for everyone, for few, perhaps wisely, are attracted to endure the heat of examining the dark places within themselves. But one does not need therapy to individuate. Life brings more than enough challenges to overcome. And if they can be faced with the wholeness of one's being, with authenticity, then the individuation process unfolds (Jung, 1990, p. 164).

The dual concepts of authenticity and individuation have been most developed in education theory through the area of transformative learning. Accordingly, the design of STIC was framed within this literature. So, before detailing the course design, it is helpful to provide a brief précis of this framework.

8.2 Authenticity and Individuation in the Transformative Learning Model

Transformative learning is an eclectic approach, originating in the late 1970s, which seeks to understand how meaning can be made of one's learning experiences (see Taylor (1997) for an overview of the origins and aims of transformative learning). The studies by Boyd (1991) and Dirkx (1997, 2000) introduced Jung's notion of individuation as a distinct approach in the transformative learning field. In a series of papers, Dirkx (1997, 2000, 2006; 2012a, b) developed the idea that if one can engage deeply in difficult situations, giving equal weight to the tensions experienced between oneself and others, then a transformation in consciousness can arise. Transformative

learning is 'a process that takes place within the dynamic and paradoxical relationship of self and other' (Dirkx, 1997, p. 83).

In part, this requires standing one's ground *while* remaining connected to others. To know who we are, we must first separate from the blind assumptions carried by the group. As Cranton and Carusetta (2004a, p. 290) stated that, 'For educators, separating from the collective of humanity means distinguishing one's own beliefs about teaching from the common rhetoric of how to teach. This process is transformative'. It is only when we know something of who we are that authentic relationship becomes possible. When we can stand our ground, sharing something of ourselves, without losing our position as a teacher, then we can connect to another authentically.

For teachers, individuation requires one to look at both what we want to see in ourselves and what we do not want to see (Cranton, 2001). The former is easy to do the latter is generally not. It is typically easier to offload the onus of a difficult situation onto the other and not ourselves. How often do we ask, 'what is it in *me* that contributed to this disturbing situation?' Individuation necessitates holding to the tensions of a situation and reflecting, rather than rushing to judge. An obvious example would be a disruptive class that we walk away from labelling them as bad or lazy children, end of the story, instead of asking, what is it in *me* that has contributed to this situation? How we handle the tensions of life is crucial, particularly for transformative learning.

Authenticity in the individuation process for teachers is about bringing one's full personality into the equation of their life. It is only when we are being honest during a challenge or crisis, at least with ourselves, that transformation is possible. PSTs often collide with the school context they find themselves. The school culture, mentor practices and pupil behaviours are all sources that may challenge the adaptation of what they bring if it is at odds with what is in front of them. However, it is in the building of relationships with pupils where authenticity is often most crucial. A degree of 'being oneself', making some personal disclosure, with pupils is often necessary to establish rapport and respect (see e.g. Cranton, 2006 or McDougall, 2015). There is, of course, a limit to this authentic disclosure, appropriate to the teacher–pupil context, but if handled judiciously it can have a transformative effect, building rapport and trust with the pupil.

Several authors have argued that authenticity is really narcissism, self-satisfaction at the expense of others (see Barry, Kerig, Stellwagen, & Barry, 2011; Hotchkiss, 2002). Aloni (2002, p. 104) goes as far as to say that authenticity is always tending to a 'nihilistic position according to which everything is equally good and beautiful and just as long as the individual's choice was authentic'. That one risks falling into a romantic idealism of the individual over their surrounds (Bendix, 1997). But this to me is the antithesis of transformative learning, for there is no possibility of change if the world is forced to assimilate to one's viewpoint. The key is the inclusion of the whole person, warts and all, in the authentic reflection and not some self-aggrandising gesture, which ignores anything unsavoury about oneself. Then, one is no longer being idealistic in its pejorative sense. And please note, I'm not demanding that PSTs *be* authentic. This would be imposing my own value onto them and that would indeed be a narcissistic move; a seductive trap I suspect many educators fall

into as pointed out by Bialystok and Kukar (2018). Rather, I seek to provide an authentic learning environment and model authentic teaching primarily to create an effective learning context, which may also stimulate those, who share my value, to explore and extend their own expression of teacher authenticity. The most effective way to inspire is to be authentic oneself, to model and not cajole.

8.3 STIC Course Design

8.3.1 Lectures—Real-Life Video Clips and Theory

Video clips demonstrating various classroom practices have been used since the early development of video technology to demonstrate various aspects of real-life classroom action (Blomberg, Renkl, Sherin, Borko, & Seidel, 2013; Le Fevre, 2004; Santagata & Guarino, 2011). With the recent advances in online video streaming, viewing has become much more available (Cannings & Talley, 2002; Schrader et al., 2003). STIC lectures are built around the careful analysis of 10, real-life, streamable video clips originating from the now-defunct Teachers TV website. Although this vast resource was sadly disbanded after cuts to education in the UK post the 2008 economic crisis, the video database was freely shared to several mirror sites allowing streaming on-demand to continue (see e.g. TeachFind (n.d.)). The clips are, thus, readily accessible to PSTs outside of lectures. Several tertiary educators have found the TeachersTV videos of use with their students (e.g. see Crisan, 2016 or Hajhashemi, Caltabiano, & Anderson, 2018). Out of the thousands of videos available, it is the *Teaching with Bayley* series I am particularly drawn to because this mirrors the experience of teaching placement so well. Most of these videos are of struggling teachers seeking mentoring from Bayley. He first records a lesson, then analyses the playback with the teacher, giving suggestions for improvement and then records a second lesson with the implemented suggestions. This arc parallels the experience of school placement where the mentor teacher gives feedback from their observations and recommends improvements at each iteration of a PST's lesson delivery.

Watching these 15 min duration clips in lectures I stop and discuss maybe 10 or 15 times, each time asking 'What is going wrong (or right) here? What would you do differently?' or 'What strategy would you attempt in response to this misbehaviour?' I have heavy input into this discussion, strongly scaffolding and informing the reflective eye of the PSTs in preparation for their observing each other microteach and absorb their mentor's criticism on school placement. The order of the clips is sequenced to build a range of strategies, commencing with basic *preventative strategies* such as teacher presence, praise, organisation, clear lesson structure and task delivery, then incorporating *supportive strategies* that nudge students back on the task who have started to drift off and, finally the more confronting, *corrective strategies.* This sequence is taken from Levin and Nolan (2007) and is used to structure

the main *Handbook* assignment for the course. We don't just stop at reflecting on strategies but also analyse the teachers in the clips themselves. What are they feeling and thinking, how might they have gotten into this situation? As an example, one teacher is afraid of her class 'going pear shape' [getting out of control] and so she says 'I would rather bore them at the start of a lesson'. And that is exactly what she does. Here, one can discuss the teacher defending herself from a state of tension that she could not resolve authentically [she could not see that she was doing anything wrong] and so is stuck. Indeed, even in the clip, she accuses the students of 'you're losing the plot people' and Bayley, in his polite manner, has to tell her, 'maybe it's not them, it's you'. This teacher could not reflect on herself, but rather blamed her pupils and had unknowingly launched a cold war with her class. To accept that a teacher can be the source inhibiting learning can be quite confronting for a PST. And it is unnecessary, for there are a dozen strategies that could lead the teacher out of her malaise with the class. What it requires is that she be authentic, and to look honestly and not defensively at the situation.

Theory in lectures is introduced in parallel to unpack and drill down deeper into the observations and analyses of key strategies identified in the video clips (e.g. Kounin's theory of the 'ripple effect' (Kounin and Gump, 1958) is provided to examine the shared patterns of pupil behaviour often seen in classrooms). I prefer to teach in this experiential way, always introducing the concrete and then moving to the abstract. Various management theorists are discussed, together with personality and learning development theories. The emphasis is on fostering a curiosity into the psychological drivers behind the surface experience of behaviours witnessed in the classroom.

8.3.2 Tutorials—Microteaching with Misbehaviour Roles

The formal idea of using simplified, shortened lessons, so-called microteaching, has been around for decades and is often said to have originated with Dr. Dwight W. Allen and his colleagues at Stanford University dating from 1963 (see Allen & Eve, 1968 or Grossman, 2009). Essentially, it comprises a mini-lesson of around 10 min duration given to a small group of five or so students. Many studies have been done showing an increase in teaching confidence and efficacy upon completion of microteaching exercises (Allen, 1966; Birney, Kong, Evans, Danker, & Grieser, 2017). Microteaching has been shown to reduce anxiety levels of PSTs (see, e.g. Remesh, 2013). Crucially, microteaching studies have shown greater reflection where PSTs show increased awareness to 'read' complex teaching situations and an increased strategy range to respond with (Bell, 2007; Diana, 2013; Fernández, 2010; Fernández & Robinson, 2006; Karlstrom & Kamza, 2019). It is difficult to estimate the proportion of ITE programmes that implement microteaching. Although the benefits are well established, the logistic demands are considerable—time demand on the lecturer, dedicated teaching spaces, organising equipment and the time needed to scaffold the PSTs into their microclass process.

In the tutorials of STIC, the PSTs in groups of six microteach a 12 min lesson, repeating these three times throughout the course. This means each PST teaches 3 microlessons and observes 15. After each microlesson, the group discusses and later uploads their written reflections to the microteacher. The reflections are scaffolded under headings to identify the various strategies of teaching and management. The microteachers also video record themselves for later playback. I also observe and join in their discussion. Each microlesson targets specific strategies that parallel the same sequence in lectures. For example, early on in lectures, the use of effective praise is illustrated in a video clip and explicated through Skinner's theory of operant conditioning and then, in tutorials, the PSTs are to experiment and apply this strategy for themselves.

Crucially again, as far as authenticity is concerned, the PSTs don't just observe the microlesson but are given roles to play, including two misbehaving roles, an attention-seeking student, and a kinaesthetic learner who gets easily restless and needs to constantly move in order to think. These behaviour roles appear to be relatively novel from my reading of the literature. Typically, where misbehaviour has been included in the microteaching literature, the approach is to devise a scenario (unknown to the microteacher) that is enacted by the 'pupils' and then let the microteacher respond (Mikulec & Harmann, 2019). This is my fallback position for groups that struggle to role-play at misbehaving. I prefer the microlesson 'pupils' to generate their own misbehaviour within the defined misbehaving roles. This brings a realistic aliveness to the microclassroom and for the many who never misbehaved at school, it allows them to realise why kids misbehave—it is fun and rarely personal.

The assessment for this exercise was to write up their reflections for each iteration of microteaching by assimilating all written feedback and their microlesson recording.

8.3.3 Authentic Assessment—The Handbook Assignment

Assessment becomes authentic when the product lives on in a real-life context important to the pupils future (Burke, 1993; Wiggins, 1993). Accordingly, the PSTs are to combine all the elements of the course into a compact handbook, written to be a user-friendly resource they can consult when needed on a teaching placement. It combines video analysis, strategy range and theory base along with key insights from their microteaching organised under the structure of preventative, supportive and corrective approaches to positive classroom practice (Levin & Nolan, 2007). The format and style were left to the discretion of each PST, with the invitation being to write the handbook that they would most want to have as a management resource on placement. This has generally led to high engagement, greater effort and radical handbook offerings such as a Confucian style from a Chinese international student, an alternative education modelled handbook, a Koran-based one, a do-it-as Bayley would, and many other variations. Students have often told me they did more work for this course than any other, not because of the requirements did, but because they were more interested and felt the direct benefit.

8.4 Research Question

The question to be answered by this research was: Do the apparent benefits of this course, which sought to mirror school placement as authentically as possible, transfer into the real-world classroom on placement?

8.5 Method

The following is a small-scale study intended to illuminate and frame the research problem. In-depth interviews were felt most suited to explore such a personal account as one's authentic beliefs and practices during the pressure situation of placement (for review articles of teachers' beliefs and their practices, see Fang, 1996 and more recently Darling & Richardson, 2009). The validity and delivery of semi-structured interviews is a well-established research methodology in education (see, e.g. Creswell & Creswell, 2017; Rubin & Rubin, 2011; Sedman, 2012). I am grateful to all the participants for assisting so generously with their time and candour.

In the present study, the interviews were performed after post-teaching placement to ascertain the context and experience of teaching placements and the strategies, reflections and reactions concerning the participants' classroom practices. Questions were designed to examine the recollection of materials and transfer of learning from STIC course experiences into real-world practice.

8.6 Interview Protocol

Questions were concisely designed so as not to tire the participant. The duration of the interviews was approximately 50 min. Interviews were conducted at the university in a private space without distractions. The interviews were audio-recorded (with the explicit permission of the participants).

8.6.1 Participants

Participants were sourced from the *Master of Teaching* programme, at the School of Education, University of Adelaide (EDUC 7202). Six in-depth interviews were carried out in total, one male and five female participants, ranging in age from 21 to 35 years old. All PSTs who had completed the course *STIC* and the two school placements (5–8 week duration) were eligible for the study. A general email was sent out to all PSTs meeting these criteria inviting them to participate in the study. The information sheet and all relevant forms (consent, etc.) were attached to this email.

In this email, participants were invited to email back or telephone if they wished any further information or had any questions they wanted to be answered. The first six interested participants were informed they had been accepted for the study and a time was arranged to meet. A further discussion was held with the researcher prior to the commencement of the interview to ensure the participants understood the nature of their participation and their written consent was obtained. The research protocol was assessed and passed by the Ethics Committee at the University of Adelaide's Office of Research Ethics, Compliance and Integrity [Ethics Approval No: HP-2013-085].

8.7 Interviews

All interviews were conducted by the author. Although there were several prepared questions (e.g. 'What strategies did you find useful during teaching placement?'), certain freedom was given in the interview to elicit a more textured and deeper account of the participant's recollections linking course and placement. All the interviewees appeared to relax into the interview, although some were nervous to begin with. All appeared keen to talk about their experiences on placement in particular. Probing questions without leading were used sparingly to test for links back to the course materials and experiences. No direct questions were asked targeting the authentic aspects of the participants teaching experience; rather through natural conversation around the topic, participants would disclose as they wished.

8.7.1 Data Interpretation

The data were thematically analysed through the five authenticity categories as defined by Cranton and Carusetta (2004b) (Table 8.1). Cranton and Carusetta arrived at these categories after a thematic analysis of interview and observation data of 23 educators over a 3-year period. Their study was structured following the grounded theory approach of Glaser and Strauss (1967) and Tesch (1990). A similar grounded theory view (for more recent accounts see Creswell & Creswell, 2017 and Lambert, 2019) was deemed appropriate to engage with this subtle and subjective phenomenon of authenticity.

8.8 School Placement Context

During the interview, the six participants profiled their school placement contexts as follows:

P1: Female, 23-year-old.

Table 8.1 Authenticity categories and properties of categories according to Cranton and Carusetta (2004b)

Category	Description	Property
Self	Possessing an understanding of oneself both as a teacher and as a person	Self-awareness
		Articulates values
		Congruence between values and actions
		Genuine
		Open
		Explicit
		Articulates teaching story
		Brings self into classroom
		Shows a passion for teaching
		Knows preferred teaching style
		Sees teaching as a vocation
Other	Possessing an awareness of others as human beings in the teaching and learning environment, especially students, but sometimes colleagues and individuals outside of the classroom	Awareness of students' needs and characteristics; for example, learning style, motivation, abilities and gifts, prior experience, developmental stages
		Interest in students' lives and needs outside of the classroom, including personal problems and obstacles to learning
		Interest in other individuals who may be a part of teaching—colleagues and the methods they use
Relationship	Possessing an awareness of the relationship between teacher and students. Carefully defined relationship between teacher and students	Caring for students
		Helping students learn
		Dialogue Sharing self with students
		Awareness of how power is exercised
		Teaching as relationship and communication
		Awareness of nature of the personal relationship with students
Context	Possessing an awareness of how the context of teaching influences self, other and relationship	Knowledge of discipline, subject area, content of teaching
		Awareness of the classroom environment

(continued)

Table 8.1 (continued)

Category	Description	Property
Critical reflection	Being critical of or engaging in critical reflection on each of the previous categories—self, other, relationship and context	Critically questioning one's own values, preferences, and experiences
		Critically reflecting on the meaning of student needs and characteristics
		Critically questioning one's relationship with students
		Critically examining the influence of context on teaching
		Critically questioning the norms and expectations present in the teaching context

Placement 1 was a country public school in NSW. Two Year 7 classes. One well behaved, the other incessantly chatty. The mentor teacher 'had given up' trying to change this and talked 'over the top' of the class. The Year 11 chemistry class was unmotivated and disinterested, which was 'a real surprise' for such a senior class.

Placement 2 was a public high school in Adelaide. A Year 10 geography class comprising students with a strong interest in physical education. A Year 11 gifted class. They were so focused on getting A's it was difficult to get them talking. Lateness and chattiness were the main problems at the school.

P2: Female, 22-year-old.

Placement 1 was at a public school in Adelaide. First two weeks was an intensive history course with Year 8s. No other subjects, just history … The kids said 'the teachers don't even know what's going on, why should I try.' After that, I taught the research topic and multimedia. It was not my area. I had to learn colour theory on the run. These classes were much chattier.

Placement 2 was in Ireland. Year 8 and 9 history (classics) classes (equivalent). Kids were wonderful but odd. Their teaching is very different. They don't lesson plan, but teach from texts. They laugh at you, if you lesson plan. The kids don't make any noise. So different to here, so used to kids being chatty, and doing lots of group work, whereas they sat quietly taking lots of notes off the board. I remember the first day, I said OK kids we're going to do some group work, and they looked at me and said, we're going to do what now? But it was great. They wanted to know a lot about Australia.

P3: Female, 27-year-old.

Placement 1 was at an elite private school. Three Year 11 classes. A strict way of doing things. Every student intends to go to university, so they are dedicated. Little need for behaviour management.

Placement 2 was at a public high school in Adelaide. More varied and challenging behaviours. The Year 10 science class had just done subject selection

for the following year and there were many boys who were not going into science and were very disinterested.

P4: Male, 21-year-old.
Placement 1 was a private school in Adelaide. Three classes, Years 7, 8, and 10. The kids were pretty settled.
Placement 2 was a public high school in country South Australia. Two Year 8 classes and a Year 10 computing class. These classes were much more difficult. Lots of disinterest and chattiness.

P5: Female, 31-year-old.
I did both placements at the same public high school in Adelaide. Classes were Years 9, 11, and 12 history. Had a really difficult mentor in the second placement. Took a lot of resilience to do it. Kids behaviour was generally excellent.

P6: Female, 35-year-old, International student from India.
Did both placements at the same public high school in Adelaide. Classes were Years 8, 9, and 10 science. This was a very difficult school, known for strong misbehaviour.

8.9 Responses and Discussion

In this section, we organize participant responses within the five Authenticity Categories of Cranton and Carusetta (2004b). Discussion is made within each category testing the effectiveness of the STIC course for its authenticity promotion.

1. Category of *Self*: Possessing an understanding of oneself both as a teacher and a person.

Responses themed under this important category showed that, for many participants, the course constructively influenced their belief structures and self-image as a teacher. Not only did the participants comment on what type of teacher they would like to be but also the values and strategies needed to achieve this goal. As P1 put it:

> I really loved in the course thinking about the bigger picture, what values I wanted to bring. Building relationships and not being authoritarian. The strategies allowed me not to compromise such things in the day-to-day pressures of the classroom. [The course] inspired me to think about things.

We spoke a lot in lectures about idealism needing to find realisation through the application of classroom strategies rather than being blunted through frustration with the real-life situation. The majority of PSTs preferred a relational to authoritarian style, but this remains a sentiment unless effective strategies can realise such a goal and its underlying values.

Often the PST is at first swept up into the pressures of placement but with pause and reflection can bring what they have learned in the course to bear on the lived situation. The following comment is from P5:

> We talked a lot in STIC about how we don't take things personally as a person, but you take things as a teacher, and that was a real learning curve for me. I got so offended and upset at the beginning of my prac [placement]. Especially these girls, Year 12 girls, I had about six of them. They moved as a pack, and talked the entire time I was speaking. They did it to the mentor too, but he has such a booming voice he talks through them. They talked the whole time, and I was so confronted by that, intimidated. It made me feel like I was 16 years old again. And then I stopped and thought, no it's not personal and so then I'd go and talk to them about their behaviour and their dresses, because that's what it was all about, the formal was coming up. After that it was fine, they listened a lot more.

The intended linkage across different components of the course was evident in many participant responses. In the following comment, P6 links her observation of video clips in lectures with microteaching in tutorials:

> I really remember Lauren. I remember when you showed those clips we talked about how she's lashing out because she is struggling in her life. I tried to use that psychology a bit to understand what was happening in class. Like we practiced in tutorials [microteaching], not to take it too seriously when they played around. With my difficult students I would wonder was it about the lesson or something that happened before. So I would go up and chat and be friendly. I have never carried my frustrations to the next day.

A further comment here regards my style of discussion in lectures. I prefer the PSTs to arrive at their own insights. I was particularly heartened by the following response from P3:

> It was mainly you. If I was struggling, I would see you out front and imagine what would you do? You speak in this quiet manner and you intrigue everyone, I don't quite know how you do it. You ask questions that require us to really think, we have to think about ourselves. And you wait.

We next move to our second category.

2. Category of *Other*: Possessing an awareness of others as human beings in the teaching and learning environment, especially students, but sometimes colleagues and individuals outside the classroom. Category of *Other*: Possessing an awareness of others as human beings in the teaching and learning environment, especially students, but sometimes colleagues and individuals outside the classroom.

Themed responses showing an awareness of pupil characteristics, concerning both class disruption and the learning process—the two are often related—dominated this category. For P1, it was a large number of kinaesthetic learners encountered:

> For the unmotivated Year 11 class, I needed to design something interesting. So many were highly kinaesthetic. It was just like the roles we played in tutes, amazing [microteaching misbehaviour role]. So I did group work, role play and field work, I took then on an excursion. I really enjoyed getting kids up to the whiteboard.

These were all strategies for kinaesthetic learners we had discussed in lectures and role-played during microteaching. The developmental characteristics derived from various theories in lectures and supported in video examples also assisted in framing and recognising certain classroom behaviours. P3 commented that:

> Teenagers are egocentric. That was another lesson from you that was constantly on my mind. They're still rough, developing kids.

And for P4:

> Oh yeah. It does make it all familiar to you. You can label what you are seeing 'cause you've had that experience of the clips. And that helps, at least it gives you a language with the teachers. It brings you an understanding of what you're talking about. Also learning about the development stuff is handy. It gives you another way of looking at it. Identity and the blocking factors.

A key set of strategies discussed in lectures and clips deals with motivating pupils. A common strategy was to find a connection to the learning content through relevance, a strategy implemented by P4:

> We had one boy who was just unhappy, he was always in a mood. I'm trying to get him excited about writing HTML, and he says he doesn't care. I remember that stuff about motivating them with something relevant, so I talked to him about writing a project he was interested in. And that got to him.

It wasn't just an awareness of the pupils shown in the clips but also the teachers, which was distilled into a template to characterise teachers encountered during the placement as P5 comments:

> Actually, we talked about them [the video clips] on placement. Like how you can identify some of the teachers we saw on the clips with the ones on placement. I worked with something doing French, she said how she just kept thinking about that French teacher [a TeachersTV clip] and what I have to do to just not be like her. That was really interesting.

The clips also provided examples of what not to do as a teacher. In the above-mentioned instance of the French teacher clip, far too much attention is given to off-task pupils resulting in a continual interruption of lesson flow. I find it very interesting that the participant did not comment that she wanted to reinforce on-task behaviour as she would have seen in a mastery video clip, but rather it is expressed as I don't want to 'be like' the one who fed off-task behaviours. This supports the course discussing a mixture of struggling and mastery teachers. The former has high emotional impact and may well resonate with a placement situation where difficulties often arise whereas the latter does not.

3. Category of *Relationship*: Possessing an awareness of the relationship between the teacher and students.

This was the strongest category from the participant interviews demonstrating a high value placed on relationship building. P5 remarked:

> The very last story you told me in STIC, was the first thing that happened to me. A kid said, 'Don't you have a go at me.' And I did what you said, and pulled him aside, and explained I wasn't having a go at him. Let's start over. And it was all good from there.

The one-on-one conversation was strongly emphasised in lecture materials and discussion, with a particular focus on listening rather than confrontation. I was gratified to hear many stories demonstrating this strategy.

In the following response, P2 shares how they drew from a particular video clip where the teacher used personal information as a negotiating tool in exchange for work being done. Many pupils have much higher social than scholastic interest, consequently the former can be used to barter for the latter:

> I'd negotiate, 'give me 5 min of good work, and I'll let you ask me a question about Adelaide.' I also remember the teacher that had a bunch of noisy girls in her class [video clip of a Year 10 accounting class]. And they wouldn't listen, but they did want to know about her wedding ring and look at the photos of her wedding. And she said if you do work, then I'll let you see the ring. And I think all of us that went to Ireland used that. Negotiation works.

Often the one-on-one conversation and negotiating through personal information are used together. P6, who was an international student and utterly taken aback by the extreme misbehaviours encountered on placement, tells:

> On the second prac my mentor got given the worst class, 5 of the worst students in the school. At first it was really tough but by the end they were putty in hand. I ended up having a beautiful relationship with the kids who were the naughtiest. I asked one girl about her piercings. Was it painful to get the stud in her tongue, can she eat easily? She said it was fine. I said you must be brave, when I got my ears pierced I cried like a baby. She really liked that and was much better with me from then on. It was on the video clips, Bayley would talk to the teachers, I realised what he was asking them to do was to build up relationship, more than routines. Everything is important but relationship more so. This is where I first learnt about doing this with students. Then there was that Beadle clip, where he builds relationship all the time.

P6 was so interested to understand this strange context of a dysfunctional school, with many broken families and drug issues; she asked to return for her second placement. We continue with her quote in the following section as it discusses her appraisal of the context and its effect on her teaching.

4. Category of *Context*: Possessing an awareness of how the context of teaching influences self, other and relationship.

P6 continues saying:

> What I felt, especially in this school, the kids are so naive and vulnerable, but they are also so hardened by their circumstances. And they are so wanting softness or whatever. I really felt like hugging them, which I can't do in Australia. I had the feeling sometimes it's all the child needs. If only they would not take that the wrong way. But that's how the world is developing. It's crazy. I think that's the worst the children are facing now. That distrust. There learning to distrust everybody. It is very important to earn their trust. The first day, oh we have a student teacher who talks differently, dresses differently and looks different. But on the last day, the kids are crying in class. Why are you going? We thought you were going to teach us next term. I now know I've made the right decision with this profession. Until that moment there is this doubt.

The deep conviction from STIC that relationship building is so important in such contexts had been fully realised by this participant. She was also mindful to use praise in this context:

> The other really big strategy that came from the handbook and videos was the use of praise. The Amy video came to mind a lot. I realised the similarity in the background of the kids [Amy taught with praise to build up the self-esteem of kids from difficult homes in London]. Most of the kids come from broken homes or parents who are unemployed. The kids are really open about how poor they are. The kids are aware of the situation at home. They need a moment to be children, they are not children at home. They just needed some adults to hold them and tell them how good they are.

The complex context of a real-world classroom took considerable adjustment for many. Here is a typical comment from P2:

> There was so much being thrown at us. I always felt I was at least three steps behind. The handbook definitely put everything on the page. It was all kind'a there and in my head and I knew it made sense and there was reason behind those strategies. To do the handbook in preventative, supportive and corrective it meant that I knew what the strategies were and which ones could then be used in different situations. And it was great when it clicked, some strategies could be used in more than one situation. It was great to have correctives as well, kind'a like an emergency handbook when something's gone wrong.

Here is a reflective comment from P4 concerning the developmental needs and limitations of his pupils:

> There was a group of two girls and a boy that were really chatty. The hardest thing is that sexual interest. I saw boys wrap sticky tap around their fingers till they turn purple to get the girl to come over, that caring thing. What I found useful was to talk to them in the hallway before class went in. Just to remind them. I told them I've gotta look after everyone in the class, if your shouting I explained, it's gonna mess everything up for everyone else. It reminded me of the chatty girls video clip and where the teacher does some negotiating. And they did want that connection with the teacher, I asked them what they want to do about all this need to talk, and they said one of their friends is sitting at the end of the row and they are trying to talk to him [calling out]. So I moved him closer, and after that they were fine. They worked much better for me after that. It became a bit more, we're all in this together. I did what Bayley said [in the clip], bring them a little bit of who you are. And they'll respond to that. I also explained why teachers want to know where you are [they wanted to go out to drink water] we have a duty of care. I don't think they understand.

This PST was particularly aware of the developmental context of his pupils. He was learning to share responsibility with the pupils by sharing with them the demands of the situation. This was mentoring their emergence as responsible young people, which drew directly from various parts of the STIC course.

5. Category of *Critical Reflection*: Being critical of or engaging in critical reflection on each of the previous categories—self, other, relationship and context.

Several participants commented that their anxiety towards their approaching placements eased after completing STIC. For P4, it was the microteaching that helped:

The role play in tutes saved me. I was so anxious before then. It gave me a feeling that I could do this thing. That's when I knew I was doing the right thing [becoming a teacher].

P2 was struck by the honest connection Phil Beadle, a relational style teacher, made with difficult pupils in the video clips recalling:

> I really remember the clip with Phil Beadle and the really difficult kids. One 'cause I was scared I'd get kids like that and just the way he really connected with the kids. He wasn't just the teacher he was a regular person. That definitely hit home with me I think. … Everyone connects with people better if they find similarities rather than, you know, you're an authority figure. Why should I listen to you? I remember this from school. You won't listen to them properly. You won't take on their advice unless they gain your respect. That definitely came from these videos, he kind'a just went into these kids that were such a problem and then they didn't seem like such a problem anymore. These kids who were really crazy in their school, were just kids with him. That really stuck.

This quote speaks explicitly to the participant seeking an authentic way of being with her students. For P1, it was Phil Beadle's novel lesson design that was an inspiration:

> And Phil Beadle, for his creative ways of doing … maybe sometimes I aim too high, trying to get to that creative level. I then like, lose it, make things a bit random. Maybe OK for this point in time [for where she is at in her development as a teacher].

Interestingly, several of the participants, just as I had realised on teaching placement, reflected how they wanted to grow beyond the teacher behaviours they witnessed as a child. P5 said:

> I was terrified of taking a student out for a one-on-one [conversation]. I've watched them through the window when I was at school and it would always lead to an explosion. But the way it was done in the videos we watched, it was completely non-threatening. Yep we're just having a conversation. And now from that I think I'm willing to try that. I didn't have to do it, but my friend Louise, you should get her in the study. She did that and it worked really, really well.

And a closing comment from P3:

> Yeah, I used a lot of strategies from the course. When I think back to what I did on teaching prac, I realise all that pedagogy and psychology kind'a just seeped into my head.

8.10 Conclusion

There is substantial evidence of the transfer of learning into the placement experiences from the STIC course materials as reified through the lens of authenticity. All participants had constructive recall and stories of implementation of course materials and experiences in their responses. The course materials provided a framing language to think through and discuss with the mentor and other PSTs the experiences of placement. Building authentic relationships with the pupils, especially difficult ones, was a strong chorus from all participants. I was particularly heartened by the regard to work openly, honestly, and caringly with pupils who, on the surface, were disruptive and difficult. Many also commented on employing receptive, not punitive, one-on-one conversations with their pupils. All participants used video examples of teachers as a relative measure to track their own progress in the profession. Sometimes this was done as *how not to be* and, at other times as *the teacher, they aspire to be*. Clearly, the

real footage of teachers in classrooms demonstrating a contrast of both inadequate and mastery situations provided a memorable polarity to reflect and track one's own progress. Finally, there was a clear reflection on whom 'I want to be as a teacher', which is the core reflection for those becoming authentic teachers.

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Chapter 9
Pre-service Teachers' Perceptions of Character and Well-Being

Mathew A. White

Abstract International research has established that well-being, engagement and belonging are crucial factors for establishing and maintaining positive learning environments in schools. This qualitative study investigated pre-service teachers' perceptions of character, well-being and pedagogy. Two questions framed this research, 'What are the perceptions of pre-service teachers regarding character and well-being in education'? and 'How do pre-service teachers describe the characteristics of a good teacher'? A total of 54 pre-service teachers volunteered to participate in the study from the Bachelor of Teaching or a Master of Teaching degrees. The anonymous survey included categorical questions, items from a slider scale, open-ended answers to questions on teacher character development, well-being and academic growth. The results generated descriptive data that is displayed via bar plots and analysis of open-ended questions focusing on participants' thoughts and feelings in their own words. This chapter argues that initial teacher education programme are fertile ground for integrating research-informed approaches concentrating on the teacher's role and exploring the pedagogies for creating and establishing positive student engagement and engaging learning.

Keywords Appreciative inquiry · Higher education · Teacher education · Teacher well-being · Well-being education

9.1 Introduction

At present, teaching is entering a complex period worldwide. The recent OECD (2019) *Education at a Glance* report notes that the teaching profession is ageing, with only 10% of teachers under the age of 30 and more than 35% over the age of 50. In many OECD countries, the 'share of primary and secondary school teachers among 50- to 59-year olds is larger than the share among 25- to 34-year olds, which raises concerns about future teacher shortages'; in addition, teachers earn less than other

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tertiary-educated workers (OECD, 2019, p. 26). With 70% of principals reaching retirement age, growing concerns regarding early career attrition rates in teachers, the status of teaching, attracting the best possible candidates to study teaching and teacher well-being have appeared as key issues. In increasingly complicated and interconnected education environments worldwide, previous studies have noted an increase in adolescent anxiety and depression (Adler, 2017; Adler & Seligman, 2016; Sachs et al., 2019), and student well-being and character development are a growing concern for principals and teachers (Donaldson, Dollwet, & Rao, 2015; Rusk & Waters, 2013). This point was confirmed in the 2019 Australian Principal Occupational Health, Safety and Wellbeing Survey, where, of the 2,385 participants, 84% of school leaders claimed being subjected to offensive behaviour over the last year (Riley, See, Marsh, & Dicke, 2020). The growth of the field has raised issues for the implementation of character and well-being programme in education more broadly (White, 2017, 2019; White & Kern, 2018; White & Murray, 2015).

As issues of teacher well-being abound with Australian teachers reporting some of the highest levels of occupational stress, along with their English and American counterparts in recent times, the topics of character development, teacher well-being, student well-being and education system well-being are all on the agenda (Heffernan, Longmuir, Bright, & Kim, 2019; OECD, 2020; Viac &Fraser, 2020; White & McCallum, 2020). Waters and Loton (2019, p. 2) argued that well-being practice 'is growing globally and is being applied in schools across Bhutan, China, India, Israel, the United Arab Emirates, the Kingdom of Saudi Arabia, Jordan, Australia, Mexico, Peru, North America, and the United Kingdom'. Similarly, in a study of school values and mission statements, Allen, Kern, Vella-Brodrick and Waters (2018) discovered that following academic motivation, mental health promotion was the second most prevalent goal of schools from a sample in Victoria, Australia.

The American psychologist, Lickona (2018), contended that 'character' is intrinsically linked with teachers, teaching and flourishing in education. While a recent Australian debate on the quality of teaching and initial teacher education (ITE) focused on graduates being classroom-ready and the growth of students, despite increasing concerns regarding adolescent mental health and well-being, the role of character and well-being appeared to be a second-order priority or, in some cases, was absent (Waters & Loton, 2019; White, 2017). Graduate teachers must demonstrate that they can have a positive impact on students and how they learn; that they know their content and how to teach it, and plan for and implement effective teaching and learning; that they can create and maintain supportive and safe learning environments; assess, provide feedback and report on student learning; and engage in professional learning and engage professionally with colleagues, parents and the community (AITSL, 2018).

Yet, research by Fernandes, Peixoto, and João (2019) and specifically Beutel, Crosswell, and Broadley (2019) focusing on pre-service teachers (PST) resilience, contend that 'resilience is even more important for pre-service teachers, in particular for those individuals who are transitioning to teaching from other careers as they have additional challenges to navigate' (Beutel et al., 2019, p. 608). Furthermore, school students are similarly concerned about their peers. For example, the recent

2019 Mission Australia Youth Survey Report records mental health as the number one concern of a survey of 25,126 15- to 19-year olds (Carlisle et al., 2019). In 2018, the top three concerns of over 28,000 15- to 19-year olds were issues around coping with stress, school or study problems, and mental health (Aldridge & McChesney, 2018; Carlisle et al., 2019; Powell, Graham, Fitzgerald, Thomas, & White, 2018).

Consequently, there is renewed interest in the role that character and well-being education can play in strengthening learning, teaching and school systems to enable students to flourish. International researchers have investigated and made a case for the significance of character and well-being education in twenty-first-century learning (Lavy, 2019). One model has been to reintroduce an 'apprentice' model for ITE. This has been met with widespread criticism from researchers who assert that, rather than promoting innovation, it compounds the status quo in teaching and learning. Paradoxically, given the pressures on the teaching profession, PSTs' data-driven perceptions of character and well-being continue to be an unresearched area, whereas evergreen and deficit-oriented topics such as resilient thinking (Mansfield & Beltman, 2019), thinking dispositions and resilience in PSTs (McGraw & McDonough, 2019) and resiliency strategies dominate.

As school leaders and teachers grapple with declining standards in literacy and numeracy, increased public scrutiny of standardised testing, the rise of depression and anxiety and the call for schools to unscramble more of society's challenges, it is claimed that there is a gap between ITE and the preparation of PSTs for the complexities and realities of character and well-being education (Slemp et al., 2017; White & Murray, 2015). The perspectives of PSTs on character and well-being are significantly under-researched topics. Loughran and Menter (2019) critique the 'classroom-ready' agenda and argue that 'If teacher education is to carry expectations of doing more than just training teachers to be classroom-ready, it must be able to establish a professional agenda for teacher development and growth that illustrates a "value-add" that makes a tangible difference' (p. 217).

9.2 The Present Study and Research Questions

While topics such as PST resilience are an important field as a strategy to prepare graduate teachers for the challenges of the profession, there is little, if any, research conducted on the perceptions of PSTs regarding character and well-being as they commence their education. Research focuses on issues related to training or equipping PSTs with resilience skills to navigate the complexity of the school environment before inviting PSTs to engage in self-reflection on the role of character in professional identity and well-being issues. This study aimed to unearth the perceptions of a group of PSTs towards character and well-being, together with how they describe 'good teachers' at a South Australian university. Uniquely, the study adopted an appreciative inquiry research design and theoretical framework to create a survey that focused on what is working well. In part, the study addressed the gap in the literature and investigated the following research questions:

Research Question 1: What are the perceptions of PSTs regarding character and well-being in education?
Research Question 2: How do PSTs describe the characteristics of a good teacher?

In this chapter, I contend that a value-add for ITE programme is to educate PSTs about evidence-based approaches to character and wellbeing education while learning the practice of teaching. I call for a strength-oriented approach to the professional development of graduates and present a new way of approaching the topic of teacher resilience or from the stance of bouncing back. To support this argument, I report on a study of the attitudes of 54 PSTs towards character and well-being who have little, if any, exposure to evidence-based character and well-being issues. This showed a professional knowledge and practice gap between PSTs understanding of the field and what is expected of them to be graduate-ready. First, I provide a review of current character and well-being theories; next, I outline the study's conceptual framework and appreciative inquiry, with reference to its application in education. Then, the method of the study is presented, including participant recruitment, demographics and data sources considered. Last, the findings of the study consider the impact on future ITE and potential programme redevelopment and improvements.

9.3 Defining Character Education and Wellbeing

This study adopted Berkowitz, Althof, and Bier's (2012, p. 72) definition of character education as 'the intentional attempt in schools to foster the development of students' and Huppert and So's (2013) definition of well-being to promote 'a combination of feeling good and functioning effectively' (p. 837). With the rise of character education and well-being education research, there is an increasing emphasis on developing strategic approaches for promoting flourishing learning communities in schools. These advances have received both support and criticism. For example, an over-emphasis on character and well-being education is criticised for taking attention away from some elements of twenty-first-century skills, namely foundational literacies, literacy, numeracy, scientific literacy, ICT literacy, financial literacy and cultural and civic literacy; student competencies, including critical thinking or problem-solving, creativity, communication and collaboration; and character qualities, including creativity, initiative, grit, adaptability, leadership and social/cultural awareness (Lavy, 2019; WEF, 2016).

While there is widespread agreement that character and well-being matter, there is little, if any, universal agreement on theories, frameworks, curricula, approaches or measurement strategies (McCallum, Price, Graham, & Morrison, 2017; Viac & Fraser, 2020). This paradox has been well summarised by McGrath (2018), who contended that the 'diversity of perspectives raises concerns about whether a comprehensive definition of character education is even possible' (p. 24). Most recently,

Berkowitz, Bier, and McCauley (2017) identified four key targets in character education as the development of moral, performance, intellectual and civic character. McGrath (2018) proposed the central features of a character education prototype, arguing that as a programme, it is school-based and structured, as well as addresses specific positive psychological structures, identity, moral growth, holistic growth and the development of practical wisdom.

However, for PSTs, a substantial challenge they face is that as they enter the teaching profession and focus on the development of discipline-specific knowledge and understanding, many do not automatically associate learning and teaching with well-being education or character development. Many are challenged by the complexity of the landscape of the classroom, student dynamics and the demands of individual students and the differentiation required of emerging professionals. In a review of the effectiveness, barriers and facilitators of ITE to promote well-being issues in schools, Byrne, Rietdijk, and Pickett (2018) and Shepherd et al. (2016) investigated 20 studies from the United Kingdom and Australia. Shepherd et al. noted that there was a short-term increase in the confidence level of PSTs to engage in well-being discussions; however, many reported that they lacked the confidence to 'effectively address the health and education needs of school pupils' (p. 721). Loughran and Menter's (2019) study investigated the attitudes of PSTs related to their perceptions of character and well-being and argued that it is a significantly under-researched area. Loughran and Menter contend that

> teaching needs to be seen as a profession, with its own set of distinctive professional knowledge (including skills, curriculum, and pedagogical content knowledge) and that, as with all professions, the best way of learning is through an interactive process involving scholarship, research, and professional experience (p. 221).

9.4 Theoretical Framework and Related Research

9.4.1 Appreciative Inquiry

The theoretical framework for this study draws on the literature of appreciative inquiry, which intentionally investigates the positive core of an individual, group or system. First, an overview of appreciative inquiry will be presented; then, why this theoretical framework is suitable for this study will be outlined. Given the focus of RQ1 and RQ2, I discuss what stages of the 4-D cycle will be applied in the study.

Appreciative inquiry was proposed by Cooperrider and Srivastva (1987) and further developed by Cooperrider, Whitney, and Stavros (2008). Appreciative inquiry leaves behind 'deficit-oriented' methodologies (Cooperrider et al., 2008, p. 1) and concentrates on what is working well, rather than using a deficit approach. Appreciative inquiry is used to investigate and engage participants and individuals at organisational levels, notably across the business and not-for-profit sectors. Over the past decade, appreciative inquiry has been adopted in education. Education researchers have also adapted the original appreciative inquiry theory, method and

process. It is increasingly adopted by researchers and school leaders in educational settings as a process for widespread employee and student engagement for individual course creation. The appreciative inquiry premise is that in all systems, there will be something that is working.

There are two cases to support the adoption of appreciative inquiry for the present study. First, an appreciative approach is consistent with the subject matter being investigated; second, many previous studies on the perceptions of PSTs regarding character and well-being have adopted a deficit-oriented lens. As summarised in Fig. 9.1, the appreciative inquiry 4-D cycle can be used to investigate a positive or affirmative topic choice of inquiry. In the present study, the affirmative topic chosen was 'quality teachers'. In the 4-D cycle, the researcher adopted the following process of inquiry: Discovery–what gives life, Dream–what might be, Design–how it can be and Destiny–what it will be.

In the present study, the first two stages of the 4-D cycle were adopted to design the survey and discover and investigate what might come from the perspectives of the participants. The present study adopted the appreciative inquiry 4-D cycle as developed by Sekerka and Cooperrider (2002) and expanded by Cooperrider et al. (2008, pp. 34–42). Quality teachers were chosen as the affirmative topic choice. The study focused on the first two stages of the 4-D cycle discovery (appreciating, valuing the best of what is) and dream (envisioning what might be) to underpin the development of online well-being survey questions and the interpretation of data.

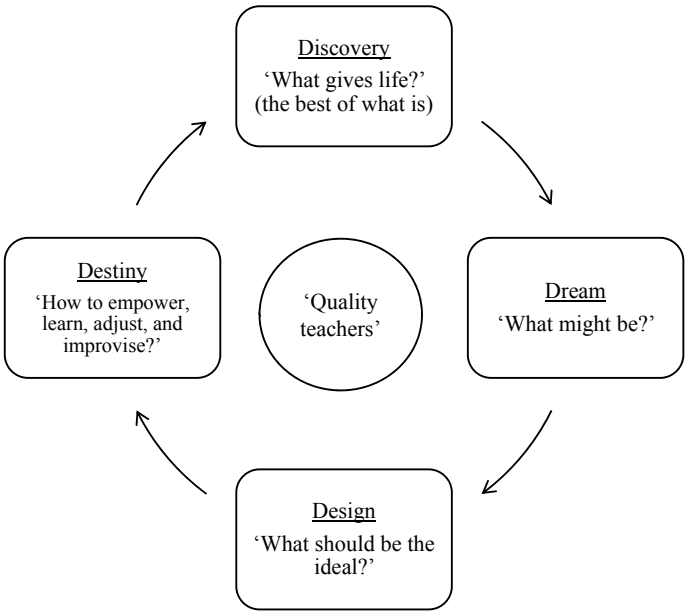

Fig. 9.1 The appreciative inquiry 4-D cycle (adapted from Cooperrider et al., 2008, p. 34)

Therefore, the participants' vision of the future was grounded in their historical and personal understanding of the past positive (Cooperrider et al., 2008).

9.4.2 Appreciative Inquiry Principles

Five principles underpin appreciative inquiry. These have been well established by Cooperrider et al. (2008) and Barrett and Fry (2005) and determine the basis of the method's theoretical assumptions. These five principles are constructionist, simultaneity, poetic, anticipatory and positive principles. These principles are related between and across each other like pieces of a puzzle and, when combined, the process enables researchers to interpret the participants' experiences in new and novel ways.

9.4.2.1 Constructionist Principle

The constructionist principle is foundational in that it is how participants' words create the worlds through which they see and interpret the world. The constructionist principle is critical in appreciating the perspective of the initial teachers. A potential root cause of interpersonal conflict within the formation of professional identity comes from the way individuals view the world. The teaching profession claims to have its own culture and way of seeing and creating meaning; this is captured via the constructionist principles of different PSTs will be different, depending on the way their words create worlds (Cooperrider et al., 2008).

9.4.2.2 Simultaneity Principle

The underlying assumption of the simultaneity principle is that inquiry creates change, and these are not mutually exclusive phenomenon. A premise of the simultaneity principle is that change begins once a question is posed. For example, as participants engage in a survey and answer the various questions posed, this acts as a catalyst for individuals to reflect on their role.

9.4.2.3 Poetic Principle

The poetic principle is based on how individuals choose to interpret words, images and texts in diverse ways and often will concentrate on what has resonance for them. Earlier AI research noted that participants often focus on what is wrong with a system, approach or theory, while the poetic principle challenges participants to respond positively and consider preferred futures.

9.4.2.4 Anticipatory Principle

The anticipatory principle argues that the images participants have for their future are a crucial factor in determining actions to move towards that future. For example, in the present study, participants were invited to describe what they thought were the characteristics of a good teacher.

9.4.2.5 Positive Principle

The positive principle is the underpinning approach for all principles throughout the AI process. Here, the explanation of Whitney and Trosten-Bloom's (2010, p. 54) research summarises this stance, claiming, 'positive questions lead to positive change'.

9.4.3 Applications of Appreciative Inquiry in Education Research

Godwin, Cooperrider, and McQuaid (2018), and Godwin and Adler (2018) discuss how appreciative inquiry can be used between and across culturally diverse groups in education. For example, Godwin and Adler (2018) reflected at the World Positive Education Accelerator held in Dallas in 2018 that the,

> process of appreciative inquiry was used to bring out the very best in education stakeholders from thirty-eight different countries who attended, and then design ways to embed this collective wisdom, shared dreams, and aspirations into human flourishing and wellbeing into the education equation (p. 22).

Godwin, Kern, and McQuaid (2018) extended this further and highlighted the application of the appreciative inquiry 4-D cycle in rural and metropolitan settings in both primary and secondary schools.

The application of appreciative inquiry in the university context was outlined by Escamilla, Ballesteros, and Cooperrider (2018), who discussed Universidad Tecmilenio's ecological approach to well-being across the university. The result was the widescale education of lecturers in positive psychology and well-being and the integration of well-being education courses across the university. Godwin and Lucas (2018) explored how George Mason University (Virginia, USA) used an ecosystem approach to systematically improve well-being for students and faculty over a 10-year strategy from a whole-of-university perspective. Appreciative inquiry has been used as a process to engage diverse stakeholders in the development of strategic planning by educational institutions seeking to introduce well-being education (Waters & White, 2015). This concept was extended by Godwin and White (2018), who investigated whether it was possible for education systems to create well-being cultures. In a pre- and post-control group mixed methods study, Bloom et al. (2015) documented

the adoption of the appreciative inquiry process to hold an Appreciative Education Conference, Office of Appreciative Education at the University of South Carolina's College of Education.

In another study, McQuain, Neill, Sammons, and Coffland (2016) investigated whether an appreciative inquiry approach to online assessment increased the levels of intrinsic motivation for students in an early childhood education course. They concluded that an appreciative inquiry approach 'made a significant difference in the intrinsic motivation of students included in this study, as shown by both the quantitative data reported above and the following qualitative data' (p. 82). McArthur-Blair and Cockell (2018) contended that a higher education appreciative inquiry summit can act as an institutional catalyst for change; they reviewed how appreciative inquiry has been used in higher education settings and asserted that common affirmative topics across university-wide summits include 'education for what purpose' and 'education for whom' (p. 61).

9.5 Method

The present study was undertaken at a South Australian university. It was a qualitative investigation, as the participants came from the same group; however, individual participants were not followed over time. Ethical approval for the study was granted by the participating university's ethics office (Approval No: H-2019-011). Participation in the survey was voluntary and anonymous. The researcher's aim was to recruit around 50 participants. The participants were taking up Bachelor of Teaching (double degree) and Master of Teaching at the researcher's university and gave informed consent. The anonymous online survey inviting the Bachelor of Teaching and Master of Teaching students was distributed by the relevant programme coordinators. Survey data were collected over two weeks at the start of the academic year. A total of 54 participants completed an online survey via SurveyMonkey, taking an average of six minutes to respond. Data were collected before major involvement in the academic programme of professional experience placements, with little, if any, exposure to concepts associated with character and well-being. All data were stored on the university secure storage system and were treated confidentially. No individual reports were generated. The researcher could not identify individual participants. The researcher was not a course coordinator for any of the sampled respondents.

9.6 Data Sources

9.6.1 Participants

A total of 54 pre-service teachers volunteered to take part in the study from the Bachelor of Teaching or a Master of Teaching degrees. A total of 60% of the participants were female; 34% were male; 3% identified as indeterminate, intersex or unspecified and 3% preferred not to disclose their gender. A total of 73% of the participants were studying Bachelor of Teaching with Bachelor of Arts, 11% were studying Bachelor of Teaching with Bachelor of Economics, 11% were studying Bachelor of Teaching with Bachelor of Mathematical and Computer Science and 5% were studying Bachelor of Teaching with Bachelor of Science. Out of the Bachelor of Teaching participants, 52% were in the first year of their degree, 13% in the third year and 12% in the fourth year. A total of 23% of the participants elected not to identify their year level. A total of 57% of the participants entered the degree via an Australian Tertiary Admission Rank, 4% with a Certificate 4 Transfer, 24% with an existing university qualification and 15% via a Special Tertiary Admissions Test. Many of the participants spent around six minutes and 20 s completing the study. With such a small sample size, the data collected was interpreted cautiously. With limited information about the participants' backgrounds, it was not possible to address all challenges in the research design, including survey issues such as potential voluntary response bias. However, this is recognised in the reporting of results.

9.7 Results

The results are presented in three parts. First, I consider the perceptions of PSTs regarding how relevant student well-being is to achieving learning outcomes; second, I look at how important PSTs perceive teacher well-being to engage and motivate students, where PSTs think character education happens, and present the results of how participants describe their understanding of character; third, I look at how participants describe their understanding of well-being. Last, I present the participants' responses to an open-ended question on the characteristics of a good teacher. In presenting the results in four sections, RQ1 and RQ2 were systematically addressed. Participants were invited to participate in the online survey via an online link directing them to a SurveyMonkey questionnaire. The link to the survey was emailed to them by programme course coordinators who took part in the data collection for the study.

When the participants were asked to show how relevant they perceived student well-being was to obtaining 'good marks' on a sliding scale from 0 (least important) to 10 (most important), the mean was 8.46 (standard deviation [SD] = 1.49). When participants were asked how important teacher well-being was to 'engage and motivate students', the mean was 8.85 (SD = 1.28). As summarised in Table 9.1, the participants were asked to rank where they thought character education for students

Table 9.1 Where pre-service teachers think character education happens ($n = 54$)

Response	Rank order
In class	1
During cultural activities (i.e. the arts, art club, choir, debating, drama and orchestra)	2
During sports	3
Community service	4
On an excursion	5
Other (please specify)	6

occurred and were invited to rearrange the diverse options provided. Responses to this question included in class, during sport, during cultural activities such as the arts, on an excursion, during community service and none of the above. Participants could also choose to specify an area not identified in an open text box. Participants ranked the options in the following order: in class, during cultural activities (e.g. the arts, art club, choir, debating, drama and orchestra), during sports, during community service, on an excursion, and finally, other places.

In the open text box for 'other', 11 participants noted that character development occurred 'outside of the classroom where they are able to interact with peers, with less guidance from teachers and staff members'.

> Outside the classroom, they have more freedom to explore who they are within their peer group because there is less of a chance, they are conforming to what is expected of them inside of the classroom. (P1)
> I feel that camps and outdoor education really emphasise the character of the students and can leave an impression on the students. (P2)
> When they are in an environment where they feel the most comfortable being themselves, allowing them to discover who they are. (P3)
> During one-on-one mentor conversations with teachers. (P4) Teachers building rapport with students have this influence.

Participants were invited to choose from seven definitions of character and which one they felt best aligned with their understanding of character (Table 9.2). These definitions were based on Baehr's (2017) study, *The Varieties of Character and Some Implications for Character Education.* It was only possible for participants to select one description. Significantly, participants had little, if any, exposure to the definitions chosen by the researcher. Participants were presented with seven definitions taken from various publications on character education. The name of the author of the various definitions was not provided. Participants could select from the following definitions of character:

Table 9.2 Choose the description that best aligns with your understanding of character ($n = 54$)

Description	Percentage
A person's disposition to act, think and feel in various ways (Aristotle)	52.08
The cognitive, emotional and behavioural dispositions needed to achieve human excellence in performance environments—school, extracurricular activities and work (Davidson, 2004)	29.17
A concern with certain distinctively civic goods or ends, such as the well-being of one's community or society as a whole (Battaly; Slote)	8.33
Strengths of a good 'neighbour' and are motivated by a concern with distinctive moral goods such as the alleviation of another person's suffering (Baehr)	6.25
Strengths of a good thinker or learner and are motivated by a concern with distinctively epistemic goods like truth or understanding (Roberts & Wood)	4.17
The ability to complete complex and challenging tasks across a range of 'performance' contexts, from school to work to athletics (Peterson & Seligman; Duckworth; Quinn)	0

- A person's disposition to act, think and feel in various ways (Aristotle, Thomson, & Tredennick, 1976).
- The cognitive, emotional and behavioural dispositions needed to achieve human excellence in performance environments—school, extracurricular activities and work (Davidson, 2004).
- A concern with certain distinctively civic goods or ends, such as the well-being of one's community or society as a whole (Slote, 2001).
- Strengths of a good 'neighbour' and motivated by a concern with distinctive moral goods such as the alleviation of another person's suffering (Baehr, 2013).
- Strengths of a good thinker or learner and motivated by a concern with distinctively epistemic goods like truth or understanding (Roberts & Wood, 2007).
- The ability to complete complex and challenging tasks across a range of 'performance' contexts, from school, to work, to athletics (Duckworth et al., 2007; Peterson & Seligman, 2004).

Based on the above definitions, 52.08% of participants chose Aristotle, Thomson & Tredennick (1976) definition, 29.17% chose Davidson (2004), 8.33% chose Slote (2001), 6.25% chose Baehr (2013), 4.17% chose Roberts and Wood (2007) and no participants chose Peterson and Seligman (2004); Duckworth et al. (2007). Following this question, the participants were asked to choose from five definitions of well-being that best aligned with their understanding as summarised in Table 9.3. The five definitions were from contemporary well-being literature. Participants could select from the following definitions of well-being from international research:

- autonomy, environmental mastery, personal growth, positive relationships, purpose in life, self-acceptance (Ryff, 1989)
- positive emotion, engagement, relationships, meaning, accomplishment (Seligman, 2011)
- feeling good and functioning well (Keyes & Annas, 2009)

Table 9.3 Choose one of the following descriptions that best aligns with your understanding of well-being ($n = 54$)

Description	Author	Percentage
A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity	WHO (1948)	26.09
Purpose in life, positive relationships, engagement, competence, self-esteem, optimism, contribution	Huppert and So (2013)	24
Autonomy, environmental mastery, personal growth, positive relationships, purpose in life, self-acceptance	Ryff (1989)	19.57
Feeling good and functioning well	Keyes & Annas (2009)	17.39
Positive emotion, engagement, relationships, meaning, accomplishment	Seligman (2011)	13.04

- purpose in life, positive relationships, engagement, competence, self-esteem, optimism, contribution (Huppert & So, 2013)
- a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1948).

A total of 26% of the participants chose the WHO (1948) definition, 24% of participants chose Huppert and So's definition (2013), 19.57% of participants chose Ryff's definition (1989), 17.39% chose Keyes and Anna's definition (2009) and 13.04% chose Seligman's definition (2011).

Next, participants were asked to rank what they perceived to be the relative importance of the topics commonly discussed in well-being and character education programmes in schools on a scale of 1–8 (1 being most important and 8 being least important). These topics included antisocial behaviour, belonging, engagement, physical health, resilience, relationships, spirituality and strengths. Participants ranked the following topics of importance in schools: number one was belonging; tied in second were engagement, relationships and resilience; in third were physical health and strengths; fourth was antisocial behaviour and last was spirituality (Table 9.4).

Table 9.4 Rank the importance of the following topics in schools (scale of 0–8) ($n = 54$)

Topic	Rank of importance
Belonging	1
Engagement	2
Relationships	2
Resilience	2
Physical health	3
Strengths	3
Antisocial behaviour	4
Spirituality	5

9.7.1 Open-Ended Survey Question Data

An open-ended survey question asked participants, 'In your own words, how would you describe the characteristics of a good teacher'? Responses varied in length from complete paragraphs of four to five sentences to one-word answers. Data were interpreted using grounded theory. Following data collection, similar participant responses were coded and categories were formed; this enabled me to uncover patterns of data. These were coded accordingly, looking for patterns from individual responses. From this, a theory interpreting the participants' explanations of the characteristics of a good teacher was established: the participants' descriptions were being approachable, caring, good with communication skills, compassionate, empathetic, engaging, kind and motivating. To give the reader a richer appreciation of the perspectives given by the participants, the following examples are provided. Throughout the responses, it was evident that participants believed teachers should know their students and be passionate about their discipline. For example, Participant 6, a male first-year Bachelor of Teaching and Bachelor of Arts PST, noted

> A good teacher must be engaging and have a passion for their teaching subjects. They must also have excellent communication skills. Otherwise, the content they try to teach and the advice they try to give may go over the students' heads, as they may not understand what the teacher is trying to say. (P6)

Student behaviour management and listening skills were emphasised by Participant 7, a first-year female Bachelor of Teaching (Secondary) with Bachelor of Economics PST, who wrote

> A good teacher can realise most of the situation that students [*sic*] misbehaviour and can adjust it. Also, a good teacher will have superior [*sic*] listening and communication skills reflecting with students and parents. (P7)

The formation of a professional identity was well-characterised in a grab-bag of character qualities and skills and a note of caution as Participant 9, a female Bachelor of Teaching (Secondary) with Bachelor of Arts PST, asserted

> The characteristics of a good teacher would include things such as - The ability to explain things in different ways so as to be understood - Kind - Compassionate - Fair - Respectful - Approachable - Interested in their students - Interesting/exciting, not monotonous. These are only a few of the characteristics. But as a general statement, a good teacher would be someone who cares about what happens and is not a robot. (P9).

Recognising the significant role that a teacher can play as a consistent role model, Participant 11, a female Bachelor of Teaching (Middle) with Bachelor of Arts PST, reflected

> Some [one] who is able to be consistently present in the lives of their students, as not all students have consistency outside of the school/classroom environment. A person who is compassionate, understanding, and able to be a positive role model. A person who has an understanding of the impact of mental health issues and how they can effect [*sic*] the wellbeing of students inside and outside of the classroom (P11).

Of the 54 participants, number 11 was the only one to highlight the significance of 'understanding of the impact of mental health issues and how they can effect [*sic*] the wellbeing of students inside and outside of the classroom' (P11). The significance of the teacher–student relationship for optimal learning was extended by Participant 12, a first-year male Bachelor of Teaching (Secondary) with Bachelor of Science PST, who argued

> A good teacher in my eyes is one who is able to connect with the students and make them really want to succeed in the subject they teach, The teacher also must be understanding and compassionate for the students and be willing to help anyone that needs more help. They should have the authority and patience to deal with any situations that may arise. (P12)

Greater focus on the socio-emotional aspects, the impact of culture and the cultural identity of a teacher's character was noted by Participant 20, a first-year female Bachelor of Teaching (middle) with Bachelor of Arts PST, who observed

> A good teacher should be sympathetic and empathetic of the students and understand that every child/student comes from a different background, which should be considered when in the classroom. (P20)

On the other hand, Participant 30, a female Master of Teaching (middle and secondary) PST, highlighted the importance of passion and engagement, as well as other desirable character qualities:

> Good teachers are passionate about their jobs but also have other interests, are empathetic and good communicators, approachable, reliable, honest, have integrity, and are organised. (P30)

The subtlety of this point was further highlighted by Participant 38, a female Bachelor of Teaching with Bachelor of Science PST, who emphasised the key role of listening in the teacher–student interaction, and wrote

> Someone who is willing to listen as well as teach, someone who builds understanding rather than dictates and expects others to immediately follow. A good teacher acknowledges participation and welcomes input, even from questions that might be outside of their personal understanding. Someone who is willing to say [*sic*] 'I am not sure of the answer; let's find out together'. (P38)

Furthermore, Participant 39 highlighted the view that teachers need to adapt to a school or classroom's culture and context. Participant 39, a male Master of Teaching (Middle and Secondary) PST, also recognised how the nature of teaching and twenty-first-century learning is impacting teaching and reflected

> I think that a good teacher is one that displays sincere willingness to be malleable in their approach to pedagogy and teach their students with engaging activities so as to develop problem-solving skills and critical thinking. The role of the teacher has shifted from simply delivering content knowledge to students to a more involved and nuanced constructivist approach that can set students up for the future landscape of the job market where these skills will be imperative to possess. (P39)

Another female Bachelor of Teaching with Bachelor of Arts participant identified the significant professional expectations of teachers and said

> I believe that good teachers need to be highly dedicated and passionate about their role. If they love what they are doing, I believe students will respond in kind and absorb the knowledge being imparted on them easily. I think teachers also need to be compassionate and empathetic as well as approachable. Students need to feel supported in their learning and as if they can discuss issues with their teacher. (P45)

In this section, I have presented how the participants explained their perception of the characteristics of a good teacher. While the results are based on a small sample size limited to participants studying Bachelor of Teaching and Master of Teaching, if the study was replicated with a larger sample size, it could imply that data-driven and evidence-based discussions related to issues of character and well-being should be integrated into ITE to prepare PSTs more effectively for the challenges of school life.

9.8 Discussion

To date, there have been very few studies regarding the attitudes of PSTs towards character and well-being. The findings from the results section of this chapter highlight the significant opportunity the discussion of character and well-being can bring to ITE; at the same time, it fulfils teacher registration requirements. The present study provides new perspectives on the attitudes of PSTs towards the topics of character and well-being at the start of their teacher education programmes. Encouragingly, the findings suggested that while PSTs are critical of and reflect carefully on the social-emotional aspects of teaching and the knowledge required to be a good teacher, they have limited sophistication in being able to articulate the characteristics of good teaching fully. Intuitively, participants chose an Aristotelian definition of character. In addition, while the majority of participants chose the WHO's (1948) definition of 'wellbeing not merely the absence of disease or infirmity', there appears to be little evidence of a multidimensional perception of well-being and character (Preamble to the Constitution of the World Health Organization, 1948).

Below I discuss four themes that appeared from the data collected and weigh up the implication for the future development of ITE programmes. The findings suggest that the participants perceived issues of character and well-being as essential factors in teaching. Little evidence was found to support the view that participants have a nuanced appreciation of character in teaching—they showed little awareness of data-informed and evidence-based definitions of the well-being theory. The findings support the argument that the systematic study of the topics of character and well-being integrated with professional practice could be a significant added value for ITE programmes. The study, therefore, provides data to craft programme redevelopment and discussion on these topics. Strikingly, given the prevalence of well-being issues in schools, only one participant explicitly thought that excellent teachers would have an awareness of the mental health and well-being of their students.

9.8.1 Perceptions of Pre-service Teachers Regarding Character Education

When respondents were asked to consider where they thought character education occurred, participants ranked the options in the following order: in class, during cultural activities, during sports, community service, on an excursion or other. Respondents were not provided with the choice to have 'all of the above'; however, it was possible they could specify this under other. Evidence from respondents illustrated that many PSTs believed that character education was something that occurred in the classroom and not an approach that took place outside of the formal curriculum. When considering the respondents' answers, the most surprising was that respondents did not think that an excursion could be a chance to discuss character. These findings showed that the perceptions of PSTs regarding character education were fixated in the classroom. This is natural, given that the first and second years of Bachelor of Teaching courses focus on issues surrounding pedagogy. However, it also illustrates the opportunity for programme enhancement to open discussion and dialogue in tutorials regarding the holistic nature of teaching and how classrooms are only one place where education occurs.

9.8.2 Perceptions of Pre-service Teachers Regarding Character

When data were collected in 2019, the PSTs in the Bachelor of Teaching and Master of Teacher had very little, if any, exposure to the concepts of character development, character education and well-being (unless they had encountered these concepts in their own schooling and we did not ask this question). When provided with a list of definitions of character taken from philosophy, economics and psychology, the majority (52.08%) of PSTs stated that Aristotle's broad definition was their preferred interpretation of character. Therefore, at the time, the PSTs did not necessarily link academic achievement, growth, musical ability or elements like being a good team member as being part of character. While Aristotle's definition is generic, it is not explicitly educational in focus. Another way of viewing these results is that PSTs at this stage of their ITE did not readily link the roles among schools, schooling, education and teaching with the formation of character and thereby good citizenship. Another interpretation is that, initially, PSTs interpret character as individualist as opposed to being about the development of good character for the 'civic good' or the 'strengths of a good neighbour'. The interpretations of these results, while highlighting a note of caution, do reveal fertile ground for the discussion of character and its development in education from both a philosophical and empirical perspective, as well as from the perspective of ITE. Moreover, the future programme objectives could provide a useful starting point for the discussion of the ethical and moral implications of the teacher's role in the discussion of character development (Cohen & Morse, 2014; Collie & Perry, 2019).

9.8.3 Perceptions of Pre-service Teachers Regarding Well-Being

In the literature, there is limited discussion regarding the attitudes of PSTs towards well-being. Evidence collected from respondents illustrated that 26.09% of PSTs believed that the WHO's (1948) definition of well-being aligned with their perception and 74% chose the more positively oriented definitions by Huppert and So (2013), Ryff (1989), Keyes and Annas (2009) and Seligman (2011). This shows that there is an opportunity for debate and discussion about the paradox of well-being with PSTs as they are forming their professional identity. The WHO's definition has multiple sides, but all its meanings focus on an 'absence of disease …'. This deficit view overlooks the many positive elements of well-being that are identified in Huppert and So's (2013), Ryff's (1989), Keyes and Annas' (2009) and Seligman's (2011) definitions. Herein lies a significant opportunity for debate and discussion with PSTs regarding the nature of well-being in several settings, including teacher well-being, whole-school well-being, year level well-being, class well-being and student well-being. Besides, there are significant opportunities to consider the various (1) character-based, (2) scientifically formed and (3) empirically based approaches to well-being in education currently offered in Australian schools.

9.8.4 Perceptions of Pre-service Teachers Regarding the Characteristics of a Good Teacher

What constitutes a good teacher is highly subjective. However, this is one conversation during ITE that would help PSTs reflect on their own experience as students and the emergence of their teacher professional identity. Evidence collected from respondents focused on a teacher's professional knowledge and professional practice, that is, PSTs recognised that good teachers will know students and how they learn, know the content and how to teach. To a lesser extent, respondents identified the importance for teachers to seek professional engagement.

9.8.5 Limitations

This study focused on the perceptions of PSTs regarding character and well-being as they commenced their ITE. This was a qualitative descriptive study; therefore, no inferences were made from the analysis. A limitation of the study was the uptake from the cohort. This is a challenge faced by many studies looking at the perspectives of PSTs.

9.9 Conclusions

This chapter examined the attitudes of 54 PSTs towards character and well-being. White and Kern (2018), Waters and Loton (2019), McCallum, Price, Graham, and Morrison (2017), White (2019) and White and Murray (2015) have argued that to equip graduate teachers with the skills required for twenty-first-century learning and teaching, the topics of character and well-being should play a part in narrowing the research and application nexus. In this chapter I asked, what are the perceptions of PSTs regarding character and well-being in education? How do PSTs describe the characteristics of a good teacher?

After investigating the perceptions of PSTs, I found that there is fertile ground to integrate more discussion of the philosophy of character and data-driven and evidence-based approaches to well-being education. Moreover, there is significant scope to combine this with PSTs' understanding of the APST. As illustrated by the responses of the participants, PSTs intuitively showed an awareness of the role of character. However, they lack the theory and knowledge about the philosophical and empirical approaches. How this should be achieved is not the purpose of this chapter. However, following the analysis of the perceptions of this group of participants, it would be beneficial for enriching how PSTs get to know their students and how they learn, plan for effective teaching and learning and create and maintain supportive and safe learning environments. Despite such limitations, these initial findings provide the foundation for more comprehensive studies and potentially a longitudinal study on character and well-being from the perspective of PSTs.

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Chapter 10
Shaping Professional Development of Educators: The Role of School Leaders

Lynda MacLeod

Abstract This chapter focuses on the influence of principal leadership on practising teachers' continuous professional learning. It adopts a qualitative methodology and reviews the findings and recommendations of recently published peer-reviewed journal articles and the occasional international policy report, which explicitly refer to principal leadership and its role in teacher professional learning to enhance student learning. The results of this systematic review suggest that leadership is a crucial element in impactful teacher professional learning. The chapter provides a list of strategies that school leaders can employ to increase the likelihood of more effective teacher professional learning in their schools. Some considerations for principals include adopting a blend of transformational and instructional leadership approaches; building trust and credibility; making the learning of teachers, as well as students, their focused priority and providing a range of support mechanisms to ensure that allocated professional learning delivers improvements in teaching quality and practices that will result in increased student learning outcomes. This chapter adds to the research knowledge that suggests that leadership has an indirect impact on student learning and that teachers' continuous professional learning must become more effective if it is to deliver the necessary positive growth in student learning.

Keywords Education policy · Educational leadership · Instructional leadership · Professional development of educators · Transformational leadership

10.1 Introduction

As we are now in the third decade of the twenty-first century, it is timely to reflect on some matters dominating the educational debate of the past two decades. These decades have seen a demand for educational change and improvement high on the list of policy and research agenda items. A consistent chorus of demand for improvement in the quality of schools, and especially the quality of teachers, can be heard from

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policymakers as well as the media (Mockler, 2015). Educational leadership has also received a great deal of attention in recent years as research has confirmed the impact that effective leadership has on student learning and outcomes.

The ability of high-performing principals to develop not only the children in their organisations, but also the adults is essential. It is also essential that principals have high expectations of both students and teachers (Gurr, 2015). Developing 'teaching expertise, developing assessment of student learning that informs the teaching program, developing greater student ownership of their learning, utilising current learning technologies, and ensuring learning spaces are inviting and conducive to good teaching' (Gurr, 2015, p. 144) is an imperative in the current educational climate.

The oft-repeated claim that school leadership is second only to classroom teaching as an influence on pupil learning has focused attention on leaders at both the school and system levels. Drawing on the ever-increasing body of quantitative impact studies, Leithwood, Harris, and Hopkins (2019) revised their original (2008) claim regarding the impact of school leadership to read

> School leadership has a significant effect on features of the school organisation which positively influences the quality of teaching and learning. While moderate in size, this leadership effect is vital to the success of most school improvement efforts (p. 2).

Although these authors focused on the responsibility of all levels of distributed leadership to create the necessary enabling conditions to promote highly effective teaching that translates into improved learning outcomes, the focus of this chapter is directly on the 'vital' role of the principal. So, what is the precise role of the principal, particularly in improving the programme of instruction?

Educational leaders are increasingly asked to be transformational leaders, leading change in organisations and systems as the gathering pace of economic and social change is requiring schools to equip students to participate in a rapidly changing workforce. As such, the leadership repertoire of effective leaders has grown from 14 identified specific practices to 22 since 2008 (Leithwood et al., 2019). This growing set of skills adds to the workload of school principals. Yet, unequivocally, 'school leadership matters greatly in securing better organisational and learner outcomes' (Leithwood et al., 2019, p. 12).

To engage in continuous improvement, we need a well-informed teaching force, which clearly understands the nature of learning. We need a learning teaching force. The current focus on the quality of teachers already in the profession necessitates an improvement of effectiveness through professional learning and the evaluation of practices (Hitt & Tucker, 2016). The most recent Organisation for Economic Cooperation and Development's Teaching and Learning International Survey (TALIS) report in 2018 found that 90% of teachers and principals attended at least one continuous professional activity per year (OECD, 2019). In Australia, due to the mandatory requirement for professional learning for teacher registration, this percentage climbs to 99% of practising teachers who participate in professional learning. Yet, anecdotally at least, 'many educators feel a sense of empty ritual in professional development

sessions, as well as a general apathy toward educational research' (Ferrero, 2005, p. 426).

This failure of staff development to fulfil its promise, Ferrero (2005, p. 420) claimed, can be attributed, in part, to the general tendency to underestimate the 'degree of organization, energy, skill, and endurance' needed to introduce new practices into classrooms and to sustain collegial relations among teachers. Thus, the focus for educational leadership should be on teacher and student learning, instruction and curriculum (Brooks & Normore, 2015).

Each year worldwide, billions of dollars are spent on professional development programmes. Although figures on actual spending for teacher development are difficult to locate one report commissioned by The New Teacher Project study three large districts in the United States and then extrapolated its findings across the 50 largest districts and concluded that resources allocated to professional development teacher improvement to cost a combined $8 billion in those districts alone, every year on teacher development for the years 2011–2012 (Jacob & McGovern, 2015). Teacher professional learning across the world is resource intensive. Yet despite the spending, these programmes are often, woefully inadequate, fragmented, intellectually superficial (Borko 2004) and often aren't effective in enabling change (Darling-Hammond, Hyler, & Gardner, 2017). They often ignore what is known about how teachers learn. In addition, professional development experiences generally fail to combine the teaching of the theoretical principles of learning with the practical classroom demonstrations that display implementation of high standards (Cannon, 2006).

The Australian media is highly critical of, and dissatisfied with, the nation's education system (Davis, Wilson, & Dalton, 2018). The education sector's remarkable vulnerability to public opinion and political pressure has placed criticism on teacher preparation and quality (Cohen & Mehta, 2017). Increasingly, the literature is reflecting the impact of globalisation and the focus on national student test scores as competition dominates. The policy desire to lift student learning outcomes has created a demand for leaders who can achieve this improvement (Gumus, Bellibas, Esen, & Gumus, 2018).

Thus, much of the discourse regarding lifting student performance argues for an improvement in teacher quality. The assumption that teachers are critical to lifting student achievement as measured by test scores (Cochran-Smith, 2016) is driving policy and, to some extent, educational research. The Programme for International Student Assessment (PISA) has resulted in 'proof' that the quality of education in Australia is below policymaker, as well as public, expectations and international best practice. The need for change and the drive for improvement are constants in both the educational research literature and the popular press (Baroutsis, & Lingard, 2017) . The imperative to be amongst the top-performing nations in this increasingly globalised environment, so that Australia's civil and economic wealth is guaranteed, is gaining ascendancy in thinking. Indeed, it is the PISA media discussion that is both integral and ever-present, continually focusing public, and quite often academic, discussion on education. Usually, the topic of teacher quality emerges as the cause of the malaise and teacher effectiveness is now at the top of the policy agenda (Darling-Hammond, Hyler, & Gardner, 2017). As accountability and systems have increased

the demand for real growth evidence of student learning, there is also a demand for increased teacher capacity building, which largely happens through professional learning. Excellence sits alongside equity in Australia's premier education policy—the *Melbourne Declaration of Educational Goals for Young Australians* (MCEETYA, 2008). The framing of the Melbourne Declaration resulted in the creation of the federally funded agency, the Australian Institute for Teaching and School Leadership, with a remit for developing a Principal Standard (AITSL, 2014), Teacher Standards (AITSL, 2011) and a Charter for Professional Learning (AITSL, 2012), all instruments for facilitating developing excellence.

Althauser (2015) contends that any professional learning intending to positively impact student achievement should 'focus on how to improve content and pedagogical knowledge, teach best practices, and redirect teachers' attitudes to students' learning requirements' (p. 210). 'We need to ensure that this greatest influence i.e. *the teacher*, is optimised to have powerful and sensationally positive effects on the learner' (Hattie, 2003, p. 3).

In Australia, much of the recent activity around improving teacher quality has focused on ITE and improving the quality of teachers entering the profession. ITE should be seen as 'providing the foundation for ongoing learning rather than producing ready-made professionals' (Schleicher, 2016, p. 42). This policy shift to teachers already in the profession has regulatory authorities requiring evidence of individual teacher professional learning for the continuing certification of teachers.

Thus, to deliver worthwhile outcomes in schools, the quality of teaching is now a key focal point in the profession and largely guides the Charter for Professional Learning, both organisationally and individually. The teaching challenges created by higher expectations for learning, as well as the greater diversity of learners (Darling-Hammond et al., 2017), mean that ever-increasing levels of expertise are required of teachers (and leaders) in areas of assessment, feedback and classroom management, which requires ongoing professional learning. Darling-Hammond, Wei, Altha, Richardson, and Orphanos (2009) emphasise that the quality of education provided to students is dependent on teachers continuously supplementing their own knowledge and skills. This is indeed a heavy responsibility placed on the teaching profession. The current focus on school reforms, that seems to centre on educating and developing teachers, necessitates the provision and accessibility of continuing, relevant and engaging professional learning for teachers. Yet, just how much change and renewal realistically can be expected of teachers and how can leadership best facilitate the professional learning needed to support change and renewal?

An understanding of some of the factors conducive to, or hindering, professional learning is needed if we are to provide principals with strategies to foster meaningful professional learning that is conducive to student learning improvements and ameliorate barriers to professional development. Policymakers emphasise that excellence in teaching and teacher education is a critical characteristic of modern education (De Wever, Vanderlinde, Tuytens, & Aelterman, 2016). Capacity building is one of three teacher level predictor variables in Mulford and Silins' (2011) model and the only one that impacts on all three student outcomes of academic achievement, social development and empowerment. The drive to improve learning in schools has

turned the lens on teacher quality, therefore, building teacher capacity is seen as non-negotiable. Schoolwide professional learning is one approach employed to improve teacher quality, yet as already stated the track record has been far from spectacular. Previous research has focused on understanding why professional learning is far from productive, with this chapter endeavouring to draw on the findings of research that has explored the contribution of leadership to effective teacher professional learning and to bring together strategies that school leaders can employ to gain from professional learning and better support teacher learning. The significance of this study is that it brings together the recommendations of recent scholarly endeavours to explore best practice leadership for ensuring meaningful teacher professional learning. It is hoped that the practice of school leaders can be supported by perusing the effective strategies referred to in this text.

The challenge for those in the profession, and those leading the profession, is to articulate what is excellence in teaching and how do we become excellent? Policy-makers, the media and the general population are all demanding excellent schools with excellent teachers. Society expects that leaders, in particular, should be across the evidence for improvement of student academic achievement (Zierer & Hattie, 2018).

10.2 Objectives of Study and Research Questions

This chapter accepts the premise that strong professional learning positively develops teachers' classroom practices that then translate into higher student achievement (Darling-Hammond et al., 2009). It contends that principals remain the central driving force in schools despite the emphasis now on distributed, shared and teacher leadership. It focuses on the role of school leadership for ensuring effective professional learning for teachers to increase teacher capacity. It explores the ability of leaders to foster continual, meaningful learning for all teachers to maximise teacher influence on student learning.

The aim of this chapter was to promote the strategies that leaders can employ in the provision of professional learning for teachers and to provide evidence-based suggestions for practising school leaders keen to ensure positive learning outcomes for their students. This chapter aimed to bring together the powerful nature of leadership and the positive potential of effective professional learning to influence the learning of students in our schools. It explored the literature on teacher professional learning and the role of leadership in promoting that learning. It synthesised what effective leaders do and how they do it. The intention was to focus predominantly on formal teaching professional learning within a school setting.

Few teachers expect to change their teaching practices as a result of participating either voluntarily or reluctantly in professional development (Timperley, 2011). Does the research literature on professional learning show that we have made any progress in the past few years? If education is to change, then transformation largely hinges on teachers changing their practice. If teachers are reportedly not engaging in change

(Twyford, Le Fevre, & Timperley 2017) and not really benefiting from professional learning, how can school leaders remedy the situation? While there may not yet be definitive frameworks for highly effective professional learning, this chapter concludes with the provision of possibilities for school principals to explore so that they maximise the teacher professional learning in their institutions.

The following research questions were examined in the present study:

Research Question 1: How can school leaders ensure that schools have a learning teaching force?

Research Question 2: What does contemporary research find to be the most effective strategies for change leaders to employ to support school-based teacher professional learning to maximise the impact on student learning outcomes?

10.3 Defining Teacher Professional Learning and Educational/School Leadership

The sense with which the term professional learning is used interchangeably with professional development is that of learning or developing knowledge, skills and understanding of teachers to enable enhanced teaching practice that will positively influence student learning. Professional learning is the professional acquisition of new knowledge, skills and understanding by teachers already in the profession to implement high-quality practices to improve student learning. The desired outcome for all students is at least one year's growth as a result of one year's instruction in a school, year on year. Darling-Hammond et al. (2017) defined all effective professional learning as structured learning changing teacher practices that lead to improved student outcomes. This professional learning has seven identifiable features. The learning is content focused, active, supports collaboration, provides models of effective practice, utilises coaching and expert support, offers feedback and reflection, and is of a sustained duration. Whatever the definition, it is desirous that the end goal of teacher professional learning be a measurable improvement in student learning.

The term school leadership as used in this chapter refers to the appointed school leader, usually referred to as the principal. Building on Hargreaves' (2010) notion of self-improving schools, in the context of this chapter the term school leader implies a school leader committed to improvement in the education of students and teachers in a school setting. While there is an increasing body of research that explains the influence of leadership, as well as strategies, to be enacted to attain an influence on student learning (Hitt & Tucker, 2016), the leadership strategy under consideration in this chapter is its influence on the professional learning of teachers. Although accepting that educational leadership is a broader concept, this chapter chose to focus on the person with formal authority—the school principal—and the direct activities of practices the principal may enact to maximise the effectiveness of teacher professional learning.

10.4 Conceptual Framework

The intent of this chapter was to support school leaders to be effective leaders of teacher learning. The focus was to specifically explore the research literature on the influence of school leadership on teachers' professional learning; thus, it adopted a qualitative approach focusing on research content analysis and synthesis to explore and understand successful strategies for school leaders to ensure that professional learning can lead to improvement in teaching strategies and learning outcomes resulting in positive change. It follows the process of

- formulating the problem and consideration of the questions that directed the study
- deciding the focus search of peer-reviewed journals and reports from 2014 to 2019
- searching the literature
- analysing and synthesising the information gleaned from the literature
- evaluating the research findings of previous research projects
- presenting an overview of the results (Cooper, Hedges, & Valentine, 2019).

This qualitative approach and an examination of the data allowed for questions to emerge through an inductive analysis of contemporary research literature. A thorough search of recent research began by accessing general databases including Google Scholar and ProQuest, and then progressed to more specific academic databases including ERIC to access recently published and relevant literature. This resulted in 64 articles being reviewed. The selection was confined to peer-reviewed journal articles and major international reports, specifically the OECD's TALIS reports of 20,164 (OECD 2014, 2019). Books and book chapters were excluded. Papers on educational leadership with a focus on broader leadership such as middle leadership, executive team leadership, system leadership and teacher leadership were excluded, as was literature not focused on teacher professional learning to improve student academic outcomes. It is acknowledged that teachers access a range of learning that is not all focused on student learning to assist with the roles that teachers have in schools.

To a large extent, the search was self-selecting as the emphasis was on recently published, peer-reviewed articles on teacher professional learning that also included references to the contribution of leadership to teacher professional learning, or articles on educational leadership focused on school leadership incorporating school professional learning. The selection was further narrowed by choosing only studies that focused on school leaders within school settings and the direct connection with student academic outcomes. A mixture of quantitative and qualitative studies, including studies of teacher attitudes towards professional learning, examination of principals to teacher improvement as well as previous systematic reviews of professional learning research, was drawn upon based on the relevance and strength of the findings and recommendations.

The review of the available literature was contextualised and references some seminal studies from an early period in the twenty-first century. While much of the

current literature on professional learning focuses on professional learning communities and networked approaches to professional learning, this chapter limited its focus to individual teacher professional learning within the school context. The survey and consequent filtering of the literature were to identify approaches to professional learning at an individual teacher and school level to identify possible suitable approaches to teacher professional learning that could be adopted by school principals. All studies and articles had to make an explicit connection between the two concepts of school leadership and in-service teacher professional learning. There is a growing interest in research on leadership (Gumus et al., 2018), hence the concentration on the literature of mainly the past 5–6 years.

Full, careful reading and analysis of the selected articles to elicit evidence-based strategies, practices and approaches to be consolidated resulted in the recommendations in this chapter. This literature review approach brought together the findings and conclusions and these were analysed and synthesised to provide evidence of effective leadership practices that positively contribute to teacher and student learning. The evidence provided a range of practical strategies to enable principals to capitalise on the professional learning undertaken by their teaching staff to maximise student learning and enact continuous school improvement. The concentration was specifically on what does make a difference to suggest the most influential pathway for school leaders to influence the learning in their schools.

10.5 Discussion

Educational leadership has long been a recognised genre and the scholarship is voluminous in output. The literature consistently focused on the role of leadership in educational improvement at a school and system level. Yet the field is not without criticism. Brooks and Normore (2015) remarked that 'put simply, many studies ostensibly focused on educational leadership are indeed not studies of educational leadership at all. As a field the scholarship is tended to be very strong on leadership and very weak on education' (p. 802).

It could be the case that marked improvement in education and assistance level may require an emphasis on between school rather than in-school improvement (Prenger, Poortman, & Handelzalts, 2017). Darling-Hammond et al. (2017) remarked that the conceptualisation of ongoing professional learning that is part of a collective effort, rather than an individual undertaking, was the 'next emerging horizon for teacher learning' (p. 304). However, this chapter maintained a focus on the within-school professional learning and performance enhancement. While recognising that much teacher learning is informal (Kyndt, Gijbels, Grosemans, & Donche, 2016), the focus also remained on more formal forms of professional development, which is organised, time-bound professional development usually at the school level.

There are significant gaps in the literature. In searching for interrelated themes emerging from the discussion and recommendations of this review of the largely recent literature, it was evident that there was still work required to investigate the

role of principal leadership in promoting and advancing effective teacher professional learning. Much of the recent scholarly endeavour in this area has looked at the potential of networked leadership, networked professional learning and increasingly the role of system leaders. This reflects the contemporary emphasis on achieving large-scale improvement across jurisdictions and nations. Thus, a gap in exploring what is currently happening at the individual school level becoming evident.

Nevertheless, the discussion that follows presents the ways in which principals can enhance student learning outcomes through their leadership of teacher professional learning. It considers the practise of instructional and transformative leadership, ensuring positive teacher perception of leadership for learning, creating a learning culture and promoting professional learning communities within the school. Principals leading the school's professional learning agenda, connecting professional evaluation with professional learning, dismantling barriers to effective professional learning providing research-informed school-based professional learning and encouraging reflective practices and action research are also considered.

10.5.1 Leadership Impacting Student Learning Through Teacher Professional Learning

Since the 2008 study by Robinson, Lloyd and Rowe, the role of leadership and the potential influence of leadership on student outcomes has become the baseline for consideration of the contribution of leadership to school improvement. Much effort is being made in the realm of educational leadership, to identify exactly what are the effective leadership characteristics required to meet the complex needs of a rapidly changing world (Sun, Chen, & Zhang, 2017). Professional learning can be judged effective if it improves teaching (Jensen, Sonnemann, Roberts-Hull, & Hunter, 2016). If school leadership plays such a strong contributing role towards improving teaching and continuous professional learning has the potential to increase student performance, then bringing these two contributing factors together should multiply the benefits. While it is common practice to allocate the lion's share of resources for teacher professional learning at the pre-service education level, lifelong learning is the key in this rapidly changing world (Schleicher, 2016).

The diversity of the contemporary student population, rapid advances in the use of technology, and the complexities of teaching to visible, public professional standards, as well as increased levels of accountability, demands the need for, indeed the mandated requirement for, teachers to engage in ongoing professional learning. Yet this begs the question as to whose responsibility is it to ensure the teaching staff and individual schools use professional learning to inform improved teaching practices to ensure continuous improvement of student learning? While there is professional responsibility on the part of the individual teacher, the collective needs of an institution would suggest that a fair degree of responsibility lies with individual school leadership. Given the advances in research in both educational leadership and the

potential of teacher professional learning to influence improved teaching strategies, contemporary research, while limited, supports the notion that the principal has a major role to play in enhancing the benefits of targeted in-school professional learning.

The school leader is the champion of the profession at the individual school level. The current tendency to assume that if schooling is not delivering the outcomes deemed optimal by the policymakers then the teachers are the problem creates an atmosphere of despondency within the profession. Shifting the focus from teachers being the problem to teachers holding the solution may make a difference. The school leader can lead teacher learning by allowing teachers to explore new ways of meeting the everyday challenges of their individual classrooms so that a measurable difference to student learning is more likely (Timperley, 2015). However, the principal cannot simply provide the opportunities but must actively participate in continuous professional learning at the school level. While media and policy focus echoes 'teacher quality', energies should be directed towards leaders and their role in ensuring quality through the provision of outstanding professional learning.

Leadership has the potential to improve teaching and learning through setting objectives and influencing classroom practice (Hopkins, 2015). Hitt and Tucker's (2016) thorough synthesis identified in their systematic review of key leader practices influencing student achievement provides a summary of what empirical research has reported are effective leadership practices. These include what they refer to as five domains of

a. establishing conveying the vision
b. facilitating high-quality student learning experiences
c. building professional capacity
d. creating a supportive organisation for learning
e. connecting with external partners (p. 542).

This chapter concentrates on domains c and d. While there may not yet be definitive frameworks for highly effective professional learning, Hitt and Tucker's (2016) analysis of the capacity of the three frameworks they studied, the Ontario leadership framework, the learning-centred leadership framework and the essential supports framework indicate that all three emphasise providing opportunities to learn for principal and teachers, creating communities of practice, and ensuring a responsibility for learning as contributing to positive transformation.

Hopkins' (2015, p. 17) framework provides further direction and suggests that principals can lead by

- Establishing structures for scaffolding teacher development
- Making peer coaching ubiquitous
- Creating protocols for both teaching and learning
- Incentivising teacher teams
- Ensuring that observations are non-judgemental.

The most common form of leadership researched since 2005 has been distributed/collaborative and teacher leadership; however, the focus has remained on

the principal to support distributed leadership collaborative leadership and teacher leadership (Gumus et al., 2018). The focus is on how to improve teacher professional learning, as much of the research on educational leadership models has emerged since 1980.

The underlying assumption is that effective professional learning will result in more effective teaching, and thus more effective learning. Past research has concentrated on exactly what is effective professional learning (Guskey, 2000) and how teachers best learn (Putnam & Borko, 1997; Putnam & Borko, 2000) and under what conditions (Cordingley, 2015). Often, the purpose of professional learning is to have teachers implement 'someone else's great ideas, preferably with high levels of fidelity' (Timperley, 2015, p. 6). Opfer and Pedder (2011) concluded that the influence of professional learning was often lessened because schools generally did not adopt a coherent, well-coordinated approach to learning. These problems must be addressed by the school leader so that professional learning for teachers is cumulative and widespread, and measurably influences student learning progress.

Timperley (2015) presents a challenge for leaders to create the conditions for learning to empower teachers so that they have a strong sense of responsibility for their own and whole school learning. The AITSL's (2011) *APSP* advises that principals should place learning at the centre of strategic planning and refers to the 'learning leader' as one who, amongst other attributes, establishes, '…an environment that provides opportunities for all staff to learn and improve together' (p. 8).

This chapter contends that learning leaders need to do much more than establish an environment and provide opportunities. Wilkinson and Kemmis' (2015) case study of leadership as leading confirmed the positivity of adopting an enquiry approach to learning, which was modelled in subsequent professional learning opportunities. Leveraging research as professional learning is one way that forward-thinking principals who are focused on leading educational change can be proactive. Promoting a culture of enquiry and learning, or what Leithwood et al. (2019) identified as stimulating growth in the professional capacities of staff, along with building trusting relationships and providing instructional support is a good beginning. Defining school leadership as leadership for powerful learning reminds us that the challenge for principals is to keep the focus on learning and not to be distracted by competing demands. The markers for experienced teachers' professional development must coincide with the markers for continuous whole school improvement. Hopkins (2015) claimed that the 'overwhelming importance of leadership in the pursuit of realising our collective moral purpose—the enhancement of student leadership and potential' is non-negotiable (p. 19).

Two leadership models frequently referred to in educational leadership research that has the potential to improve teacher learning are transformational leadership and instructional leadership.

10.5.2 Principals can be Transformational Leaders

Leithwood, Harris, and Hopkins (2008) confirmed that leaders do influence teachers' willingness to learn to improve. This is most apparent in transformational leadership, which appears to influence the motivation of teachers to learn and potentially change their practice. However, there are too few studies available to be confident that this form of leadership is the correct approach (Eliophotou-Menon & Ioannow, 2016). There is growing evidence of the power of transformational educational leadership in many nations (Sun & Leithwood, 2015; Sun et al., 2017). One aspect of transformational leadership is creating trust. Trust is related to the level of teacher engagement in professional learning based on Timperley's (2011) work. Learning from others and exposing current teaching practices to colleagues and leaders is possible if a relationship of trust mitigates the risk. Replacing what many feel are tried and tested practices with untried, yet potentially beneficial, teaching strategies, requires trust and permission to risk failure. Acknowledging that collaborative school-based learning requires trust between the leader and teachers as well as among others this trust is security teachers perceive agency by principles involving teachers in the decision-making and then active participation in the learning. Trust in leadership is essential. Equally essential is the role of the principal in maintaining a strong culture of expectation and support for the development of teacher capacity building with a specific focus on the use of student learning data to drive teacher decision-making that can enhance teacher quality and student learning (Johnston & George, 2018, p. 697). Twyford et al.'s (2016) case study research of 21 teachers across three schools found only three teachers experienced little or no perceptions of risk and vulnerability in their professional learning and developmental experience. While this was only a small study, a replication of this would most likely result in similar findings. Furthermore, these authors reported that the risk and vulnerability influenced the teacher's capacity to learn. Thus, how can school leaders reduce risk anxiety and create an environment where teachers learn why and how to change teaching practices in line with the transformational needs of the school? One way is for school leaders to ask the 'how we are travelling' and 'where to next' questions in a non-blaming way, which grants permission to teachers to learn what is needed for progress (Timperley, 2015). Another way is by learning with teachers, which provides principals with the information into what is needed to support teachers during the implementation of new practices (Hallinger et al., 2017).

Through building and sharing a sense of purpose, encouraging greater effort and inspiring higher values, progress is possible (Sun et al., 2017). A transformational leader who listens and understands the values and goals of an individual teacher and provides timely and positive feedback can potentially meet the learning needs of students by meeting the learning needs of teachers (Sun et al., 2017). Leithwood and Sun's (2018) quantitative exploration confirmed that transformational leadership practices where the leader was open, amendable, supportive, established high expectations, and was aware of the bureaucratic demands placed on the teaching staff were to be encouraged. These transformational characteristics when combined

with instructional leadership practices that encourage teachers to focus on optimising instructional time, promoting a culture centred on academic excellence, and where teachers are encouraged and supported to improve the classroom instruction have a relatively direct influence on lifting outcomes. It is this simultaneous integration of instructional and transformational leadership that has the greatest potential for leaders to increase their indirect impact on student learning (Leithwood & Sun, 2018). Supportive leadership is integral to school reform and the capacity building of teachers. Transformational and instructional leadership dominates the leadership literature, although increasingly the focus in leadership is broader than the principal (Robinson, Lloyd, & Rowe, 2008).

10.5.3 Principals can be Instructional Leaders

Instructional leadership is also a very popular area of study (Gumus et al., 2018). The concept of instructional leadership, or as Bush and Glover (2014) prefer 'leadership for learning', which emphasises learning rather than instruction, has gained traction in the past decade (Gumus et al., 2018). The essential focus of instructional leadership is learning, pedagogy and instruction. Instructional leaders demonstrate best practice instruction and the professional conversations leaders have with teachers are concerned with teaching and learning. Thus, instructional leaders are those who spend a sizeable proportion of their time improving the instructional quality of teachers in this form of leadership. The demand-enhanced student assessment practice, special needs pedagogy, cross-curricular activities and student classroom management are all increasing areas of need for teachers as the complexity of the classroom multiplies (OECD, 2019). This form of leadership hinges on the notion of leaders influencing student learning through their capacity to influence teachers (Bush & Glover, 2014). Instructional leadership is the obvious form of school leadership that is most likely to ensure the establishment, development and flourishing of a school's professional learning platform. Instructional leadership has the potential to transform the business of schooling, that is, teaching and learning. However, as Vanblaere and Devos (2016) reported, the teachers they studied identified their leaders as transformational leaders and only instructional from time to time.

Time spent on curriculum and teaching-related tasks such as developing curriculum, physically teaching, observing teaching, mentoring teachers, designing and organising professional development, and student evaluation are key aspects of instructional leadership that, on average, occupy only 16% of a principal's time. Yet 70% of current principals reported attending training to become instructional and pedagogical leaders with a particular interest in improving teacher collaboration (OECD, 2019).

To some extent, it is the role of an instructional leader to share their enhanced instructional knowledge and skills with teachers, instructing teachers who then instruct students, and thus potentially transforming learning and teaching. The

accepted wisdom based on Robinson et al.'s (2008) meta-analysis is that principals can influence student learning in their capacity as instructional leaders. One aspect of this form of leadership is teacher development.

Acknowledging that the current thinking around instructional leadership is a more distributed model (Gumus et al., 2018), the role of the principal remains pivotal. Indeed, it is a principal who participates as a learner, who is actively engaged in teacher learning as well as individual learning, who then gains the trust of his or her teachers, further increasing the impact of leadership on learning. In the best evidence synthesis work by Robinson and her colleagues (2008) that distilled the five leading attributes of an effective leader as being:

- setting goals and expectations,
- resourcing strategically,
- ensuring quality teaching,
- leading teacher learning and development, and
- ensuring an orderly and safe environment,

it was the fourth domain of leading teacher learning and development that had the highest effect size on student achievement, which had twice the impact of the other four domains.

Hallinger, Liu, and Piyaman (2019) defined learning-centred leadership as 'a process whereby school leaders motivate, guide and support teacher learning and school improvement' via a four-dimensional approach to leadership comprising building a learning vision and articulating the purpose of teacher learning; motivating teachers by providing inspiration, encouragement, trust, care and respect and providing learning support, managing the learning programme, and modelling.

There is limited literature that explores the possibilities for transformational and instructional leadership to improve student learning. Combining both transformational and instructional leadership strategies appears to hold promise (Day, Gu, & Sammons, 2016). Leadership does matter. It is the visionary and inspirational aspects of transformational leadership, where leaders build structures and cultures, develop people, plan the curriculum and evaluate teaching and teachers to impact positively on student learning when combined with the instructional leadership elements of raising teaching performance expectations of self and students, improving conditions for teaching and learning and using data and research that has the greatest potential for transformation and impact on student learning (Day et al., 2016). Yet Schleicher (2016) is forthright when he states that 'school leaders should be encouraged to focus on instructional leadership' (p. 47).

Instructional leadership, however, is not without its challenges. One of the identified challenges is in a secondary setting where instructional leadership with a content focus becomes more problematic. As principals cannot be expected to possess all content knowledge, some suggest they employ transformational leadership strategies by encouraging and supporting teacher-led professional learning where teachers in a secondary context are provided professional learning by subject department content experts (Valckx, Devos, & Vanderlinde, 2018). The immediate potential of instructional leadership to directly influence teacher performance as it focuses on the

instruction, curriculum and student performance would appear obvious but there is little contemporary research into this potential.

Instructional leadership is sometimes now seen as 'shared instructional leadership', where the principal interacts and collaborates with others to improve the school's instructional programme (Hitt & Tucker, 2016). In this role, the leader is more of a 'facilitator of continual teacher growth' (Hitt & Tucker, 2016, p. 534). This chapter strongly argues in agreement with Hitt and Tucker (2016) whereby extending principal expertise and understanding of curriculum, pedagogy, and assessment, and modelling high levels of curriculum, pedagogical and assessment knowledge, skills, and understanding is more likely to garner a positive response for improving the instructional programme and the quality of teaching because of increased levels of perceived credibility. Principals focusing on instructional leadership, developing themselves so they become expert instructional leaders, even adopting the role of mentor (Althauser, 2015) and then sharing leadership responsibilities for other facets of school management (Kraft & Gilmour, 2016) is one way of strengthening competence. Teachers are then more likely to be willing to learn and work towards improvement.

School leaders should be instructional leaders, which means being involved with teachers and teaching (Vanblaere & Devos, 2016). School leaders should actively promote a schoolwide culture with a focus on learning and high achievement (Kraft & Gilmour, 2015). These knowledgeable leaders can provide suggestions and guidance as instructional leaders, and thus support and encourage teachers in transformational practices. Hallinger (1992) claimed that few principals had 'the instructional leadership capacities needed for meaningful school improvement' (p. 38). The need is for a reorientation of the principal's role that requires training and socialisation experiences to help principals and thus develop the necessary knowledge and skills relevant to the role as a learning leader (Hallinger et al., 2017). Yet, school leaders can work towards the acquisition of pedagogical knowledge, skills, and understanding, and thus position themselves as role models of best classroom practice. They can ensure that instructional leadership is the strongest element of their personal leadership practice. As Althauser (2015) outlined, 'professional development designed to create positive change with student achievement needs to focus on how to improve content and pedagogical knowledge, teach best practices, and redirect teachers' attitudes to students' learning requirements' (p. 210) Transformational, instructional leaders who also practise relational leadership are most likely to maximise the professional improvement of teaching staff and transform their schools. When teachers are supported in and recognised for their efforts, then they are more likely to support endeavours to improve.

10.5.4 Principals can Ensure Positive Teacher Perception of Leadership for Learning

Vanblaere and Devos (2016) explored the perception of leadership by teachers in relation to professional learning communities with teachers in 48 primary schools. Professional learning communities appeared to hold promise for teacher learning. What these authors found was that leaders who exhibited instructional leadership behaviours and when his or her own focus was specifically on instruction encouraged their teachers to likewise focus on instruction. This perception of instructional leaders being in charge of instruction is powerful as it confirms that these leaders model behaviours that are conducive to instructional improvement and that they are publicly demonstrating what they value as a school leader.

Leadership in high-performing schools as reported by teachers is more focused on teaching and learning and is seen to be an instructional resource for teachers, and leaders are more active participants in, and leaders of, teacher learning and development (Robinson et al., 2008). The presence of instructionally focused leadership influences the effectiveness of professional learning (Schleicher, 2016). The more that teachers note that the principal is fully participating in active teacher learning and development, the higher the student outcomes' (Robinson et al., 2008). Little wonder then that the leadership dimension that is most strongly associated with positive student outcomes is the one that has leaders promoting as well as participating in teacher learning and development (Robinson et al., 2008).

To be successful, leaders can focus on developing their personal leadership capacity in motivating and coaching teachers who create opportunities for instructional and content coaching (Kraft & Gilmour, 2016; Valckx et al., 2018). While there is an expectation on school leadership to stimulate professional learning, there is little research exploring the potential of leaders to achieve more if they lead and actively participate in the learning and then follow-up this learning.

Acknowledging the limitations of teachers' perceptions of instructional leadership, leaders whose behaviours are both demonstrative of instructional leadership and transformational leadership are inspirational in affecting change in teacher practices and beliefs (Vanblaere & Devos, 2016). Ross and Cozzens' (2016) study of 375 teachers in Tennessee, USA found that teacher perception of leadership qualities deemed to be successful in promoting better teaching and learning were ones where successful leaders exhibited high-level capacity in professionalism, curriculum, instruction, respect for diversity, collaboration and assessment.

Hallinger et al.' s (2017) study focusing on teacher professional learning in China and Thailand provides a refreshingly non-Western perspective on this topic as does Zheng et al's (2017) study on the impact of principal leadership on student outcomes in China. The claim that improvement needs school leadership as the driver for change (Bryk, 2010) holds as true in non-Western settings as it does in Western settings. Leaders should be highly visible, especially with their own and the school's professional learning. Other people notice their actions and the fact that these actions reflect what they expected their teachers then change is more likely (Hitt & Tucker,

2016). Leaders need to develop their own curriculum, pedagogical and assessment knowledge as well as develop that knowledge in those they lead. This not only furthers their reputation as an instructional leader but it also 'better equips the principal to be a source of knowledge and assistance' (Hitt & Tucker, 2016, p. 548). This modelling behaviour emphasises the centrality of learning, including teacher learning. School leaders' visible participation in strategically aligned professional learning demonstrates to all teachers what is a priority for the school (Valckx et al., 2018) and has a high impact. Furthermore, the trust engendered by this visible participation is invaluable.

10.5.5 Principals can Create a Learning Culture and Promote Professional Learning Communities Within the School

Leading change by garnering a collaborative, team oriented, whole of school approach focused on working towards excellence provides principals with the opportunity of furthering their indirect influence on student learning (Hitt & Tucker, 2016). The concept of site-specific professional learning communities was a major step forward in a renewed focus on the influence of professional learning and its role in assisting teachers to promote increased student learning outcomes. There has been much exploration of the role of these professional learning communities and their potential to improve the quality of classroom practice (Dufour & Eaker, 2009). The literature is replete with ideas on how to establish and run effective professional learning communities. It is an expectation that professional learning communities exist in schools (Vanblaere & Devos, 2016). The efficacy of these communities is enhanced by effective leadership.

Purposely developing communities of practice for adult learning as well as creating regular job-embedded learning opportunities encouraging and expecting professional dialogue and examination of student work is the role of leaders (Hitt & Tucker, 2016). Owen (2016) maintained that leadership support together with distributed leadership and a focus on teacher improvement were the crucial elements for high functioning professional learning communities. Future research could focus on the role of a school leader with the professional learning community model of professional learning. The creation and maintenance of a positive whole of school culture require principals to set high-performance standards for teachers as well as providing them with the necessary structure and support for collaborative capacity building (Johnston & George, 2018).

The potential of school leadership to foster a culture of collaboration, which seems to be a factor conducive to teacher learning, motivating teachers to work interdependently rather than dependently, is worth consideration (Tam, 2015a, b). Teacher collaborative approaches expand the potential of professional learning to improve teacher practices (Lynch, Madden, & Knight, 2014). Although suggested

in the context of networks, Munby and Fullan's (2016) directive that we move from collaboration to co-responsibility to a position of shared professional accountability appears to be sound advice. Stoll, Bolam, McMahon, Wallace, and Thomas (2006) acknowledged that principals can create a learning culture and establish the optimal conditions for learning; however, they cannot guarantee that a school's professional learning programme will flourish. This statement needs challenging. It is the role of the school leader to ensure that a professional learning programme will flourish. Just how can a school leader convince all teachers, not just those who are highly motivated, to fully engage in professional learning that meets the practice needs of the individual teacher and the improvement goals of the whole school? It is the principal who provides the strategic alignment between the needs of the teacher and the school and articulates both. When teachers perceive the clarity of purpose among professional development, individual practice improvement, student practice and whole school improvement, progress is more likely (Schleicher, 2016).

Teachers are intrinsically motivated to participate in learning to better cater to students (OECD, 2019). This learning can range from highly structured right through to informal including peer collaboration as well as professional reading. Principals can create an environment where, as Kools & Stoll (2016) note

- Teachers want and dare to experiment and innovate in their practice
- The school supports and recognises staff for taking initiative and risks
- Staff engage in forms of inquiry to investigate and extend their practice
- Inquiry is used to establish and maintain a rhythm of learning, change and innovation
- Staff have open minds towards doing things differently
- Problems and mistakes are seen as opportunities for learning
- Students are actively engaged in inquiry (p. 45).

Creating a learning culture begins with high expectations of teacher learning and subsequent teacher performance. Principals follow this up by creating and stimulating opportunities for high-level teacher debate, and an expectation of and resources for collegial learning, all of which can change teacher beliefs and thus classroom practices (Owen, 2016).

This learning culture can be supported by ensuring that professional learning is grounded in the day-to-day teaching practices, it occurs regularly, and takes place within the school environment (Lynch et al., 2014). Providing opportunities for, and encouragement of, active learning and collaborative learning with teachers who are co-constructors of their own learning is powerful professional learning. The identification of teacher needs is also paramount in terms of subject knowledge, pedagogical knowledge and competencies in teaching (OECD, 2019).

Professional learning cultures that are supported and sustained by pedagogical leadership of principals who themselves have learned how to create, lead and sustain the learning culture foster effective teacher professional development that has an impact on the instructional practices of teachers. By identifying the patterns of professional learning that are conducive to the establishment of professional learning communities, thus increasing professional conversations, collaboration and

collegiality, principals can strategically position the school's professional learning programme to meet the changing needs of the individual school.

10.5.6 Principals can Connect Professional Evaluation and Professional Learning

The notion that teacher learning needs can be identified through appraisal and evaluation is not new (Kraft, & Gilmour, 2016). Indeed, there are consistent calls for strengthening the links between teacher appraisal and professional development (Schleicher, 2016). Leaders can assist individual teachers via an alignment of teacher appraisal and professional learning. Principal directed evaluation can be successful if the focus remains on areas for improvement (Kraft & Gilmour, 2016). Principals can actively and regularly evaluate the teachers functioning at schools with an emphasis on performance appraisal whose intention is developmental as it seems to be the most effective in influencing improvement of classroom teacher quality (Valckx et al., 2018).

Using evaluation to determine individual, or even whole of school, professional learning needs can be challenging for principals. The most obvious challenge is the time commitment owing to the competing demands of all aspects of school leadership. The principal taking primary responsibility for the evaluation of teachers results in less frequent observation and feedback. Another challenge, especially in a secondary setting, is that the principal's field of expertise may not coincide with the teacher's expertise. Providing feedback outside the principal's area of expertise is challenging but expert feedback can focus on broader pedagogy rather than specific. Nevertheless, this lack of perceived expertise can damage principal reputation, trust and respect.

School leaders are encouraged to prioritise those areas where teachers feel they need the most support. School leaders can provide opportunities to focus on areas to meet the learning needs of students in today's world. Principals can provide training opportunities for teachers that build confidence in their capacity and they can assist teachers to participate in the most pertinent training for them.

The research confirms the impact of school leaders in their own schools (Leithwood et al., 2008; Robinson et al., 2008). Yet there is still much work to be done to align individual teacher professional progress with ongoing school improvement. Greater alignment of teacher performance and development may be occurring but, again, this is often at the individual teacher level. By creating opportunities and mechanisms for teachers to share their professional learning goals and outcomes, school leaders can foster collaboration and collegiality as well as achieve the strategic outcomes required for school improvement. Skilled school leaders who foster collegiality and improvement within schools and who purposefully articulate a clear link

with teacher evaluation as well as recognising and rewarding teachers who are innovative, share their learning and work towards helping achieve school improvement goals make a difference (Schleicher, 2016).

Professional learning that is ongoing, collaborative, and collective, and is aligned with the school's commitment to continuous whole school improvement, offers great promise (Johnston & George, 2018). Setting an expectation of performance development by both students and teachers, supplemented with support is likewise conducive to change and school improvement (Johnston & George, 2018).

10.5.7 Principals can Dismantle the Barriers to Effective Professional Learning

The benefits for teachers of effective, continuous professional learning include

- increased content and pedagogical knowledge and skills
- increased willingness to innovate
- increased commitment to continual learning
- increased confidence and application of research to practice (Cordingley, 2015).

Yet effective professional learning is frequently thwarted by barriers. The attitudes of teachers towards professional learning and their associated behaviours are often seen as a barrier to effective professional learning in schools. A lack of trust is a major barrier. The role of leadership in focusing teacher learning on student learning is only one dimension of leadership impact. Teachers' sense of trust can be enhanced by a transformational leader who demonstrates appreciation (Valckx et al., 2018). Even highly engaged, self-motivated teachers may find their individual learning hindered by a lack of support, encouragement and access determined at the school level. Trust colours the willingness of teachers to improve (Hitt & Tucker, 2016). This is a situation well within the power of a principal to rectify (Opfer & Pedder, 2011).

Conditions for teaching and learning within schools as well as a broader system can influence the effectiveness of teacher professional learning (Darling-Hammond et al., 2017). There are many barriers to effective school professional learning including inadequate resources such as teaching and curriculum resources, as well as ever-increasing demands on teacher time, the lack of a shared vision as to what constitutes high-quality instruction, competing requirements and poor foundational knowledge on the part of teachers (Darling-Hammond et al., 2017).

School leaders can provide the necessary resourcing and time. There needs to be enough time for learning as well as for application (Althauser, 2015). Conflict with the day-to-day work schedule and insufficient time are the greatest barriers to professional learning identified by teachers (OECD, 2019). Thus, allocating enough time within the normal work schedule and promoting this as an incentive for learning is crucial. Other barriers to professional learning identified by teachers is a lack of material incentive activities, with incentive reimbursement and potential salary

increases seen as incentives to overcome potential barriers. Teachers questioning whether professional learning is for career advancement or simply to fulfil the mandatory requirements of a system or is it really for learning and building capacity are often left unanswered. Many teachers claim that professional learning is too expensive, it lacks relevance, they have little time due to family commitments, they lack employer support or they are not ready for the level of professional learning are other barriers identified in the recent TALIS report (OECD, 2019). Thus, the principal's role is to identify the barriers and then provide support to overcome these barriers. This support can be both the allocation of time and resources and guidance as to the most suitable professional learning that aligns with the learning needs of the individual as well as the learning needs of the school.

Other substantial barriers include the fact that often time is not allocated to teaching curriculum that employs the new knowledge and skills, as well as the need to finish the mandated curriculum and, in many cases, the fact that teachers need to buy their own resources (Darling-Hammond et al., 2017). Although often embedded in policy, professional learning is frequently fragmented and limited in scope, thus clearly identifying a valid link to teaching profiles and standards may eliminate this barrier (Schleicher, 2016).

Owen's (2016) case study identified principal practices such as providing teachers with the time and funding to attend external conferences, co-locating physical office spaces, and thus promoting opportunities for professional dialogue, providing release time and funding for teams to visit other schools, as well as encouraging opportunities for distributed leadership within professional learning communities and ensuring a focus on professional conversations within professional learning communities as strategies to create effective teacher professional learning.

10.5.8 Principals can Provide Research-Informed School-Based Professional Learning

The professional development research literature indicates that school embedded professional learning is the preferred option (Lynch et al., 2014; Schleicher, 2016). There is a discernible impact if professional learning is school-based and links individual teacher development school improvement needs. If teachers can identify the direct link between professional learning in which they are engaged and improvements in their own practice, student progress, and whole of school improvement, then professional learning is likely to be seen as worthwhile (Schleicher, 2016). Activities that occur in schools and allow teachers to work in collaborative groups on problems of practice do change teachers' instructional practices for the better.

Encouraging schools to develop as learning organisations strengthens the connection between research and practice. Over and again, the research emphasises the school as a learning environment for teachers as well as students. Principals can encourage and provide the learning opportunities and mechanisms for teachers to

interact with their subject peers, within grade peers as well as across grade peers (Kraft & Gilmour, 2016). A key leadership practice should be the 'synthesising, identifying and then defining whole group development opportunities…' (Hitt & Tucker, 2016, p. 551). Professional learning that takes place in schools creates a culture of improvement and a shared vision of the learning for that school (Jensen et al., 2016).

If the endpoint of teacher professional learning is to influence student learning, why is that, as Timperley (2015) reports, external provisional learning courses attended by teachers have little direct influence on classroom practice and much school-based learning fares little better? Timperley argues that this is because teachers are presented with a school-based challenge that they then are expected to solve by learning how to do better.

Making the bold claim that high-performing systems understand and prioritise the evidence-based professional learning practices that lift teacher and student learning, Jensen et al. (2016) explored how to improve teacher professional learning. While high-performing systems are useful for providing insight, the responsibility of the individual school leader can be sometimes overlooked. In high-performing systems, such as Singapore, much of the professional learning is school-based, 'led by staff developers who identify teaching-based problems or introduce new practices in a teacher led culture of professional excellence' (Schleicher, 2016, p. 36).

Knowledge-based school leadership best practice (Schleicher, 2016) includes

- support for in-service professional learning
- in-kind support such as time, monetary and non-monetary support for participation in long-term professional development
- support for practitioner research
- participation in practitioner research
- development of a professional development plan
- participating in network supporting teacher professional learning.

School leaders purposefully selecting the professional and learning programme is one way of articulating what is important to meet the needs of an individual school at a particular point in time and in a particular context.

School leaders and indeed system leaders can peruse the recommendations to assist their endeavours to ensure that within-school professional learning is making a difference to the lives of young people in their schools. Teachers are not only supported in the work that they do in schools and in their professional learning but they are also inspired by the principal (Valckx et al., 2018).

There is potential for transformational leaders to enhance participation and cooperation by allocating dedicated within work time for teachers to meet, discuss and share. Professional learning should be job embedded with learning connected to daily teaching practices and not promoted as an additional task but clearly linked to the content and strategies necessary for doing a high-quality job (Althauser, 2015).

10.5.9 Principals can Lead the School's Professional Learning Agenda

School leaders can promote teacher leadership, shared leadership and distributed leadership for professional learning but importantly remain a major instigator of and contributor to the professional learning programme. Another focus to consider is the development of teacher leaders, particularly through a model of distributed instructional leadership or a hybrid distributed leadership approach that provides teachers with opportunities and enhances professional learning, but the primary driver remains the principal (Bush & Glover, 2014).

School leaders should be accountable for the quality of professional learning within their institutions. They can create a professional development programme that is purposefully aligned to the high expectations for the learning of both staff and students. In line with transformational leadership practice, professional learning is always connected to the whole of school vision articulated by the transformational leader and is also responsive to teacher and school needs.

Principals leading workshops; sharing knowledge gained through external conferences; and initiating, encouraging and modelling schoolwide professional conversations are other avenues of adding value to professional learning programs in schools. Principals can create opportunities for mentoring and peer coaching. They can create time for collective planning, discussion and reflective dialogue with an in-depth focus on teaching (Valckx et al., 2018, p. 49). They can provide teachers with levels of autonomy and an open culture to discuss ideas and decide what needs changing, while continually keeping to the shared vision articulated by their transformational leadership (Parise & Spillane, 2010). Teachers co-creating continuing professional learning in conjunction with principals is another effective practice.

10.5.10 Principals can Encourage Reflective Practices and Action Research

School leaders can demonstrate an explicit interest in and support for research (Cordingley, 2015). Providing opportunities for teachers to research, practice and reflect on a range of professional learning to enhance student achievement falls within the principal's purview. School leaders can promote the use of evidence-based continuing professional learning strategies and create opportunities for, and the expectation that, teachers to be actively engaged in research regarding content and learning as part of their day-to-day professional practice (Cordingley, 2015). Effective teacher engagement with research as professional learning can have flow-on benefits such as creating opportunities for coaching and mentoring. The role of the principal is to provide sustained support for professional learning to enable the embedding of new evidenced-based strategies, as well as supporting the form of time, access to

research, modelling research behaviours and engaging in enquiry-based approaches to growth (Cordingley, 2015).

To achieve strong academic goals, principals should be conducive to innovation, collaboration, reflection, diversity and professionalism (Ross & Cozzens, 2016, p. 171). By endeavouring not to split the 'sayings' from the 'doings' (Wilkinson & Kemmis, 2015) principals can journey alongside their teachers on the path to a self-improving school. Collaboratively focusing on teaching aligned with the notion of continuous school improvement and exercising flexibility to achieve this focus pays dividends (Johnston & George, 2018).

10.6 Conclusions

This chapter examined the more recent research and the contribution of school leadership to uncover strategies that school leaders could employ to foster and support more effective professional learning by teachers that has the potential to improve student learning. Improving teaching quality is increasingly seen as the key to student achievement (Schleicher, 2016). The boundaries of this chapter, with its focus on learning-centred leadership of professional learning, did not extend to exploring the direct linking of effective professional learning with student learning. It did not intend to delve into the role of the various theoretical approaches to leadership or what constitutes effective professional learning.

Through a content analysis of the findings and recommendations of the more recent research literature, this chapter synthesised conclusions to guide leaders to focus their professional learning efforts on improvement in the most effective ways. The provision of professional learning is often a high expense item in school budgets. Thus, the chapter purposely directed its attention to principal school leadership to provide principals ready access to evidence-based strategies that they can control and implement in their schools.

Bringing together what is known from recent strong research studies regarding effective leadership practices that are most likely to result in enhanced professional learning thus ensuring that excellence in curriculum, pedagogy and assessment translates into growth learning for all students, this chapter confirmed the crucial role that leadership plays in the school. The direct connection with teachers increases the indirect influence on student achievement. By maintaining a strong focus on curriculum, instruction and assessment, as well as devolving other organisational management features of school leadership, teacher effectiveness can be increased, and thus student outcomes are enhanced (Hitt & Tucker, 2016).

Professional learning leads to an openness to new ideas and practices as well as the initiatives to put them into practice and assess the results. Intentionally seeking to support school leaders to not only be leaders of student learning but of teacher learning, this chapter through an analysis of the results of recent research showed the contribution of the leader's role in effective teacher professional learning.

The purpose of this study was to provide effective strategies to assist those principals who wish to maximise the impact of their teachers' professional learning and change their leadership to do so. It is intended that leaders become aware of the potential influence they can have on the learning of teachers and hence students. It accepts Wilkinson and Kemmis' (2015) explanation that the very term leadership implies the notion of transformation and the premise that existing practices of leading can change.

Future research could investigate just how far educational leadership has moved and whether a claim can be made that the majority of principals now have the necessary instructional leadership capacities for meaningful school improvement. Scholarly research continues to provide recommendations to assist leaders to more effectively transform their institutions. An opportunity exists for research scholars to assist leaders to focus on the direct effects of principal leaders on the learning capacity of the teachers in schools. Hallinger et al. (2017) suggested that policymakers should consider a focus on leadership and that learning is fundamental core business, particularly in those societies that are unfamiliar with leadership being described and designated as such. This review of school-based leadership practices highlights those practices that can make significant, sometimes relatively direct, contributions to student learning.

Future research concentrating on detailed qualitative and quantitative research on leadership, teacher learning and transformative learning is required. The trend line based on PISA results shows a weak but discernible link between teacher professionalism and better student learning outcomes; however, quantitative research is needed in this area. Continuing research on the influence of school-based professional learning communities as well as the contemporary shift to between-schools networked professional learning are further areas for future consideration. An evaluation of the impact of the implementation of the strategies suggested in this chapter and the relationship to more productive teacher professional learning is another area for future study.

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