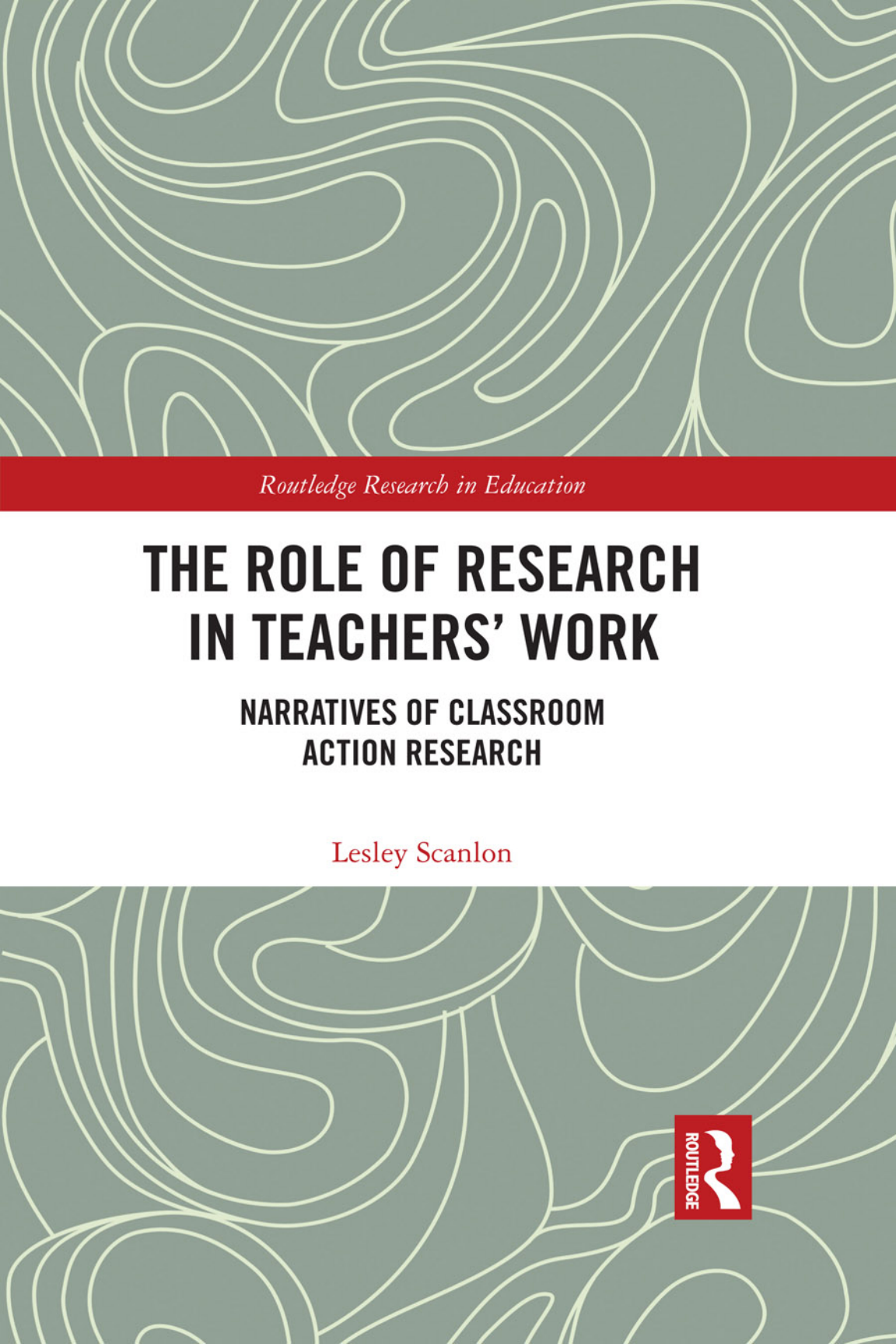
Routledge Research in Education
THE ROLE OF RESEARCH IN TEACHERS' WORK
NARRATIVES OF CLASSROOM ACTION RESEARCH
Lesley Scanlon
ROUTLEDGE

The Role of Research in Teachers' Work

In the debate regarding what constitutes teachers' work, academics and bureaucrats continue to speak for teachers, with teachers' voices rarely heard and not accorded equal recognition. *The Role of Research in Teachers' Work* addresses this imbalance by privileging teachers' voices as they narrate their experiences of engaging in systematic inquiry. The book embeds the teacher narratives within the scholarly debates about the nature of knowledge and the nature of professional practice.

Scanlon examines the knowledge teachers create through their research and how that knowledge is perceived by others within the school community. This book can be read as a companion volume to Scanlon's 2015 Routledge publication *My School*, or as a standalone exploration of teachers' own narratives of engaging in action research. Together, these two books are unique in contemporary writing on schools, representing one of the only comprehensive longitudinal studies of a low socioeconomic secondary school from the perspective of those who learn and teach therein.

This book enables teachers to be part of the scholarly conversation about their work and the place of research in that work. As such, it should be essential reading for academics, teacher educators and postgraduates in the field of education. It should also be of interest to policymakers and teachers.

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The Role of Research in Teachers' Work

Narratives of Classroom Action Research

Lesley Scanlon

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This book is dedicated to Josie, Gabriel, Ian and Michelene


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Introduction

Why this book, now?

The aim of this book is to explore the role of research in teachers' work through the action research narratives of a group of teachers from Grange High School, a low socioeconomic school in regional Australia. The extent to which research should be incorporated into constructs of teachers' work is an ongoing century-old, unresolved debate. The debate involves complex epistemological issues about the nature of knowledge, who produces it and where it is produced, and ontological issues of what constitutes professional identity. In this debate academics, researchers and bureaucrats continue to speak for teachers, with teachers' voices rarely heard and certainly not accorded equal recognition when they are. In this book it is teachers' voices that are privileged as they themselves tell us about their systematic classroom research; the process of becoming researchers; the establishment of collaborative relationships with their research partner; and the impact of research on their identity as teachers, on their students, on student outcomes, on their pedagogical practices and on their colleagues. In this way the book opens the work of the teacher-researchers at Grange to scrutiny by the research community and by so doing includes teachers in the scholarly conversations about not only their work but the place of research in that work.

The book is timely as recent comments by academics indicate the ongoing nature of the debates on the essence of teachers' work and the role of systematic inquiry in this work. The traditional construct of teachers' work as classroom-based, face-to-face teaching is still widely accepted and was acknowledged by Andreas Schleicher (Division Head of the OECD Programme for International Student Assessment) when he commented that Australian teachers are defined 'more or less' by the number of hours of face-to-face teaching that constitutes their work, adding: 'We treat teachers as interchangeable widgets on the frontline – they are just there to implement prefabricated knowledge' (Bagshaw 2016). In 2017 Schleicher again drew attention to the work of Australian teachers, noting that they teach a greater number of hours than their Asian counterparts and therefore have little time for reviewing and analysing lessons or for professional development (Munro 2017). Recent Australian research reported in the *Sydney Morning Herald* (Singhai 2017, p. 3) also noted that Australian teachers teach more hours than do teachers in Finland, where primary teachers teach 3794 hours per year compared with their Australian counterparts, who teach

6060 hours; the average number of direct face-to-face hours according to the OECD is 4553 hours. One impact of this, the research found, was that 30–50% of teachers 'quit in the first five years' because they do not have sufficient time for 'collaboration, mentoring and planning'. This trend is not limited to Australian schools – the United Kingdom and the United States face similar attrition rates.

The number of face-to-face teaching hours limits the time available to teachers for research activities; however, time is not the only constraint to the inclusion of research in teachers' work. There is, for example, resistance from professional researchers such as the Australian researcher John Hattie, who was reported in the *Times Educational Supplement* (Stewart 2015), as saying that research, the source of knowledge production, should be left to academics. Dylan Wiliam added to these comments, arguing that teaching as a 'research-based profession' was never going to happen (*Times Literary Supplement Opinion* 2015). In response to the comments of Hattie and Wiliam, the following was posted on the éduflâneuse.com blog: 'Is research in a real educational context by a real educator less valid than that of an academic from a university?' (Netolicky 2015). The various answers to this question are explored in detail in Chapters 1 and 2 through a review of the scholarly debates on the nature of knowledge and the essence of teachers' work.

The research context

The extent to which teachers are prepared to engage in research is dependent on context (Leat et al. 2015, p. 274) and here I explore both the national and local contexts in which the teacher-researchers at Grange High engaged in classroom inquiry.

The national policy context

The action research at Grange High was enfolded within the national political context of the Rudd/Gillard Labor governments (2007–2013). Labor campaigned and assumed office in 2007 with the mantra of the 'education revolution' and with *Quality education: the case for an education revolution in our schools* (Rudd and Gillard 2008) being the definitive document of Labor's education agenda. This document emphasised the social and economic role of education in national prosperity but at the same time emphasised the role education plays in empowering 'individuals to reach their full potential, and helps overcome disadvantage' (Rudd and Gillard 2008, p. 5). This latter claim caused Gannon (2013, p. 18) to assert that the document saw 'a return of equity discourses to the policy arena'. However, a close reading of the document indicates tension between the social justice agenda and the increase in accountability and audit, which prompted Lingard (2010) to comment that the 'education revolution' was merely injecting social justice into a neo-liberal agenda.

There were a number of arms to the 'education revolution' representing both the accountability and audit agenda and the social justice agenda of the

government. An example of the accountability and audit agenda was the introduction in May 2008 of the National Assessment Program – Literacy and Numeracy (NAPLAN) to test basic literacy and numeracy in Years 3, 5, 7 and 9. Intensifying this agenda was the 28 January 2010 launch of the My School website which provides statistical information, including NAPLAN results, for almost 10,000 schools across Australia. The social justice agenda was addressed through the 'building revolution' which saw school infrastructure improvements, and the 'digital revolution' where laptop computers were distributed to all Year 9 students. Of particular significance for Grange High, and other disadvantaged schools, were the *National Partnerships on Low SES School Communities* (2009) and the *Improving Literacy and Numeracy Project* (ILNP) (2013–2014). Disadvantaged schools were identified as those with below average NAPLAN results and these schools received substantial funds to improve teaching and learning through the implementation of approved initiatives focused on literacy, numeracy and teacher quality. Francis James, the principal of Grange High at the time of the action research initiative, explained his reaction to the 'education revolution'.

> We were running on the smell of an oily rag, there were never enough resources, never enough money. All of a sudden there's been a change and the Federal Labor government is spending money on education. I've never seen this in my career and I don't believe that teachers are going to see it again.
>
> (Scanlon 2015, p. 70)

It was largely through this national education agenda, and the principal's enactment of that agenda, that the action research initiative at Grange High was possible.

The local context

Grange township, a once prosperous working-class town reliant on employment in a local industry, is in regional New South Wales (NSW), Australia. The relocation of this industry some 40 years ago has over time resulted in a divided town. There are affluent areas populated by those employed in new service industries, with the much less affluent pockets of intergenerational unemployment and welfare dependency in the older areas of the town. At the time of the action research initiative Grange High, in the old industrial sector of the town, was a small high school educating some 450 students with 46 teaching staff and 10 administrative staff. A detailed study of Grange High appears in *My School: Listening to parents, teachers and students from a disadvantaged educational setting* (Scanlon 2015). In the newer, more affluent section of town young people attend Parkland Secondary, with a school population of over 1000 students. What distinguished Grange from many other low socioeconomic schools at this time was the low turn-over of staff. This was in contrast to Thomson's (2000) Australian research which found that disadvantaged schools generally have a higher staff turn-over than other schools, thus making

innovation and change difficult. Dinham and Sawyer (2004) similarly found that the stability afforded by a low staff turn-over provides the kind of constancy that supports change.

The principal

> Notwithstanding the importance of general factors in creating a supportive climate, it is hard to ignore the relevance of key individuals who are able to encourage and enthuse other members of staff in their institutions.
>
> (Leat et al. 2015, p. 278)

Schools are hierarchical institutions with ultimate decision making and responsibility resting with the principal. Ball et al. (2012, p. 45) suggest that principals occupy 'a sort of third space' between policy and practice where the principal interprets and enacts policy such that it is acceptable to not only the funding authority but to the school and to the community.

> I suppose the biggest challenge in a school like this is getting it right for this time and for this place, getting the structures in the school and the processes to support students and teachers.
>
> (Principal Francis James in Scanlon 2015, p. 70)

It is therefore the principal, through policy enactment, learning, teaching and administrative decisions who determines many of the day-to-day activities that constitute teachers' work. Ultimately therefore it is the principal who has the capacity to create a workplace context supportive of teachers' engagement in research.

Francis James' teaching and administrative career was spent in a number of regional, low socioeconomic schools throughout NSW and at the time of the action research initiative he had been principal at Grange High for 14 years. His interest in action research at this latter stage of his career is explained by his career-long emphasis on innovation and thinking 'outside the box' (Scanlon 2015, p. 57). An example of this was his appointment of a Leader of Digital Pedagogy and a Leader of Literacy and Numeracy Improvement to support pedagogical change. These appointments were, unusually for a high school, not situated within a specific faculty or to one classroom; rather the incumbents worked across faculties in what was a three-tier strategy. The first tier aimed to improve areas highlighted in the NAPLAN data; the second involved the Leader of Literacy and Numeracy Improvement working with small groups of teachers; and the third tier involved work with individual teachers. This programme of professional learning was intended to be self-sustaining with mentored teachers in turn mentoring others within their faculties.

Of the many initiatives at Grange High the most significant for this book is the action research project. In the 1950s Corey (Noffke 1992, p. 18) identified the workplace conditions conducive to action research. These included autonomy

over work and decision making, and enabling action researchers to feel safe and not alone in their efforts. Corey emphasised 'the need for personal relationships among those involved in the process, and the need for structural changes in the teacher's workplace'. He warned against simply adding action research to teachers' workloads and stressed the need for 'administrative support and restructuring'. These were the kinds of conditions the principal at Grange established to support teachers' engagement in action research. In a recent conversation Francis James reflected on the action research initiative, commenting: 'They were great times despite the limitations.'

The limitations at Grange included adherence to government and departmental policies, the contractual obligations of teachers, the willingness of teachers and indeed students to engage with action research, and of course time. To make action research more 'do-able' for teachers, the principal devised a collaborative action research model in which each teacher-researcher worked with a faculty colleague on a research issue of their choice. Moreover, the principal provided the teacher-researchers with release – on average five days over the 12 months of the projects – from face-to-face teaching to pursue their research. I was engaged as the university partner to tailor research training workshops to suit the individual needs of the teachers within the local school and policy context.

In selecting possible teachers for the project Francis consulted faculty head teachers prior to his approaching potential teacher-researchers. The candidates were identified as those currently committed to ongoing professional learning and who were deemed most likely to accept the action research challenge. Peters reports (2004, p. 548) a similar rationale employed by one of the principals in her research. It might be argued that targeting specific teachers was a kind of forced collaboration; however, as Carr and Kemmis (1986, p. 200) observe, 'people involved in education do not "naturally" form action research groups for the organization of their own enlightenment'. Johnston (1994, p. 39) similarly observes that 'teachers rarely (if ever) seem to undertake action research of their own accord'. Action research in schools requires a catalyst and at Grange this was the principal, who was, in effect, changing the construct of teachers' work by adding a research component to that work and by establishing a work context more conducive to research.

The teachers

How do teachers construct their work? The traditional construct of teachers' work defined as the classroom conveyance of other people's knowledge is pursued in detail in Chapter 2; here, however, I briefly look at how the teachers at Grange High saw their work. In my earlier research at Grange (Scanlon 2015) prior to the action research project, I interviewed 60% of the teaching staff over four years and uncovered, amongst much else, their construct of teachers' work, which was overwhelmingly the traditional construct of conveying knowledge within the classroom context. Teachers identified two kinds of

knowledge that they conveyed: subject or syllabus knowledge and what they called 'social skills' or 'life knowledge'. This latter knowledge was equally as important as syllabus knowledge, for teachers saw this knowledge as a 'discourse of escape' (Scanlon 2015, p. 78) which encouraged students to consider life courses different from the intergenerational welfare dependency of many Grange families. Added to the knowledge component were 'relationships, relationships, relationships' (Scanlon 2015, p. 79) formed collectively and individually with students. Finally, the majority of teachers saw supporting public education as part of their work because for them the government school was the heart of the community. These features form the taken-for-granted epistemological and ontological aspects of teachers' work at the time of the action research at Grange High.

The 14 teachers who accepted the action research challenge, 'the call to adventure', came from across the school teaching faculties; they had from one to 30 years teaching experience and with one exception had no prior experience of action research. In accepting the 'call' the teachers committed to conducting systematic classroom research on a teaching or learning issue they identified as significant to their work, to producing a written report on their research process and findings, to sharing their findings through a presentation to their colleagues and to reflecting on their research experiences in an interview.

The university partner

During my four-year research into the workings of a low socioeconomic school, there were many conversations with the principal and in one such conversation I suggested action research as a way of addressing learning and teaching challenges at Grange. When the principal adopted this suggestion it was intended that a facilitator for the project would be found within the school; however, no suitably experienced person could be found to undertake this role. I had experience as a teacher-researcher, was familiar both with action research and with the school and community through my ongoing research at Grange and so the principal suggested that I conduct the action research training. My involvement in the action research was not a formal school-university partnership in which the university partner oversees the entire research process; rather, this was an informal arrangement in which my role was limited to developing and facilitating three action research workshops. In the first workshop teachers were introduced to the concept of action research and identified an issue within their classrooms that they wanted to change or improve. The second workshop established the research parameters: assisting teachers in creating a workable collaborative framework; refining their research issue; developing a guide for locating and reviewing relevant literature; examining strategies for data collection and analysis; and constructing the final report. During the third workshop each research partnership reported on their progress and received feedback from each of the teacher-researcher teams, the principal and the university partner.

What I want to stress here is the very minimal research training afforded the teacher-researchers at Grange and my backstage role in the teachers' year-long action research. There was no ongoing supervision of the research process in terms of supporting the teacher-researchers in reviewing the literature, selecting a methodology, determining data collection, advising on data analysis or on writing the final report. The teacher research foregrounded in this volume is entirely that of the teacher-researchers, which they narrate through interview extracts and excerpts from their written action research reports. The interview extracts are the individual reflections of each of the teacher-researchers while the action report excerpts are the collective construction by each action research partnership of the various stages of their research project. The linguistic differences between the informal interview conversations and the more formal action research report have been maintained. However, it should also be noted that the action research reports are in the discourse of practice and therefore do not adhere to the kind of discourse encountered in reports of academic research. The reason for this is that as Clarke (in Elbaz 1991, p. 13) reminds us: 'The teacher's voice must speak from an embeddedness within the culture of the particular school, school system, and society in which the teacher lives and works.' The teacher-researcher action research narratives in Chapters 3–7 are intended to be read as examples of independent teacher research, not as research exemplars. Whilst all of the action research reports detail each stage of the research process, the format in which the process is narrated varies across the researchers. All of the teachers whose research is narrated in the book agreed to the publication of their work, however, the names of the teachers and the school have been changed to ensure anonymity.

Teacher-researcher narratives

In my earlier work on Grange High (Scanlon 2015) I distinguished between 'big' and 'little' stories or narratives. The big stories are told by policymakers and scholars and these play a supporting role in the teacher narratives in this book. These big stories are subsumed under the umbrella of the 'education revolution', specifically 'the digital revolution' and *National Partnerships on Low SES School Communities* (2009) and the *Improving Literacy and Numeracy Project* (ILNP) (2013–2014), which defined the national and local educational contexts in which the teachers' 'little' narratives are embedded. The 'little narratives' are also embedded within the scholarly debates about the nature of knowledge and constructs of teachers' work. The little stories are the localised accounts of the teachers' engagement *with* and *in* research as told by the teacher-researchers in their research narratives.

The structure of the book

> I don't know how many people will read the reports but it is nice to think that they are going out there.
>
> (Amanda)

Like Amanda I also do not know how many will read the teacher research in this book. I do know that teacher research is rarely read by academics and even more rarely accorded the same status as academic research when it is. These realisations left me with the dilemma of how to depict the action research of the teachers at Grange High. The teachers were self-directing, independent researchers and the research narratives are therefore theirs to tell. My role was to structure the book in such a way that the teachers' voices predominate in the telling of their research tales with as little authorial intervention as possible. However, my voice does predominate in Chapters 1 and 2, which explore through selected literature the scholarly debates on the nature of knowledge, of teachers' work and the role of research in that work.

I have structured the book using two interlocking theoretical conceptualisations – a conventional action research model and Joseph Campbell's (1993) hero's journey. Campbell's monomythical journey takes the hero from the known to the unknown world and begins with the hero answering the 'call to adventure', journeying into the unknown, facing trials and ordeals before returning to the known world and sharing the adventure with others. The teacher-researchers in the book replicate the hero's journey as they travel from the known world of teaching to the unknown world of research. They do this by circumnavigating the action research cycle, which mirrors the hero's journey, beginning with their acceptance of the principal's 'call to adventure', preparing for the journey, conducting their research and finally sharing their research findings with their colleagues and with you the reader (Figure 1).

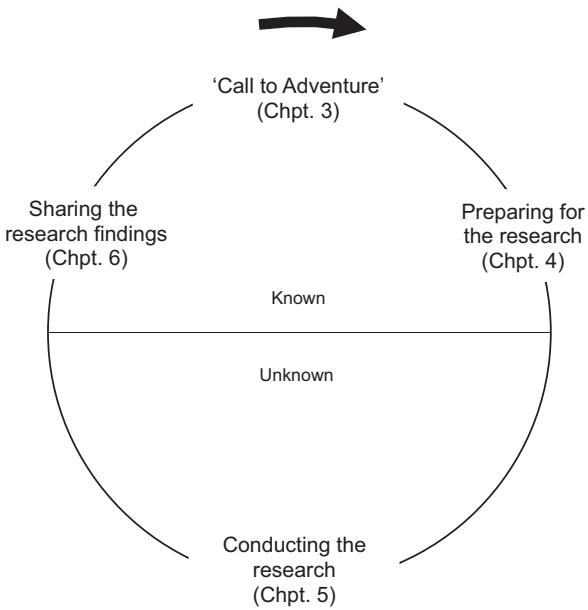

Figure 1 Waystations on the action research journey

The narratives of this journey are told in Chapters 3–6 with each chapter representing a waystation on the hero's journey and a stage in the action research process. Chapter 7 takes a different format and is in the form of a longitudinal presentation of the waystations of one particular action research journey which is a segue into a narrative of a whole school literacy initiative. Within Chapters 3–7 my comments are limited to a brief summing up at the end of each chapter. Thus these chapters have two kinds of narrative: the first and predominant narrative is ontological, what Schutz (1970) calls a first-order construct, and is the narrative that is told by the action researchers and through which they make sense of their research journey; the second, far less prominent epistemological narrative, is told briefly at the conclusion of Chapters 3–8. These narratives are my second-order construct of the action researchers' accounts and are intended to identify recurring themes in the teacher-researcher narratives and link Grange research to select literature. These epistemological comments in each chapter are not intended as evaluations of the teacher-researchers' action research; such critique I leave to the reader.

Chapter outlines

The first two chapters provide the scholarly context for the teacher-researchers' action research narratives told in later chapters. Chapter 1 opens with an exploration of the nature of knowledge seen through the lens of the sociology of knowledge, drawing specifically on the work of Berger and Luckmann (1966/1991), which illustrates the social construction of knowledge. Following this I examine debates on the nature and status of professional knowledge from the viewpoint of the sociology of the professions. This discussion begins by examining what constitutes teachers' knowledge and whether teachers can be said to have a professional knowledge base. This is followed by an exploration of the nature of researcher knowledge produced almost exclusively in universities, and why this knowledge is accorded a higher status than teachers' knowledge. This leads into a discussion of the perceived gap between researcher and teacher knowledge and suggests ways that this gap might be bridged.

Having established the salient arguments regarding the nature of knowledge in Chapter 1, Chapter 2 draws on the scholarly literature and turns to the ontological dimensions of teachers' work, that is, to their situated practices. The traditional construct of teachers' work is revealed to be that of the conveyance of other people's knowledge. A direct result of this construction is the silencing of teachers' voices in educational debates which pertain to their work. I pose the question: Should teachers be researchers? To answer this question the chapter investigates the key issues on which the debate surrounding the role of research in teachers' work hinges, namely institutional exclusivity and related epistemic concerns, questions of validity, teacher subjectivity, role conflict and workplace constraints. The final section of the chapter explores action research, the preferred model of teacher research, and examines the differing opinions surrounding its provenance, aims and how it has fared in different policy environments.

In Chapter 3 the voices of scholars are replaced by the Grange teacher-researcher accounts of their experiences of the first waystation on their action research journey. We meet the teacher-researchers for the first time as they engage in a round table discussion; this is a textual device in that it did not take place as presented. However, the words are those of the teacher-researchers taken from their reflective interviews at the conclusion of their action research journey. The teachers introduce themselves and tell us how they responded to the principal's 'call to adventure', why they believe they were selected to be researchers and the extent of their previous research experience. Following on from this, through a combination of interview extracts and excerpts from their action research reports, each of the action research teams explains their choice of a research issue and provides a rationale for their choice.

We next meet the teacher-researchers on the second waystation as they prepare for their action research journey in Chapter 4. In this chapter the neophyte researchers recount their introduction to research in the training workshops and their engagement with the research literature relevant to their research issue. From this point onwards the teacher-researchers no longer have outside support from the university partner and are now reliant upon each other to complete their action research journey. They begin this independent journey by highlighting the difficulties they faced in accessing academic literature and in breaking the code of scholarly discourse in this literature. The excerpts from the action research reports reveal the policy, theoretical and pedagogical literature consulted by the action researchers as a prelude to their own inquiry.

Chapter 5 finds the teacher-researchers in the hitherto unknown world of research, the third waystation on their action research journey. Here we see them negotiate the allocation of research tasks and determine the most appropriate data collection methods for their individual research projects. Looking back on their research the action researchers indicate what, if anything, they would change about the manner in which they conducted their research.

The final research waystation is narrated in Chapter 6; the teacher-researchers have returned from their journey to report their research findings. We learn of the challenges they faced as individuals and as a research team, what they discovered about their research issue and the degree to which the research findings met their research aims and expectations. The teacher-researchers conclude by discussing their feelings about the dissemination of their findings at a whole school staff presentation and as a written report.

In each of Chapters 3–6 the teacher-researchers told of their experiences through the waystations of the integrated action research and hero's journey cycle. Chapter 7 has a different format; and here one research team narrates their journey in its entirety, revealing their experiences in each of the waystations in a longitudinal narrative. This narrative shows how one action research project was instrumental in initiating a school 'Improving Literacy Project', the salient features of which are told in an extended interview with the facilitator of this initiative. The narratives in this chapter reveal not only the potential of action research for school change but the crucial role of the principal in supporting teacher research and valuing the knowledge emanating from this research.

In Chapter 8 I step back into the narrative, weaving together from teacher-researcher interviews the various impacts and implications of the action research initiative at Grange High. The chapter draws both on what the teachers themselves say and also on the scholarly literature. I begin by examining how the action research projects enabled the teacher-researchers to make connections with their own practice, their colleagues, their students and with the research literature. The responses of the action researchers non-researching colleagues to the research initiative are explored along with the reaction of the teacher-researchers to the considerable funds expended to realise the projects. We learn how action research is now perceived by the teacher-researchers and whether, in light of their research experiences, they would again undertake this kind of systematic inquiry or undertake research as part of a further degree.

To conclude the chapter I make brief comments on teachers' work and professional identity in light of the action research at Grange High. Of particular local importance here is the key role of the school principal in initiating and supporting teacher research and also of valuing the knowledge created through this research. The chapter extrapolates from the Grange experience the possible broader implications of constructing teachers' work to include systematic inquiry and the acknowledgement of such research findings through the distribution of their research within the research community for examination and comment. The dissemination of teachers' research in this book enables teachers to join the conversation regarding teachers as researchers – a conversation from which they are currently largely excluded.

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1 The nature of educational knowledge

Introduction

In this and the following chapter, I explore the epistemological and ontological dimensions of the role of research in teachers' work. These two interrelated dimensions are the subject of extensive scholarly debate. In this chapter I focus on the epistemological debates surrounding the nature of educational knowledge, which is conceptualised as two distinct knowledges, namely, researcher knowledge and teacher knowledge. Researcher knowledge is produced by professional researchers in universities while teachers' knowledge emanates from their practice in schools. This discussion is a prelude to the ontological discussion of the nature of teachers' work in Chapter 2.

The exploration of the epistemological debates in this chapter is undertaken through two sociological perspectives: the sociology of knowledge, where I rely specifically on the work of Berger and Luckmann (1966/1991), whose perspective highlights the reasons for the institutional, hierarchical construction and valuing of knowledge, and the sociology of the professions, where scholars have pondered the nature of the professional essence in a steady stream of debate, beginning with the work of Flexner in the early 20th century and reignited by Scuilli (2005) in the early 21st century (Scanlon 2011). Through these two theoretical frames the chapter explores the epistemological debates which in the West have created knowledge dualisms such as theory and practice, and accompanying hierarchies of knowledge such as researcher knowledge and teacher knowledge. These debates have constructed what counts as knowledge and are fundamental to an understanding of teachers' work and the potential role of research in that work. The debates also explain what scholars and teachers have long identified as a gap between practitioner and researcher knowledge.

The sociology of knowledge

I begin with the sociology of knowledge, which Mutekwe (2012, p. 808) locates within the work of Marx and Durkheim and American pragmatists such as Pierce, James and Dewey as well as in the phenomenology of Alfred Schutz – the work of Schutz only becoming accessible to the sociological community with the

publication of Berger and Luckmann's *The Social Construction of Reality* in 1966. Swidler and Arditi (1994, p. 306) identify an 'older sociology of knowledge', evidenced in the work of Mannheim, which focused on 'formal systems of ideas, concentrating especially on such matters as the world-views and the politics of intellectuals'. They contrast this traditional approach with the new sociology of knowledge, which the authors claim examines how organisations in which patterns of authority are located shape the content and structure of knowledge. It is this focus on the social construction of institutions and roles therein that makes the sociology of knowledge a pertinent frame for exploring the nature of educational knowledge in the guise of both teacher and researcher knowledge.

The sociology of knowledge is concerned with what society defines as knowledge and how this knowledge is constructed and maintained; in other words, the focus is on an analysis of the social construction of reality (Berger and Luckmann 1966/1991, p. 15). This aligns, according to Berger (in Steets 2016, p. 14), with the admonition from Schutz: 'If the sociology of knowledge is to live up to its name, it has to be concerned not just with ideas and theories but with knowledge in everyday life, with what passes for knowledge in everyday life.' This sentiment was also iterated by Young (1973, p. 214), who argued that fundamental to an exploration of knowledge is the rejection of the superiority of any one form of knowledge over another. In this way, the sociology of knowledge challenges the taken-for-granted dualisms and hierarchies traditionally associated with institutionally constructed knowledge.

The licence to produce knowledge has customarily been situated within universities and over time this has remained relatively unchallenged because 'institutions appear in the same way as given, unalterable and self-evident' and continue to flourish through the legitimation of their activities, which provide them with a 'protective cover' (Berger and Luckmann 1966/1991, pp. 77, 79). In the case of educational institutions, it is their engagement with knowledge which furnishes them with legitimation – for example, in the case of universities it is the production of knowledge widely accepted as valid, and in the case of schools it is the conveyance of knowledge. The roles of these two institutions are taken as obdurate reality which is difficult to challenge because the allocation of these different epistemological roles has resulted in specialised services which make it possible for these institutions to exist (Berger and Luckmann 1966/1991, p. 92). Any challenge to these identities, such as the production of knowledge within schools through teacher research, is a challenge to the habituated institutional order and is defended by that order, as we will see in Chapter 2.

Berger and Luckmann (1966/1991, p. 135) point out that once knowledge production became institutionalised, the knowledge producers began to operate on a level of 'abstraction from the vicissitudes of everyday life', opening the way for potential conflict between experts and practitioners because the latter 'may come to resent the experts' grandiose pretensions and the concrete social privileges that accompany them' (Berger and Luckmann 1966/1991, p. 136). What is likely to be particularly galling is the silencing of practitioner voices, as experts claim to know the ultimate significance of the practitioners' activity

better than the practitioners themselves. This is reflected in the perceived gap between teacher and researcher knowledge explored later in this chapter.

The sociology of knowledge is a way of explaining situated knowledge work within universities and schools and why these long-standing, hierarchical arrangements become taken-for-granted reality and therefore difficult to challenge and, by extension, why research is accepted as the preserve of academics in universities and not considered the work of teachers in schools. The sociology of the professions provides further insight into another knowledge hierarchy and again problematises the nature of knowledge and of teachers' work.

The sociology of the professions

There has been a prodigious outpouring of work on the professions over the past 100 years, beginning with the first systematic study by Flexner (1910) in the United States and Tawney (1921) in the United Kingdom. This work was followed by that of Carr-Saunders and Wilson (1933), Etzione (1969); Freidson (2001), Scuilli (2005) and Dingwell (2008), to name but a few (Scanlon 2011, p. 19). All of these scholars agree that the professions are knowledge-based endeavours, and that the 'basis of professional authority is knowledge' (Etzione 1969, p. xiii). It is, however, the nature of that knowledge about which scholars disagree and it is this that has had an impact on how teachers' work and knowledge is conceptualised and actualised.

Educational knowledge as teachers' knowledge

Within the literature on the professions there is a distinct hierarchy of knowledges, with medicine, law and engineering, for example, rating significantly higher than the knowledge of the so-called semi-professions such as teaching and nursing. Within this hierarchy, teachers' knowledge is seen as not meeting the criteria for elite status because it is neither exclusive nor generalisable.

The exclusivity criterion

The argument here is that teachers' knowledge fails the exclusivity test, Maxwell (2015, p. 100) observes, because their subject knowledge is possessed by almost all adults who have been to school. This is compounded, Maxwell continues, by the generally held belief, even amongst teachers, that 'good teaching is more of a knack than a highly-trained skill'. Teachers themselves, educational institutions and governments have colluded in advertising the non-elite status of teachers' knowledge through their development and participation in truncated teacher education programmes which undermine claims to high-stakes knowledge. Maxwell (2015) refers to these as 'quick fix' teacher preparation programmes and cites *Teach First* in the United Kingdom and *Teach for America* in the United States. Australia has also been complicit with the introduction of *Teach for Australia*. Tatto and Furlong (2015, p. 146) note that these accelerated school-based

programmes have undermined other attempts to improve the professional status of teachers through, for example, the raising of entry standards. The reduced programmes counterpoise the long, arduous training traditionally associated with high-status professions (Scanlon 2011, p. 21). Maxwell (2015, p. 101) suggests that if such initiatives occurred in other professional areas, such as engineering, dentistry or medicine, there would be 'public outrage'; this has not been the case with the teacher preparation programmes.

The generalisable criterion

The claim here is that teachers' knowledge is not generalisable because unlike the knowledge of the elite professions it does not transcend contexts. Elbaz (1991, p. 13) explores this by drawing on a distinction made by Hall between 'high-context' and 'low-context' thinking. 'High context' refers to knowledge that is embedded in a physical context or within a person; 'low-context' is conveyed through an 'explicit language code'. Teachers' knowledge is primarily 'high context' whereas researchers' knowledge, which I explore in the following section of this chapter, is 'low context' and hence generalisable in a way that 'high-context' knowledge is not. Labaree (2003, p. 14) makes a similar distinction referring to hard/soft and pure/applied knowledge. Teachers' knowledge, he contends, is 'very applied and very soft' because it arises from an institution rather than from theory and is soft because it 'cannot transcend time, place, and person' and is 'mushy, highly contingent, and heavily qualified'. However, it is 'high-context' knowledge, or as Korthagen (2007, p. 306) puts it, 'action-guiding knowledge' which enables teachers to deal with context-specific practical situations. McIntyre (2005, p. 360) maintains that teachers' knowledge, as well as being contextual, is embodied in the person of the teacher and is therefore 'fundamentally personalised' knowledge which is 'dependent above all else on the knowledge, values, commitment, human insights, skills, sensitivity, enthusiasm, humanity and, in summary, the person of the teacher'. It is this knowledge which has not been subject to sustained, systematic inquiry by teachers themselves.

Scholars such as Hargreaves (1999, p. 129) have tackled the criteria of context specificity, embodiment and generalisability by distinguishing between transferability, the transmission of knowledge between persons, and transposability, which is the movement of knowledge between places. According to Hargreaves, knowledge or practice is transposable when, for example, a teacher takes a pedagogical practice from one classroom or school to another. Lohrey (Department of Employment, Education and Training 1995, p. 25) takes a similar view, although preferring the word 'transfer', arguing that transfer occurs between situations because the consciousness of the individual is common to all contexts, and it is the individual who brings prior learning to bear on new or different contexts. Transfer is therefore a transformative process which requires the learner to be an active agent by consciously manipulating the transformation of knowledge, which for Thomson (2015, p. 310) means 'What is transferable is the practice of action research itself – cycles of reflection and action.'

Do teachers have a knowledge base?

Taken together, the above arguments about the status of teachers' knowledge have led to suggestions that teaching does not have a recognisable knowledge base in the same way as the elite professions; this undermines the claims of teachers to professional status. Notable in refuting these arguments is Shulman (1987), who asserts that teachers possess a range of knowledges which taken together form an identifiable knowledge base. These knowledges include pedagogical knowledge, pedagogical content knowledge, curriculum knowledge, knowledge of learners, knowledge of educational contexts and knowledge of educational ends and purposes. The core of teaching for Shulman is pedagogical content knowledge, which is where theory and practice are integrated. Lyons (1990, p. 160) illustrates this concept of pedagogical content knowledge, describing the 'web of teachers' work' in the following way:

> teachers hover in thought and imagination around the needs of their students, a body of subject matter knowledge, and the ways they endeavour to have their students encounter it, they hone a craft responsive to all elements on their horizon.
>
> (Lyons 1990, p. 160)

Lyons (1990, p. 173) further describes teachers' knowledge as consisting of 'nested epistemologies' characterised by the 'the interdependence of students and teachers as knowers in learning'. Hiebert et al. (2002, p. 4) equate teachers' knowledge with 'practitioner knowledge' or 'craft knowledge', which is generated when teachers engage in 'active participation and reflection on their own practice'. They do, however, recognise that this knowledge, while it is detailed, concrete, specific and integrated, is not public, storable, shareable or verifiable (Hiebert et al. 2002, pp. 6–8). For McIntyre (2005, p. 359) teachers' knowledge consists of subject knowledge, knowledge about students' learning and thinking, the curricula and contextual knowledge. What particularly interests McIntyre is pedagogical knowledge; this is knowledge-how, useful contextually specific knowledge enabling teachers 'to address the context-specific and indeed unique characteristics of every class, pupil, lesson and situation with which they have to deal'.

An eclectic view of a knowledge base for teaching comes from Carr and Kemmis (1986, pp. 41–2), who observe that teachers use common-sense knowledge, folk wisdom, skill knowledge, contextual knowledge, professional knowledge, educational theory, social and moral theories as well as having a general philosophical outlook. These authors rescue teachers' knowledge from a second-class status by arguing that while teachers' knowledge is grounded in habit, ritual, precedent, custom and opinion, teachers nonetheless possess some 'theory' of education which structures and guides their activities (Carr and Kemmis 1986, pp. 111–13). Another approach to teachers' knowledge is that of Winch et al. (2015, pp. 205–6), who identify situated understanding or practical wisdom, which enables teachers to grasp situations and to make ethical and sound

judgement; technical 'know how', which enables teachers to plan; and critical reflection, which entails teachers systematically reviewing what they have done with a view to future improvement. Whichever classification of teachers' knowledge is adopted in developing an argument for the possession of a knowledge base by teachers, a significant aspect, noted by Colmer and Daly (2004, p. 273), is its evolutionary nature ensuring that teachers' knowledge is 'shaped by the multiple interactions they experience in the course of a lesson, a day, a year'. It is this evolutionary aspect which signifies the possible reconstruction of teachers' work through the inclusion of research and by so doing potentially affords teachers' knowledge comparable status with researchers' knowledge.

In this brief overview of the nature of teachers' knowledge, scholars have identified a number of features which separate teachers' knowledge from that of other professionals and indeed from that of university-bound academic researchers. What is particularly significant for the discussion here is that teachers' knowledge is largely ignored by educational researchers who, according to Zeichner (1995, p. 155), are insensitive to the complex circumstances that teachers face in their work. McIntyre (2005, p. 360) maintains that academic researchers, unlike teachers, search for 'simplifying patterns' and 'silver bullets', which Dewey argues failed because of the complexity of educational situations (McDonough 2012, pp. 11–12).

Educational knowledge as researchers' knowledge

In the discussion in this section of the chapter I equate researcher knowledge with what teachers generally perceive as theoretical knowledge, that is, knowledge produced in the academy away from the context of practice. This high-status knowledge is almost exclusively the creation of research professionals in universities who are neither the users of their own research findings nor write for practitioners; they write for each other in peer-reviewed journals not easily accessible to teachers, according to Hargreaves (1996, p. 6). The greater prestige of researcher knowledge resides in patterns of social authority which stem from, for example, an institution, group or person which or who can settle disputes and establish truth (Swidler and Arditi 1994, p. 311); this is the perspective of the sociology of knowledge. The greater prestige of this knowledge also resides in the fact that it is constructed away from practice, reported in the discourse of the academy rather than the discourse of practice, and unlike teacher knowledge is considered to be generalisable across contexts. However, it is these very features of elite status which render researcher knowledge problematic for practitioners.

Knowledge constructed away from practice

Researcher knowledge, because it is constructed away from practice, is, according to Hargreaves (1996), constructed differently from practitioners' knowledge. The world in which this knowledge is produced is 'an impersonal, distant cultural world organized by abstract principles such as individualism or rationality' (Swidler

and Arditi 1994, p. 313). The result, Polkinghorne (2010, p. 394) points out, is that theoretical knowledge does not focus on the 'complex life world of a person'. This means, as Korthagen (2007, p. 307) suggests, researchers focus too one-sidedly on formal knowledge whilst overlooking perceptual awareness and individual ways of relating to the world. Carr (2006, p. 155) claims that theoretical knowledge is portrayed as 'a unique source of rationally vindicated educational knowledge … [the] custodian of the intellectual virtues of objectivity, validity and truth' and in this guise is in sharp contrast to teacher knowledge.

Not only is researcher knowledge produced almost exclusively in universities but in fewer and fewer of the so-called 'elite' research universities. The reason for this is 'if spread among all institutions, the nexus (i.e. between research, teaching and study) will become too costly, underfunded in unit support, and weakened by diffusion' (Clark in Badley 2002, p. 446). This trend, which has increased since Clark's comment, has been accompanied by the growing tendency to distinguish not only between research and teaching universities but also within universities, with the creation of research-only and teaching-only positions, with universities paying lip service to the equal importance of teaching and research.

Knowledge reported in the discourse of the academy

A consequence of the construction of researcher knowledge away from practice is that researchers' findings and recommendations are reported in a specialised language 'which makes sense only to members of particular sub communities of academic researchers', which further makes teachers sceptical of educational research (Zeichner 1995, p. 155). The result is 'Ivory Tower Syndrome' knowledge (Gore and Gitlin 2004, p. 42) produced in 'a rarefied domain' (Kincheloe 2003, p. 18), which appears to teachers as 'disembodied' and 'remote' (Atkin 1992, p. 382). Furthermore, Lytle and Cochran-Smith (1992, p. 450) submit that when knowledge about teaching is generated outside of teaching then this knowledge is viewed by teachers as 'disenfranchising' and 'exclusionary'. This is a 'studying down' of teachers and the production of research 'abstracted from the lived world of school', according to Kincheloe (2003, p. 35), in which researchers rarely consult practitioners when setting their research questions (Rynes et al. 2001, p. 340).

Knowledge generalisable across contexts

Researcher knowledge constructed away from practice and reported in the language of the academy is also lauded as generalisable across contexts. It is 'held to be time and place insensitive. Its conclusions about what works are thought not to be affected by the particular week they are carried out, or by the particular place in which they are enacted' (Polkinghorne 2010, p. 394). However, Dewey (in Biesta 2007, p. 16) points out, 'no conclusion of scientific research can be converted into an immediate rule of educational art'; all research can provide is an understanding 'of what worked, but cannot tell us what works'.

This explains why knowledge formulated in generalised terms is of little assistance to classroom teachers and accounts for the limited impact of research in schools. This is propositional knowledge which may contribute to pedagogical knowledge; however, it cannot merely be translated into pedagogical knowledge because researcher knowledge is theoretical and abstract in nature (McIntyre 2005, pp. 359–60). Similarly Shulman (1998, p. 518) considers that knowledge 'grown by scholars in the academy' cannot be classified as professional knowledge until it is enacted by teachers. Carr (2006, p. 153) adds that the practical influence of educational theory will be determined by local and contingent factors and will vary according to shifting configurations of political expediency, dominant interests and vested power.

What is particularly problematic for teacher research is that it is researchers' generalisable, neutral knowledge which is pursued and valued by governments. This is evidenced in the way the Institute of Education Sciences in the United States emphasises experimental educational research and dismisses qualitative research as a way to construct scientific knowledge (Roulston et al. 2005, p. 172). More recently in Australia, the Australian Productivity Commission in 2016 recommended the pursuit of 'high quality research, particularly randomised controlled trials' as a means to target and discontinue ineffective programmes (Cook 2016, p. 3). The Commission also endorsed the creation of a new Education Agreement which would ensure the application of educational 'research that works best'. This reflects the Australian federal government's elusive search for the educational 'silver bullet' to improve educational outcomes through more and more testing and the amassing of more and more statistics. However, the collection of statistics through regular NAPLAN (National Assessment Program – Literacy and Numeracy) testing and the publication of individual school results on the My School website and the increased emphasis on PISA (Programme for International Student Assessment) rankings has done little to improve Australian students' literacy or international rankings. This is evidence of the claim by Broekkamp and van Hout-Wolters (2007) that the findings from educational research yield few conclusive or practical results.

What is clear from the above discussion is that there is a gap between teachers' knowledge and researchers' knowledge both in construction, reportage and application. How then might this gap be addressed?

Bridging the gap

The gap between researchers and practitioners is the fatal flaw in educational research (Hargreaves 1996, p. 6) and can be seen as a gap between 'professional cultures' according to Korthagen (2007, p. 304). A similar claim is made by Roth et al. (2013, p. 522), who see the gap between teacher and researcher knowledge as 'frozen into, and embodied by, societal divisions of labor and institutions'. This is the result, they continue, of an historical division by scholars who separated the practical from the theoretical but privileged the latter over the former. This has over time become legitimated through the habituation of

the division of labour within institutions – the position taken by the sociology of knowledge explicated earlier in this chapter.

There is considerable discussion of ways to bridge the gap between teacher and researcher knowledge, including the incorporation of research into teachers' work. A letter to the editor in the *Sydney Morning Herald* (Redmayne 2016, p. 16) alludes to this gap and poignantly describes the attitude of a teacher to academic research and offers a gap-closing solution. The writer of this letter suggests that the way to improve student outcomes is to 'Stop listening to the so-called experts who continue to pontificate jargon from educational ivory towers, and listen to the pragmatists at the chalk face.'

A suggestion from Badley (2002, p. 452) is that 'instead of seeing a rigid boundary between research and teaching, we could construct a (really) useful boundary-spanning link between the two by seeing them both as modes of inquiry'. Badley is commenting here on the gap between research and teaching within the university but it equally applies to the gap between teaching and research more generally. Korthagen (2007, p. 308) long advocated that teachers become researchers, thus uniting theory and practice 'within one person'. The solution, Kemmis (2009, p. 468) supports, lies in action research, which 'treats theorists as practitioners and practitioners as theorists'. It is not so much closing the gap, he continues, 'between theory and practice, but in closing the gap between the roles of theorist and practitioner' and to me this implies a reconstruction of teachers' work.

If researcher knowledge is of limited value to practitioners in their daily practice, surely it follows that teachers' work must include the possibility of knowledge generation through teacher research. However, there has been no consistent groundswell movement from the academy nor it must be said from teachers themselves for an alternate construct of teachers' work. There is nonetheless a strong advocacy from many scholars for the work of teachers to embrace research and thus create knowledge of value to practice. There is also equally strong advocacy against teachers as researchers and it is to both of these advocacies that the following chapter turns.

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2 The nature of teachers' work

Introduction

This chapter focuses on the ontological dimension of teachers' work through an exploration of the nature of their work and the role of research in that work. The chapter begins with a survey of selected literature to determine the traditional construct of teachers' work and the way in which traditional constructs of this work have resulted in the silencing of teachers' voices in educational debates. Following this, the chapter explores salient issues in the debate regarding the inclusion of research in teachers' work, namely, institutional exclusivity and related epistemic concerns, questions of validity, teacher subjectivity, role conflict and workplace constraints. When teachers become researchers, the most popular model of research is action research and so the chapter concludes by examining the origins and directions taken by adherents of action research and the way in which action research fortunes have waxed and waned over time and within different policy environments.

Teachers' work

> Classroom work forms the heart of teaching, as it is usually understood. Relatively speaking, all other activities are peripheral or supplementary by comparison.
>
> (Hargreaves 1989, p. 7)

Over time the nature of teachers' work has been widely accepted as the classroom-based conveyance of other people's knowledge. This conveyance metaphor is not only the view of those outside the profession but, according to Andy Hargreaves (1995, p. 13), 'classroom teaching, even for teachers, remains central to the definition of what teaching is'. It is in the classroom that the teacher 'spreads the butter which the scientist, the explorer, the poet, and the historian make, even if he [sic] finds time to make a little butter himself' (Wallas 1921, p. 149). Similarly, Geer (1966, p. 37) noted that the teacher is 'a conveyor and transmitter, but not a creator of knowledge', and Elbaz (1981, p. 45) observed there is little encouragement for teachers to view themselves as originators of knowledge. While Andy Hargreaves (1989, p. 7) remarked that the classroom

was the 'core commitment' of teachers and commented on the failure to include research in constructions of teachers' work, David Hargreaves (1996, p. 3) observed, '[T]eaching is not, at present, a research-based profession. I have no doubt that if it were, teaching would be more effective and more satisfying.'

In the 21st century Blumenreich and Falk (2006, p. 865) take a more optimistic view of the role of research as teachers' work, noting that there was a new perspective originating in the 1970s and 1980s when the view of the 'teacher as technician, consumer, receiver, transmitter, and implementer of other people's knowledge gave way to a view of the teacher as a knower, a thinker, and as an agent of change'. However, more recently Willegems et al. (2017, p. 232) found 'many teachers consider the work of practice as their core business, and consider research work as ballast, something that unnecessarily steals time from teaching'. The authors suggest that this situation persists because 'teachers in the schools, who serve as models, do not frame themselves as researchers' (Willegems et al. 2017, p. 231). The result is that new teachers, once in schools, assume the institutionally specific roles assigned to them and these roles rarely include research as a component part. These institutional identities and associated patterns of conduct which flow from them are taken to be paramount reality when in fact they are arbitrary descriptions, according to Esland (1971, p. 78), and as such are open to renegotiation.

In the 21st century the traditional construct of teachers' work as classroom-based conveyance of other people's knowledge continues to persist with the result that, as a group, teachers are denied a place at the educational research table. It follows from this that their voices are rarely heard in educational debates which have a direct impact on their work.

The silencing of teachers' voices

> I cannot hear the practitioners' voices or the practitioners' thoughts; nor can I comprehend a real educational innovation…. Ultimately, there are too many theories and too many educationalists, and not enough practitioners; or – to put it another way – 'too many strategists and not enough doers'.
>
> (Penalva 2014, p. 412)

The extent to which teachers are silenced in educational debates about their work is evident in the above comment by Penalva and from a cursory glance at the literature. For example, Geer (1966, p. 45) commented that 'everyone except teachers seems to write and speak about them'. Similarly, Lytle and Cochran-Smith (in Zeichner 2009, p. 78) noted that: 'Conspicuous by their absence from the literature of research on teaching are the voices of teachers, the questions and problems they pose, the frameworks they use to interpret and improve their practice, and the ways they define and understand their work lives.' Hampton (1993, p. 259) similarly found that others 'speak about' teachers rather than teachers speaking 'the problem of life in classrooms'.

To have a voice in educational debates requires a sharing of educational knowledge and as long as teachers' work is constructed as the conveyance rather than the creation of knowledge it follows that there are limited opportunities for teachers to engage in research or to share their work with others. Geer (1966, p. 41) remarked that the teacher is confined by the 'four walls of his [sic] classroom' and hence has no audience apart from the students. This results, as Elbaz (1991) points out, in teachers being unaware of the knowledge of other teachers and even unaware of the extent of their own knowledge.

According to Rust and Meyers (2006, p. 70), where teachers' research 'has made its way into scholarship' it has not done so on its own merits but 'as the focus of academic research'. This can result, as Elbaz (1991, p. 11) observed, in 'turning teachers' knowledge into researchers' knowledge, colonizing it, and thus silencing the voice of the teacher'. More recently Leat et al. (2015, p. 271) commented that when teachers' voices are published they are generally authored by academics. Writing in the 1990s, Lytle and Cochran-Smith (1992, p. 464) found there were few forums for the publication of teachers' research and I suggest there is still no forum in which teacher knowledge can be disseminated and receive equal parity with researcher knowledge. It is for this reason that it is the teacher-researchers who narrate their research in Chapters 3–7 of this volume. Hopefully this approach may go some way to addressing Hargreaves' call for alternate models for the dissemination of teacher knowledge:

> the old models of dissemination need to be replaced and doing so is a condition of promoting the very knowledge creation on which more effective schooling depends. A new model of knowledge creation in education entails a different model of dissemination.
>
> (Hargreaves 1999, p. 129)

Giving voice to teachers is a complex issue and involves more than the dissemination of teacher research. For example, Morrison (Elbaz 1991, p. 10) points out that having a voice 'implies that one has a language in which to give expression to one's authentic concerns' and that there is 'an audience of significant others who will listen'. Elbaz (1991, p. 10) follows this with the question, 'What kind of discourse is being used and to what extent does it allow the authentic expression of teachers' experiences and concerns?' The teacher-researchers in this book report their research experiences in a discourse which emanates from and reflects the classrooms, school and community in which they teach.

The question that needs to be next addressed is: Should teachers be researchers? In the continual search, in Australia and other countries, for improved educational outcomes, there is no recognition that rather than search for generalised solutions to educational problems, funds might be better employed to find local answers to local questions from teachers in classrooms who deal daily with the particularities of local communities, schools and students. This recognition would enable the voices of teachers, the frontline educational workers whose voices are silent in debates about 'what works', to be given equal status with research professionals.

Should teachers be researchers?

In recent years, researchers and teachers have been censured for failing to ensure that teaching is based on research findings (McIntyre 2005, p. 357). This has occurred because 'it is researchers, not practitioners, who determine the agenda for educational research' (Hargreaves 1996, p. 6). Why then should teachers not set the research agenda intended to inform their practice? When this question is raised it invokes vigorous debate amongst academics and these debates centre on a number of issues including: institutional exclusivity and related epistemic concerns, questions of validity, teacher subjectivity, role conflict and workplace constraints.

Institutional exclusivity and epistemic concerns

In the Introduction to this book the Australian researcher John Hattie was quoted as saying that teachers should leave research to academics. Statements such as this introduce into the teacher-researcher debate issues of institutional exclusivity, referred to in Chapter 1, because teacher research 'has the potential to collide with the long-standing tradition of universities to privilege research while holding teaching and service in relatively low regard' (Cochran-Smith and Lytle 1999, p. 21). Abbot (in Swidler and Arditi 1994, p. 319) contends that when their jurisdictions are challenged, professionals compete to define and establish exclusive control over their domains. Teachers as researchers are raiders or interlopers into the territory of the academic researcher, whose territorial integrity must be defended. These raiders, Cochran-Smith and Lytle (1999, p. 22) suggest, have the potential to create dissonance by challenging the hierarchical arrangements of schools and universities by blurring the boundaries between 'teachers and researchers, knowers and doers, and experts and novices'. Eikeland (2012, p. 12) similarly refers to the capacity of teacher-researchers to challenge the traditional, institutionalised division of labour. The reason teacher research has this destabilising capacity comes from its democratic focus, which seeks to close the gap between 'the researcher and the researched upon' (McIntosh 2010, p. 33). This subversive possibility was observed by Stenhouse (1981, p. 104), who recognised that: 'It is teachers who in the end will change the world of the school by understanding it.' If teachers in sufficient numbers assume the mantle of researchers, they have the potential to make an epistemological assault on the institutional exclusivity of the universities.

The exclusive production of knowledge in universities has relegated teacher knowledge to a second-class status, which we saw in Chapter 1. This can be seen in the way academics are happy to recognise practitioner research as a form of local knowledge but not when it is presented as public knowledge with epistemic claims beyond practice (Anderson and Herr 1999, p. 14). Another tactic employed by academics, according to Zeichner (1995, p. 153), is to label teacher research as a form of professional development rather than a form of knowledge production. As a consequence, teacher knowledge is not taken 'seriously as educational

knowledge to be analyzed and discussed' (Zeichner 1995, p. 160). It is therefore rare to see academics cite teacher-produced knowledge or to see teacher knowledge integrated into teacher education programmes. When issues of institutional exclusivity are raised, they lead to questions about the validity of knowledge produced in situations removed from the academy.

Questions of validity

Questions about the validity of teacher inquiry in the form of action research are about truth claims and are frequently grounded in positivist, realist epistemologies and derive from statistical research conventions of the 1960s (Heikkinen et al. 2012, p. 5). The positivist epistemological origin of validity, along with reliability and generalisability, Kvale (1995, p. 20) maintains, have attained 'the status of a scientific holy trinity'. Today, with the trend towards postmodernism and qualitative research, not only has validity become a contested concept but there are now multiple ways to evaluate the 'goodness' of research (Heikkinen et al. 2012, p. 6). For example, Cronbach and Meehl (Eikeland 2006, p. 199) refer to 'construct validity' which results from an interplay between observation, reasoning and imagination and a valid explanation of why things are the way they are. Other scholars use the term 'situational validity' to mean that research results must be relevant to practice (Garrison 1994, p. 12) or 'proved in practice' (Kincheloe 2003, p. 43). My own stance on the validity of teacher research is to adhere to the symbolic interactionist position that research accounts should resonate with verisimilitude, truth-like statements. The issue of research validity is not only about institutional exclusivity, it is also about what critics claim is the subjective stance of teachers in schools.

Teacher subjectivity

Arguments about teacher subjectivity rest on the claim that teachers are too close to the research site. Pine (1992, p. 657) comments when referring to arguments by those who oppose teacher research: 'teachers are too involved, too close to their students, or that they cannot see the bigger picture well enough to connect their students' learning to that of other students in different settings'. Huberman (in Cochran-Smith and Lytle 1999, p. 20) points to the possibilities of 'delusion and distortion' caused by familiarity with the research site because understanding events as a participant 'is excruciatingly difficult if not impossible'.

Those who advocate the inclusion of research in teachers' work take a different view and welcome the subjective stance of the teacher, which is treated not as 'bias' but rather as insider knowledge, that is, 'knowledge of' or contextually specific knowledge, to use Schutz's (1944, p. 499) terminology. Thomas (1997, p. 85) suggests that it is not teachers' closeness to the research site that is problematic but the theoretical perspectives of professional researchers which structure and constrain thought that make them vulnerable to bias because,

unlike teachers, they are distanced from, and have no responsibility to, the research site. This reflects Blumer's (1969, p. 86) warning that the aloof 'objective' observer risks subjectivism because such an observer 'is likely to fill in the process of interpretation with his [sic] own surmises in place of catching the process as it occurs in the experience of the acting unit which uses it'.

It is teachers' intimate familiarity which anchors the teacher-researcher to the research site (Smetherham 1978, p. 97). Teachers have the potential to be, in the words of Fahim and Ohnuki-Tierney (in Clifford and Marcus 1986, p. 9), 'indigenous' researchers and from this position can offer angles and depths of understanding to a research field normally dominated by outsiders. This intimate knowledge is what Eisner (1991, p. 68) calls 'connoisseurship' and is the means by which researchers come to know the complexities, the nuances and subtleties of aspects of the world in which they have a special interest. Griffiths (1985, p. 211) suggests that the stock of knowledge that teacher-researchers bring to educational research enables them to understand the subtle links between situations and events and to better understand the implications of following particular avenues of inquiry. My experience as a teacher-researcher enabled me to collect the kind of data that could never have been collected by 'hanging about' at the back of other people's classrooms, a stranger in the room, an observer but not a participant, as Measor (1985, p. 61) phrases it. However, for some teacher-researchers classroom inquiry may lead to a conflict between the roles of teacher and researcher.

Role conflict

McIntyre (1997, p. 132), in response to Elliott's endorsement of teacher research, suggests it is unreasonable to expect teachers to be researchers because the expertise of the two activities is very different. However, he concedes that much depends on what 'research' and 'involvement in educational research' actually mean. McLaughlin (2004, p. 129) and Hammersley (2002, p. 9) view the differing roles of teachers and researchers as overlapping but not isomorphic and this has proved problematic for some scholars in accepting teachers as researchers. Wong, an academic who spent time as a classroom teacher-researcher (perhaps it is more correct to say as a researcher-teacher), illustrates this role differentiation and the resulting problems:

> From the 'insider' role as the teacher, I was able to make the inquiry sensitive and responsive to subtle details or unanticipated events. Almost immediately, however, I was confronted with the challenge of being both a researcher and a teacher.
>
> (Wong 1995, p. 22)

The main challenge for Wong (1995, p. 25) was in the differing priorities of the two roles. The role of the researcher he saw as one of understanding, and that of teacher as one of helping students to learn: 'I felt a distinct tension between trying to be systematic and thorough and trying to be responsive and compassionate.'

Not all teacher-researchers experience these role conflicts as the research accounts of Wilson (1995); Baumann (1996); and Scanlon (2002) reveal. I begin with my own experiences as a teacher-researcher during my classroom-based PhD research (Scanlon 2002, pp. 128–34). I found the joint role of teacher-researcher to be a complex one but one in which rather than collide, the roles coalesced differently at different times during the research process.

The context of my research was in a college of technical and further education where I was a faculty head teacher. There developed within this research context a reciprocity between myself and the students which enhanced my understanding of students' learning and wider life experiences. The students were familiar with my role as a teacher but did not readily understand my role as a researcher. They observed me engaged in learning tasks similar to those in which they were engaged and so saw me as a student, which indeed I was. As a teacher I had always had a keen interest in the learning life of my students, but now, for the first time, students had the opportunity to take the same interest and indeed curiosity in my learning life, which they compared with their own. Students, as partners in the research, developed a proprietorial interest in my research, specifically in the thesis which became 'our book'. Students inquired about my research, gave me encouragement and support, and were intrigued by the mysterious person of the supervisor whom I visited regularly.

While there were discontinuities between my roles as teacher and researcher, there were also continuities resulting from the congruence between my research methodology grounded in symbolic interactionism and my student-centred pedagogical practice; over time the two roles became increasingly aligned. The boundaries between the roles I conceptualised as permeable so that as one role changed, there were subsequent changes in the other. Similarly, the boundaries between the roles and the context were also permeable and each was affected by the other in a constantly changing relationship. I am not suggesting that there was a linear development over time; what I am suggesting is that at various points in the research the roles were aligned differently but were always complementary.

A somewhat similar experience is noted by Wilson (1995) and Baumann (1996), both of whom commented on Wong's experience. Where Wong saw tension between the role of researcher and teacher, Wilson sees 'intention'. Unlike Wong, she saw the unpredictability and complexity of the school as essential to her research and did not find a tension between researcher and teacher. There was for her no bifurcation of roles, but rather an integration of the two within the classroom:

> I'm Suzanne, moved at once to help students learn and intensely curious about teaching and learning. In the room and in relation with my students, I am teaching. I am also collecting information . . . that can be used in subsequent analyses.
>
> (Wilson 1995, p. 20)

However, she does point out that researching on or about one's own teaching 'lands one in a complicated epistemological, practical, and intellectual bog' (Wilson 1995, pp. 20–1).

Baumann (1996, p. 31) also took time away from academe to teach and research in a school and responded to the comments of both Wong and Wilson. Like Wilson, he did not feel a tension between the two roles and found that the 'research process, therefore, was compatible with my teaching and had a positive impact on my instructional program'. Baumann does acknowledge that while he did not experience tension between the two roles, what he did experience was tension 'associated with time and task constraints . . . [t]ime is the eternal lament of teachers'. As an academic he recognised that some of these issues were related to having to re-learn the work of teaching. He also suggests that the research methodology of the teacher-researcher may be significant and had he brought a more quantitative methodology to his research project, as did Wong, he may well have found more tension.

> If we begin to think of teacher research as its own genre and teacher researchers as methodologists trying to solve vexing logistical and philosophical problems in classroom inquiry, conflicts or tensions become a natural, if not healthy, aspect of the research evolutionary process.
>
> (Baumann 1996, p. 34)

Another approach to the roles of teacher-researcher is that of Joseph (2007, p. 283), who was guided by Greene's (1973, p. 11) advice that 'the everyday must be rendered problematic so that questions may be posed', and to do this Greene employed the metaphor of 'teacher as stranger', where teachers need to question the commonplace and problematise practice. The final issue that makes teacher inquiry challenging for teachers is the workplace constraints that teachers who engage in research must confront.

Workplace constraints

Scholars and teachers have both pointed to the workplace constraints that render the inclusion of research in teachers' work problematic. The most frequently cited of these include school climate, lack of rewards for teachers to engage in research and lack of time.

School climate

In my experience, a far greater obstacle to teacher research than any other was recognised by Stenhouse (1975, p. 159) when he pointed to the social climate of the school and the degree of support for research afforded to teachers by the school. Grundy (1994, p. 24) reminds us that the school is not simply 'the location of teachers' work' but is an organisation 'which structures, enables and/or constrains educational work' and in which structure there is no space

in a teacher's day for research. Wong (1995) found that teaching in a school was a significant limitation to being a researcher because of the unpredictability of schools and the need for teachers to 'control' students. However, if educational research is to be of value to practitioners, surely it must take into account the complex 'real' world of the school in which control of day-to-day complexities is simply an illusion – a point illustrated in the research accounts of the teacher-researchers in this book.

Lack of rewards

Related to the lack of support for teachers to engage in research is the absence of a reward system for them if they do. Lortie (1969, p. 34) points out that teacher rewards 'depend primarily on what takes place in the classroom'; moreover, there is no expectation that teachers will 'record their experiences in such a way that it becomes the general property of the professional group' and there is no provision in the daily schedule of teachers for such activity (Lortie 1969, p. 29). Anderson and Herr (1999, p. 14) also point to the lack of rewards for teachers to engage in and disseminate their research as major obstacles which discourage the development of the teacher-researcher genre. Gore and Gitlin (2004, p. 50) likewise stress the impact of the absence of rewards for teachers, which has resulted in teachers not even keeping up 'with current thinking on educational issues'.

Time

Another workplace constraint noted by scholars and teachers alike is time. Time is a complex concept and Andy Hargreaves (1995, pp. 5, 9) explains the essential difference between technical-rational time and phenomenological time. In the first instance, time is a resource which can be managed, decreased, increased, manipulated and organised; it is an objective variable. Phenomenological time is subjective 'where time has an inner duration which varies from person to person'. Andy Hargreaves (1989, p. 3) states that teachers take time seriously and it is central to the formation of their work; it is not just an 'oppressive constraint' and it is through the prism of time we can see the ways that teachers construct their work.

> Time is therefore more than a minor organizational contingency, inhibiting or facilitating management's attempts to bring about change. Its definition and imposition form part of the very core of teachers' work and of the policies and perceptions of those who administer such work.
>
> (Hargreaves 1989, p. 3)

Stenhouse uses the expression 'economy of time' (1975, p. 157), which he says excludes all but the most enthusiastic teachers from research because of the staffing and organisation in schools. Peters (2004, p. 547) uses Andy Hargreaves' notion of teachers as 'prisoners of time' to explain that in her experience even

when teachers were provided with release time for research, this was not always sufficient for research purposes at a busy time of the year. Furthermore, Peters found that when teachers did take release from class, they felt they were letting their students down. Teachers do not, according to Johnston (1994, p. 42), have time to come together to discuss professional issues. It is for this reason that teachers either do not begin research or, if they do, discontinue because they see research as beyond 'normal' duties. The result is that research 'will always be restricted to a minority of enthusiasts and converts' (Clayton et al. 2008, p. 81).

Advocacy of teacher research does not of course imply the uncritical acceptance of this form of research and so this section of the chapter ends with a note of caution.

> Uncritical glorification of knowledge generated through teacher research is condescending toward teachers and disrespectful of the genuine contribution they can make both to the improvement of their own individual practice and to the greater social good.
>
> (Zeichner 1995, p. 166)

Carter (1993, p. 9) takes an analogous stance and counsels that teachers' stories should not be elevated to a 'privileged status' because all reality is a construct. While Anderson and Herr (1999, p. 15) remind us that teacher-researchers do not have 'privileged access to truth', but equally it must be remembered that neither do university researchers.

When teachers do become researchers of their own practice, their research most often takes the form of action research and it is to this that the following section of the chapter turns.

Action research

Action research is the preferred model for teacher research because, according to MacNiff (in McIntosh 2010, p. 37), action researchers 'see knowledge as what they do'. This model of research is, however, 'multi-faceted and may be conceptualized and implemented in a variety of ways', according to Goodnough (2011, p. 74). To establish something of the flavour of action research I begin this section with some definitions from the literature, followed by a short discussion of the diversity of aims of action research, concluding with an overview of the provenance and development of action research including its place in the age of performativity.

Definitions

Stenhouse (1981, p. 103) defines action research as 'a stable, not a fleeting, curiosity, systematic in the sense of being sustained by a strategy'. For Carr and Kemmis (1986, p. 192) action research is a 'process for emancipating practitioners from the often unseen constraints of assumptions, habit, precedent,

coercion and ideology'. McIntosh (2010, p. 53) points to the uniqueness of each inquiry, which is 'reliant on the people's roles in setting the agendas, participating in the data collection, and controlling the use of outcomes'. Willegems et al. (2017, p. 232) draw attention to the collaborative, systematic approach of action research in defining the 'problem, challenge, or question the team wants to address; use of internal and external sources of knowledge; collection, analysis, and interpretation of data from multiple sources before and after the design and implementation of actions'. In NSW, a Professional Learning and Leadership Development Directorate document (2010, p. 1) draws a distinction between academic research, which 'often conjures a picture in people's minds of academics working in isolation for years proving theories', and action research, which is 'one method teachers use for improvement in both their practice and their students' learning outcomes. The central goal of action research is positive educational change.' The document, rather than encouraging teachers to see action research as a means of closing the gap between academic and practitioner research, emphasises this gap and preserves the distinction between the two.

Diversity of aims

Just as constructs of action research differ, so too do its aims. Carr and Kemmis (1986, pp. 202–3), for example, identified three different aims associated with different types of action research: technical action research, which aims to determine the efficacy of other research and to add to that research; practical research, which aims to improve practice; critical research, types of action research with different aims and audiences. Fordham (2016, p. 135) recognised two types of action research with different aims and audiences: teacher research as professional development which emphasises reflective practice and has limited dissemination, and action research for the production of good pedagogical practice with a wider dissemination.

Atkin (1992, p. 381) focused on action research for school improvement and emphasised that 'the research community must elevate the importance of the knowledge that is gained when people inside the system, propelled by their own pressures and aspirations, try to make things better'. Mincu (2015, p. 263) observes that as the school has gained currency as a research institution, teacher professional development through research has been 'actively promoted' as a means to school improvement.

Provenance and development

There are arguments for locating the provenance of action research within a range of perspectives including pragmatism, critical theory, experimentalism and political activism (Eikeland 2012, p. 14). What particularly interests me is that, from its earliest inception, beginning with the work of Lewin in the United States, there is evidence of strong links between action research and pragmatism.

My interest arises from my own preferred research framework located within symbolic interactionism, the immediate antecedents of which can be located both within European interpretive sociology and in American pragmatism. The link between pragmatism and action research, according to Cherryholmes (1992, p. 13), arises from the fact that both action research and pragmatism are driven by consequences. Adelman (1993, p. 12) links action research and pragmatism through the work of Kurt Lewin, whose spiral process is reminiscent of Dewey's observation that education is 'by its nature an endless circle or spiral' (Dewey 1929, p. 77).

There is some debate regarding when action research was adopted as a research methodology for teachers in the United States. For example, Hammersley (1993, p. 425) identifies 'a strong teacher action research movement in the United States in the 1950s'. While Sanford (in Adelman 1993, p. 17) acknowledges that the initial impetus for action research came from the work of Lewin and Corey, it never really got off the ground because 'when federal funding agencies were set up after World War II, action research was already condemned to a sort of orphan's role in social science – for the separation of science and practice was now institutionalised, and it has been basic to the federal bureaucracies ever since'. However, Cochran-Smith and Lytle (1999, p. 18) estimate that there was a strong teacher research movement in the United States in the 1980s and 1990s, aided by the work of Connelly and Clandinin, which focused on teacher knowledge and narrative knowing. A further impetus to the teacher research movement resulted from teachers no longer needing more research 'from university based researchers, but more dialogue with other teachers that would generate theories grounded in practice' (Cochran-Smith and Lytle 1999, p. 15). This was a rejection of 'the authority of experts' and an embracing of what Stenhouse (1985, p. 16) called 'democratizing research'. This rejection or 'rebellion of the public' (Gerhards cited in Pfadenhauer 2006, p. 568) has been experienced by all professions and is associated with the massification of education. These developments led Anderson and Herr (1999, p. 14), also writing in the 1990s, to proclaim: 'We are poised on the threshold of an outpouring of practitioner inquiry that will force important redefinitions of what "counts" as research.' Gold, in the 1990s (in Rowell et al. 2015, p. 244), comments that Lewin was correct in stating that the 'mere trickle [of action research] has become a creek and will become a river'.

In the United Kingdom the implementation of action research in the early 1970s was spurred on, as it was in the United States, by the growing lack of confidence in traditional educational research (Carr 2006, p. 423). However, the approach to action research was different in the United Kingdom in that it embraced interpretive qualitative methodologies, frequently in the form of case studies, which enabled teacher-researchers to test their own tacit understandings. Within this approach Stenhouse, according to Elliott (2001, p. 568), argued that educational research should produce 'actionable evidence' resulting in the accumulation of case studies, as envisaged by Lewin. Elliott (1987, pp. 164–5), who worked with Stenhouse as a member of the Humanities Curriculum

Project, also stressed the collaborative aspect of action research, which would result in the accumulation of case studies. What Dewey, Lewin, Corey and Stenhouse have in common is their plea for research that is designed to find answers to practical questions, conducted with or by the people who are directly involved in the research question and in the situations to be changed (Lunenberg et al. 2007, pp. 13–14).

Kemmis, a former colleague of Elliott, is credited with bringing educational action research to Australia some four years after Rae Munro (1974) began similar work in New Zealand (Adelman 1993, p. 20). In his work with Carr in the 1980s, Kemmis (2009, p. 463) drew on the work of Habermas, positioning action research within the critical, emancipatory tradition and, in which guise, action research 'changes people's practices, their understandings of their practices, and the conditions under which they practice'.

Action research in the age of performativity

Performativity, according to Ball (2003, p. 216), refers to a technology and a culture in which performances are seen as measures of productivity and thus 'encapsulate or represent the worth, quality or value of an individual or organization'. Action research, in the performative, neo-liberal environment of the 21st century, can act as a foil to the 'the misfortunes of imposed modern, undifferentiated and predetermined programmes and approaches' (Ioannidou-Koutselini and Patsalidou 2015, p. 126). These authors believe action research has the potential to change the ethos of the school, to contribute to teachers' self-confidence and to devalue authoritarian knowledge. However, other scholars think somewhat differently and highlight a darker side to action research within the current neo-liberal turn. For instance, Elliott suggested in 1990 that action research has been hijacked by leaders of technocratic reform, who use action research to achieve predetermined curriculum objectives or increase standard assessment scores (in Kincheloe 2003, p. 36). Kemmis (2006, p. 459) similarly points out that action research has not, as expected, been a 'vehicle for educational critique' and indeed some action research has become a 'vehicle for domesticating students and teachers to conventional forms of schooling'. A similar view is expressed by Leat et al. (2015, p. 273), who comment that 'the scope for curriculum imagination has been choked off' and the teacher research movement has now become a captive of outcomes-based education focusing on ways of effectively delivering predetermined knowledge outcomes.

What then of the future for action research? Thomson (2015, p. 309) argues that action researchers 'might be forgiven for thinking that … their moment in the sun had finally arrived'. However, she warns that the 'gold standard for research is the randomised controlled trial' based on 'statistical approaches' and unfortunately teacher research is 'positioned at the bottom of the contemporary methodological hierarchy'. Perhaps more serious is the fact that 'teacher research does not seem to gain a foothold in most schools' (Willegems et al. 2017,

p. 230). This is certainly the situation in Australia, where individual academics within faculties of teacher education work with teachers in a very limited number of schools. However, there has been no recent grassroots action research movement emanating from teachers themselves – nor, I envisage, can there be as long as the traditional construct of teachers' work and associated workplace practices continue unchallenged. The reconstruction of teachers' work to include research will require more than tinkering around the edges of teachers' traditionally defined roles. It requires a rethinking of the institutionalised construction and valuing of knowledge and the concomitant restructuring of institutional roles.

To conclude this section, it is apposite to ponder the following question posed by McIntyre (2005, p. 367):

> Classroom teaching on its own is a very demanding and constraining activity; and academic educational research is, like classroom teaching, a distinctive, demanding, highly skilled and time-consuming activity. So why are already busy teachers being urged to pursue such research?

What concerns McIntyre is that adding research to teachers' current work may take teachers away from 'the fundamental educational purpose that only they can pursue'. However rather than simply add research to teachers' work, I suggest, it is a reconstruction of what constitutes teachers' work that is the way forward.

The Introduction and Chapters 1 and 2 have together provided the backdrop against which the teacher-researchers in the remainder of the book narrate their research journeys. The Introduction set the local and national contexts for the narratives. Chapter 1 examined the epistemological debates surrounding the nature of knowledge and explored the perceived differences between researcher and teacher knowledge. Chapter 2 highlighted aspects of teachers' work and offered an array of scholarly responses to the question: Should teachers be researchers? The chapter concluded with an exploration of the nature and development of action research. It is now time for the teachers to begin their narratives and offer their insights on teacher research.

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3 Answering the action research 'call to adventure'

> I thought action research looked like it would be a worthwhile cause where we could use school time and get relief to be able to create a worthwhile resource that we can use in class, pass on to other teachers and basically make our job more effective.
>
> (Charles)

Introduction

In this chapter we leave the scholarly debates behind and meet the teacher-researchers from Grange High for the first time. They introduce themselves in a round table discussion; this is a textual device, as this discussion did not take place as presented. However, the words are those of the teacher-researchers taken from interviews in which they reflect on the beginning of their action research journey. We learn how they responded to the principal's 'call to adventure' and why they believe they were selected to participate in the action research initiative. Having introduced themselves, the teacher-researchers, through interview extracts and excerpts from their action research reports, identify the classroom issue they selected for investigation and provide the rationale for their choice.

'The call to adventure'

I have borrowed the heading from Joseph Campbell's (1993) classic *The Hero with a Thousand Faces*, likening the principal's invitation to the teachers to that of the traditional hero's call to enter unchartered territory to resolve a problem or an issue. In this section of the chapter the action researchers are meeting for the last time to reflect on the beginning of their research journey. The round table dialogue, whilst it did not take place exactly as portrayed below, nonetheless draws exclusively on the words of teachers taken from reflective interviews which concluded their research commitments. The dialogue is facilitated by Ann, who did in fact conduct the reflective interviews from which the extracts are derived.

Teachers' round table reflection

ANN: Good morning everyone and thank you for taking part in this final action research activity. I would like you all to go back to the beginning and share

with us your reaction when the principal invited you to join the action research initiative. You might also tell us why you think you were asked to participate and why you agreed. Perhaps you could remind us if you had any previous action research experience as a student or pre-service teacher. Charles and Andy, may we begin with you?

ANDY: I'm Andy from the Technology and Applied Studies (TAS) faculty. I've had no previous experience of action research although I think I remember hearing the term at university. I was happy to be asked and pretty keen but a little bit worried about the workload and it did cross my mind to say no for this reason. Don't get me wrong, I was a willing participant because it sounded like a pretty rare opportunity to be able to work on my classroom practice. You see, a lot of the spare time you get in school doesn't necessarily give you a chance to do that because there's a lot of paperwork. Charles and I both saw it as a chance to spend a bit of time on something that we could use daily in our classes.

CHARLES: I'm also from TAS and hadn't done any action research but had a bit of an idea what it was about. Honestly, when the principal asked me I didn't answer straight away because I was concerned about how much time it would take up and I had quite a few other things on my plate. But before this project came up I'd had a conversation with the principal about my aspirations for promotion and I thought that at some stage I could use the action research to advance my career.

ANN: Thank you both for sharing your response with us. You were both obviously keen but a little concerned about the workload. Kathy and Barbara, will you share your recollections with us?

KATHY: I'm from Special Education, and Barbara and I teach students with various levels of intellectual and physical disability. When the principal approached me I was nervous of the unknown, having not done anything like that before. I was really worried about how much work it would be on top of my existing load. I had only just started a new position, so it was sort of something new, on top of something new. I probably felt obligated but thought it was a compliment and it would be silly not to do it. I thought it would be worthwhile just from the professional development side of it and to improve my classroom teaching.

BARBARA: I'm also from Special Education and work with Kathy. I'd probably heard of action research at uni but I didn't really know what it was about. Honestly, it was a bit of shock when the principal asked me; it just came out of nowhere and I did feel that we were expected to participate. I think I almost cried because I was very, very loaded up with new responsibilities at the time and the action research was on top of that.

ANN: Thank you, Kathy and Barbara. You were obviously very busy when you were approached but were nonetheless prepared to participate in the research initiative. Valerie and Lillian, will you take us through your initial responses?

VALERIE: I'm from Creative Arts and was in my first year of teaching when the principal spoke with me. I'd recently done a research project at uni but not action research. I was a little bit scared to be honest because I didn't

really expect to be doing any sort of research after I graduated. You kind of get all of that university stuff out of your head so you can calm down and get into teaching. I enjoy writing but I was sort of hoping to have a small break and to do my accreditation this year and then get into that sort of thing later. It's not that I felt obliged to take part; it wasn't like I felt I couldn't back out so much as I didn't really want to.

LILLIAN: I did my training 30 years ago and don't remember hearing about action research then or since. My first reaction? Goodness me, this is going to be a bit big! For me it was quite academic and I have been removed from that sort of tertiary-level academia for a long time, but I thought it might be really interesting to revisit. I felt, because of our small faculty, that there was no way of opting out. Nobody even thought to say, 'Hey wait a minute I can't do this or I won't do this.' Nobody.

ANN: Thank you, Valerie and Lillian. You certainly had very different teaching experiences to bring to the project. Daphne and Lauren?

DAPHNE: I'm from Personal Development, Health and Physical Education (PDHPE) and work with Lauren. I remember doing a research project at uni 12 years ago but not action research, though I had a rough idea of what action research was about. I was quite excited actually when the principal asked me because I think sometimes you get a little bit stale and it's always good to reflect on your teaching practice and try and improve things and do things better. For me it was an opportunity to reflect on what I am doing and to make sure that I am teaching the kids the best I can. I think if I wanted to say no I could have, but I didn't want to. It's been good to take that step back and actually go, 'So this is what is happening in the educational world.' Sometimes you forget about those things. Also like Charles I thought it would be a good chance for promotion and another notch on my CV.

LAUREN: I felt very chuffed and a bit special when I was asked. I could have said no but I was quite excited about it and I thought it would be good if I wanted to become a head teacher someday.

ANN: Thank you, Daphne and Lauren for sharing your excitement at being asked to join the action research team. Sophie and Nancy, how did you both feel about being approached by the principal?

SOPHIE: I'm from the Maths faculty and haven't been teaching all that long. I also remember doing a research project at uni but not action research. What did I think when the principal asked me? More work on top of trying to teach. I kind of did feel obliged because the other teachers in our faculty all teach senior classes and I only teach junior classes, so my load's not as heavy.

NANCY: I've never come across action research but when the principal talked to me I was keen. I'm always keen to get involved in something that you hope is going to have some effect for everybody. Also I completed a leadership professional development course this year and the principal talked to me about the action research being a good flow on from that.

ANN: Thank you, Sophie and Nancy. To this point no one has had any action research experience. What about Will and Luke?

WILL: Hi. Unlike everyone else I actually did an action research project during my teacher training. I jumped at it when the principal asked me as this is only my second year teaching and it was a pleasure to be acknowledged and invited to join the project. I think being a mature-age new teacher brought an interesting perspective to the whole group.

LUKE: I've been teaching quite a while now and can remember the term action research from university and saw it as a mixture of a practical experiment along with the collecting of academic data. I was interested when the principal approached me but my first reaction was, 'Wow! This is going to be a lot of work!' The principal and I both felt that participating in this project would also enhance my aspirations for promotion, so that is why I decided to do it. There was no obligation and I didn't feel pressured. If I'd said I was too busy the principal would have asked somebody else without any negative reaction.

ANN: Thank you all for sharing your recollections of the first stage of your action research journey and congratulations everyone on completing your action research. I look forward to reading your research.

In the following section of the chapter the teacher-researchers explain their research issue and the reasons why they selected this issue. For easy reference Table 3.1 lists the teacher-researcher action research projects.

Table 3.1 The teacher-researcher action research projects

Teacher-researchers	*Research projects*
Charles and Andy *Technology & Applied Studies (TAS)*	Supporting self-regulated learning using ICT in workshop classes
Kathy and Barbara *Special Education*	Using Web 2.0 technology in a special education classroom
Valerie and Lillian *Creative Arts*	Fostering creativity using smartboards in a visual arts classroom
Daphne and Lauren *Personal Development, Health and Physical Education (PDHPE)*	Achieving academic excellence through teaching skills and content
Sophie and Nancy *Mathematics*	Improving times table automaticity using ICT drill and practice
Luke and Will *Human Society and Its Environment (HSIE)*	Asking good questions in the classroom
Amanda and Helen *English*	Reading for Pleasure Is Reading for Life (Chapter 7)

Our research issue and why we chose it

Each narrative in this section begins with the title of the action research project and the name of the teacher-researchers. This is followed by a short extract from the teacher-researchers' reflective interviews, which in turn is followed by an excerpt from their action research reports.

Supporting self-regulated learning using ICT in workshop classes: Charles and Andy

Interview extract

When laptops were made available in schools we incorporated them into the theory strand of our subject but not into the workshop classes. The action research provided us with an opportunity to improve student use of technology in the workshop situation.

Excerpt from our action research report

Our subject is Industrial Design, which has a theory and workshop component, and one of the challenges we face as teachers is in the workshop component with the diversity of achievement amongst students when they are constructing a project. What tends to happen is that the classes fracture so that there are a few students who are proficient at the front of the class, a middle-range group of students who are working at what could be thought of as a 'normal' pace and there are the students who fall behind. As well there are the kids who are absent. After the teacher's initial presentation the class spreads out into the workshop and the teacher is involved in doing a lot of demonstrations that are only relevant to maybe one-quarter of the class. At the same time there may be as many as 15 other students who have to be controlled or kept interested. It is then difficult for the teacher to provide efficient and individualised instruction for all students.

We chose our issue in order to investigate how we can overcome these challenges through the use of videos. Our aim was to provide a resource to students who need extra assistance, keeping them up-to-date and engaged with their learning. These videos were intended to provide short, detailed tutorials catering exactly to the particular stage of the activity that the students were undertaking. We anticipated that this would lead to improvement in students' engagement, build students' self-efficacy and reduce students' dependence on the teacher. We also anticipated that the use of videos would cut down on idle time as students would no longer have to wait for instruction from the teacher.

Using Web 2.0 technology in a special education classroom: Kathy and Barbara

Interview extract

We work with students with a range of disabilities and quickly nailed the issue because we've noticed that our students respond really well to technology and we have both had technology training in our faculty.

Excerpt from our action research report

Our aim was to study the benefits of using Web 2.0 technology in a special education class. Students already use technology in their lives and as these devices retain students' attention we thought they would be a valid tool for classroom learning. We had observed that many of our students with autism spectrum disorders had a preference for screen-based technology because they find face-to-face interaction overwhelming. We also know that students in a special education setting value the means of expressing personal identity, just as do other students, and in the past they have achieved this through, for example, individualising book covers. Now this is expressed by creating personal profiles on websites such as Facebook and, in the classroom context, Edmodo. Through our research we hope that the use of Web 2.0 technology will prove a useful tool for increasing our students' skills and motivation and foster diverse learning experiences that are more engaging, personalised and social.

Fostering creativity using smartboards in a visual arts classroom: Valerie and Lillian

Interview extract

Neither of us has had very much experience with digital pedagogy such as using interactive whiteboards, and we found the newly installed smartboards in our classrooms very intimidating to use in front of students who have all used them in primary school. The action research project gave us the opportunity to build on our limited knowledge and to take some time out and actually read how other people have used smartboards.

Excerpt from our action research report

Our research arose because with the increased prevalence of interactive whiteboards in public schools in Australia there has been a shift towards using this technology for meaningful learning experiences, not just for its motivational aspects. Every classroom at Grange now has an interactive smartboard and the

school has focused on training staff in the use of this technology during professional development days. The school also has the benefit of a Leader of Digital Pedagogy to help staff and students use new technology effectively.

With the shift away from traditional media toward visual technologies, students will increasingly be interfacing with technology where they need to be visually literate. To participate, they will need not only to be able to read visual symbols but to interpret them. To better equip our students with the skills we believe are necessary for future learning and employment, we focused on exploring student design and invention through the creative use of the smartboard. We believe that the skills the students learn when interacting with technology will empower them to make a smooth transition into the increasingly technology-based workplace. We understand that interactive whiteboards will eventually be superseded by other technology, but the skill set that students possess may form the base set of skills for any new technology.

Achieving academic excellence through teaching skills and content: Daphne and Lauren

Interview extract

We chose to do our research within a Higher School Certificate (HSC) class. Coinciding with the action research initiative we had probably one of the brightest classes we have ever had and it was a good opportunity to reflect on our senior programmes and to think about how we engage these kids. We observed over our years of teaching at Grange High that a lot of kids are just happy with a Band 3 and 4[1] in the HSC and that many of these students were only one or two marks away from a higher band. They think that's OK. With the current class, we wanted students to aim for academic excellence, that is, Band 6. We were not aiming to have just a few high achievers; we wanted to bring the middle and the lower end up. We wanted all our students to achieve their academic potential.

Excerpt from our action research report

We teach Personal Development, Health and Physical Education (PDHPE) and as teachers we are judged on our HSC results by students, parents, the principal, the community and our work colleagues, who consider that the HSC results indicate if the teachers' learning and teaching practices have been effective. With this in mind we decided that our action research project would focus on enhancing the academic achievement of our senior students. We accept that as a teacher it is important to continually evaluate teaching practices. This led us to ask the questions: Are we focusing too much on content? Do we allow time to develop the skills of knowledge application in our students? We hypothesised that perhaps we are too engaged in delivering content due to time constraints and we do not spend sufficient time developing skills.

We aimed to discover if teaching skills and content are of equal importance in achieving academic excellence. Our students are sitting a HSC subject and they do not know how to analyse questions; they do not understand how the syllabus relates to exam questions, and those skills are as important as knowing the content. If students do not know which syllabus point goes with which question then they will never access the higher bands. Our research aim was to develop a quality learning environment in which 75% of students would: improve their academic results from the mid-year exam to the preliminary exam;[2] achieve a meaningful and deep understanding of content; and apply higher-order thinking skills. If we could achieve these aims, we hoped to encourage students to believe in themselves and be more confident in applying content knowledge.

Improving times table automaticity using ICT drill and practice: Sophie and Nancy

Interview extract

Our issue arose out of discussions with other teachers in the Maths faculty. All agreed that many students do not know their basic times tables and this affects their overall learning and self-confidence in Maths. The faculty agreed that students need to drill and rote-learn basic concepts in order to move forward and have any success in Maths. We believe that the ability to quickly recall simple arithmetic makes for a much more confident and successful Maths student.

Excerpt from our action research report

There were a number of reasons for investigating times table automaticity through ICT. First, our school is fully equipped with computers, smartboards and technological support and these resources should be used in a positive way to improve teaching and student outcomes. Second, many of our students do not have the ability to quickly recall simple multiplication tables. This affects their overall results as their focus tends to be on basic mathematics rather than on advanced tasks. Students have been observed to lose motivation and engagement when they cannot recall times tables and further learning is not attempted.

The decision to centre our project on drill and practice through the Internet and mathematical games was based on our observation that technology is so often distracting our students from traditional forms of teaching. We decided to try and reverse this trend by using technology as a quality tool in the mathematics classroom. Also, students are accustomed to receiving information through multi-sensory stimulation. Other members of our faculty agreed that students were much more focused and motivated when given mathematical tasks or games to complete on the computer. This led us to explore the Internet for drill and practice of times tables resources. We chose to investigate if this style of learning could help our students with their skills, improve engagement, automaticity and confidence.

Asking good questions in the classroom: Will and Luke

Interview extract

In selecting our research issue we aimed to do something that was actually going to be of practical use for teachers. We weren't interested in doing a purely academic issue. We wanted to do something to help teachers in the classroom.

Excerpt from our action research report

Through this research on asking good questions we aim to provide the school with a practical and contextualised product. We will do this by producing a Higher-Order Thinking (HOT) questioning rubric based on research-based taxonomies of question sequences. This document will, we hope, be capable of supporting teachers in all faculties to improve their ability to ask students good questions. Teachers' deep understanding of asking good questions and the implementation of good questions into classroom practice, we believe, fosters in students levels of higher-order thinking and improves student engagement.

Summing up

Emotive responses predominate in the teacher-researchers' retelling of their initial reactions to the action research challenge as they recount being 'keen', 'excited' and 'chuffed' but at the same time 'worried', 'nervous' and in 'shock' as they recognised that participation in action research would increase their already full workload. All of the teachers were unprepared for the inclusion of research into their daily work as teachers. The invitation was, however, largely received as a 'compliment', with teacher-researchers finding 'pleasure in being recognised' and seeing action research as 'an opportunity' to improve pedagogical practices, student outcomes and to enhance their career prospects; similar teacher motivations were noted by Noffke (in McLaughlin 2004, p. 129). Whilst the literature (Lortie in Etzioni 1969; Anderson and Herr 1999; Gore and Gitlin 2004) generally agrees that that there are no extrinsic rewards for teachers to engage in research, nonetheless, the teacher-researchers at Grange did perceive rewards in terms of improved practice and the associated improvement in student outcomes as well as their own possible career advancement.

The introductory chapter of the book explored the local and national contexts within which the action research was embedded and the significance of this dual context can be seen in the teacher-researchers' choice of issues to research. With respect to the national context, Grange and all other state schools in Australia benefited from the Labor government's 'digital revolution', which saw the distribution of laptops, 'the tool-box of the twenty-first century' (Rudd et al. 2007, p. 1) to all Year 9 students. The speed with which this distribution occurred left many teachers at Grange unprepared for the integration of laptops

and other new technologies into their pedagogical practices. Teachers did, however, recognise 'teaching is changing, end of story' (Scanlon 2015, p. 99) and it was this recognition which appears to have precipitated many of the research teams to focus on technology.

Technological innovations can be challenging for teachers and Cuban et al. (2001) found that teachers tend to domesticate technology to suit their teacher-directed practices (Scanlon 2015, p. 99). However, something different happened at Grange in that the teacher-researchers who elected to position their research within new technologies continued with or adopted student-centred pedagogical practices to better suit the new technologies. We can see this in the research of Andy and Charles, Valerie and Lillian, Kathy and Barbara and Sophie and Natalie, all of whom employed technology within student-centred pedagogies which aimed to increase student self-efficacy, independence, engagement, social skills and motivation. At the same time Andy and Charles, Valerie and Lillian and Kathy and Barbara saw the action research as an opportunity for the enhancement of their own technological skills.

The other national policies from which Grange as a low socioeconomic school benefited through increased funding were the *National Partnerships on Low SES School Communities* (2009) and the *Improving Literacy and Numeracy Project* (ILNP) (2013–2014). This was an opportunity for Amanda and Helen, whose longitudinal narrative of their action research is told in Chapter 7, to focus on reading to improve overall student literacy and for Sophie and Nancy to improve basic arithmetical skills. An associated literacy issue was investigated by Daphne and Lauren, who focused on examination literacy, and Kathy and Barbara, who combined social literacy with technological literacy in a special education class.

While the research at Grange was situated within a broader policy context, and in many instances reflected current policy, there is no evidence that the action research at Grange was hijacked by policy, something both Elliott (in Kincheloe 2003, p. 36) and Leat et al. (2015, p. 273) believe has occurred. Rather, at Grange, policy and the principal's enactment of policy provided the funds to enable the action research to take place.

Not only were the research issues situated within the national and local contexts of the teacher-researchers' work, but it is evident that the Grange teachers had already identified problematic learning and teaching issues within their everyday practice and these became their research issues. The process of selecting an appropriate issue for research at Grange was very different from that encountered by Adelman (1993, p. 18), who found in his work with teachers that there was 'between a week to 3–4 months of awkward talking around anecdotes and images trying to locate key actions and acceptable terminology'. This was not the situation at Grange where, from the introductory workshop, teachers identified their area of interest, which took little more than a few weeks to refine into a researchable issue. It was evident, as Hampton (1993, p. 260) recognised, that the problems identified by the teacher-researchers were part of their lived experience and the 'practical questions that fit in with the working conditions of professionals'

(Bartlett and Burton 2006, p. 397), or as Goodnough (2011, p. 83) suggests, focused on student learning that is 'job-based and practice-based', thus enhancing teacher agency.

We now leave this first waystation on the teacher-researchers' journey. The research challenge has been accepted and a research issue decided upon. What follows is the preparatory stage of the journey in which the teacher-researchers are inducted into research conventions in training workshops and engage in reading the literature on their chosen research issue.

Notes

1 HSC bands downloaded from www.boardofstudies.nsw.edu.au/hsc-results/understanding.html, 17 April 2017

- Band 6 = 90–100 marks
- Band 5 = 80–89 marks
- Band 4 = 70–79 marks
- Band 3 = 60–69 marks
- Band 2 = 50–59 marks
- Band 1 = 0–49 marks

Each band is aligned to what a student at that level of performance typically knows, understands and can do. The 'average' performance in most courses is usually a mark in the mid-70s (Band 4). Band 1 indicates that a student has not met enough of the course outcomes for a report to be made.

2 The preliminary examination focuses on introductory subject material not included in the final HSC examination.

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4 Preparing for the research journey

> I found reading the literature very difficult; I've never read so much in my life. I haven't done anything like that since uni, and uni was a long time ago. I found it hard to get back into the swing of it, but once I did I enjoyed it immensely.
>
> (Lauren)

Introduction

The teacher-researchers have reached the preparatory waystation on their action research journey. In the first section of the chapter I briefly step into the narrative and draw on extracts from teacher-researcher interviews to explore their responses to the research training workshops and the accompanying research guide – their research Baedeker. The teacher-researchers then resume the narrative, exploring their engagement with the research literature, recounting the difficulties of gaining access to the scholarly literature and of deciphering the academic discourse in which education research is reported. These narratives begin with an interview extract in which each of the research partners recalls their individual engagement with the literature review process, followed by the collective rending of this process in an excerpt from the literature review section of their action research reports.

Research training workshops

In the reflective interviews with the research assistant, the teacher-researchers were asked to comment on the role of the research training workshops and the research guide in introducing and supporting them in their action research projects. This comment by Charles is representative of their responses: 'The workshops were very helpful, especially not knowing a great deal about action research; we really needed that clarification before jumping in and getting started.' Andy found the workshops made action research 'less daunting' so that 'by the end of the workshop we were pretty positive'. Lillian remarked that the workshops were 'reassuring and set the pace for the research and gave the guidelines and a timetable and set out expectations. I was much more comfortable after the workshop.'

> They were excellent. During the first workshop all the excitement sort of kicked in and we understood where we were headed with our research

> project. At the start of the day we had lots of things racing around in our head, but by the end of the day we were very focused, very determined and very motivated. It was also really good to hear the other faculties throwing in their suggestions to us.
>
> (Lauren)

It was not only the content of the workshops that the teacher-researchers found helpful but the opportunity to share ideas with colleagues away from the demands and distractions of the school day. Daphne remarked, 'We were able to absorb all of the information in a relaxed atmosphere because there was no time pressure; it wasn't using up our own time.' The collaborative aspect was particularly important for Will, who was new to teaching and to the school:

> The workshops were a good bonding exercise in that there was a sense of a group exercise rather than just faculties working on their own. I have actually connected with a lot of the other teachers through the action research and developed a lot more rapport with them and an understanding of different programmes in our school.

The teacher-researchers also commented on the research guide developed for the workshops. This guide was used by each team in different ways to suit their research needs and their knowledge of action research. For example, Andy, like many of the teacher-researchers, relied on the guide throughout the research process: 'We've gone back to the guide and looked at it frequently, because on long projects you can lose your way a bit and it kept us on track.' Valerie said she referred to it 'constantly, constantly. I had it taped on my desk next to my computer when I was working on the research.' Daphne said, 'We referred back to the booklet quite a bit throughout the process.' Charles found that his partner Will, who was familiar with action research, did not often refer to the guide, however, because 'action research was new to me the guide helped cement in my own mind the process that we had to set out on paper'. For Kathy it was 'a skeleton, a framework to get us started'.

Following the workshop induction into action research the teacher-researchers engaged in a search for research literature relevant to their issue. The narratives below begin with extracts from the teacher-researcher interviews in which they individually recount the different aspects of their literature searches. This is followed by excerpts from the formal literature review from the action research reports.

Supporting self-regulated learning using ICT in workshop classes: Charles and Andy

Interview extracts

CHARLES: To be totally honest I haven't read educational resources since university. Once I started the research I got interested because you sort of get back into that study mode again. I wouldn't have gone and got a book out and started

reading off my own bat, but because I'm doing the action research I had to and once I started it was quite interesting and it made me reflect on my own practices, so it was a very good experience. Andy and I divided up the reading, Andy looked at the use of ICT stuff in the classroom and I looked at self-regulated learning.

ANDY: I read the literature review example from the workshop guide and that got me back in that mindset of what it is to read academic papers. I was lucky enough to use another teachers' university logon to access the things I wanted because without a university password it certainly would have been a lot harder to access information. I also spent a fair bit of time on the Internet where there's tons of stuff by teachers on how they teach or how they use technology but for the literature review in the action research report we mostly used journal articles.

Excerpt from our action research report

We did some reading on action research and found that action research 'is research that is carried out by practitioners on their own practice, not (as in other forms of research) done by someone on somebody else's practice. Action research in education is grounded in the working lives of teachers, as they experience them' (Waters-Adams 2006, p. 3). We found this quote summed up our approach to research, which is about us as teaching practitioners trying to better understand and improve our own teaching practice. We believe that action research will enable us to carry out qualitative research to explore the use of teacher-created instructional videos as a viable teaching medium to engage students in practical projects.

Today we are teaching the generation born in the 1990s, which Rosen (2011, p. 12) calls the 'iGeneration'. 'The "i" represents both the type of digital technology popular with children and adolescents (iPhone, iPod, Wii) and the highly individualised activities that these technologies make possible. Today young people are defined by their technology and media use, their love of electronic communication and their need to multi-skill.' Kuntz (2012, p. 1) supports this view, arguing that, for students, technology is not just surfing the Internet, it is about 'smart-phones, instant-messaging, music, videos, and social networking, personal and mobile technology is ingrained in youth culture. It's important to young people, it's part of their identity, and it's not going away.' We found this research supportive of our idea that technology, instead of being a distraction for students, could be better used to engage them in learning.

Teachers must be aware of the pros and cons of the technology available; for example, easy access to videos through the Internet has meant new ways of instruction are open to teachers. Teachers are now able to create context-rich video presentations that provide 'stimulating meaningful real-world situations, problems or contexts' (Karppinen 2005, p. 241). These video presentations enable students to determine the pace at which they learn as they can control the video to suit their cognitive ability. When students do not have control and

the pace of learning is mismatched to their working memory, cognitive overload occurs (Merkt et al. 2011, p. 689). Because workshop classes in Industrial Design fracture into groups of different abilities, levels of engagement and stages in the construction of projects, we reasoned that videos would allow for self-paced learning and save students from waiting for the teacher to attend to their needs and thereby encourage them in self-directed learning.

We found the idea of self-regulated learning (SRL) useful for our research as this consists of a succession of stages and phases. Lennon (in Vavrova et al. 2012, pp. 333–34) says what is common to all SRL theories, that is, that self-regulation has a motivational component. However, as SRL requires effort, time and vigilance, this means a student must be motivated in some way before SRL can take place. Students ready for SRL, rather than give up on tasks which are challenging, persist in believing that with effort and effective strategic use success is within reach and within their control (Schuck and Zimmerman 2011).

Using Web 2.0 technology in a special education classroom: Kathy and Barbara

Interview extracts

KATHY: We had a day where we used the Internet to find relevant information on the use of Edmodo, a networking app used in schools. This information was very easily accessed on the Internet. However, gaining access to research journals was very frustrating because neither of us had a university password. A colleague who was going to uni came to the rescue and allowed us to use her password.

BARBARA: Getting access was a bit of a pain actually and a very frustrating aspect of the action research. In the end we listed the articles we wanted to read and a colleague who's at uni download and printed them for us.

Excerpt from our action research report

Today's students are digitally literate and think visually in non-linear ways, practise multi-skilling and give preference to multimedia environments (Pedro 2006, p. 10). Students with autism spectrum disorders (ASD) demonstrate a strong preference for screen-based technology because they face significant social and emotional difficulties because they find face-to-face interaction confronting, over-stimulating and anxiety-provoking (Mazurek 2013, p. 1709).

In our combined experience of working with students with disabilities we have witnessed first-hand the difficulties these students encounter with face-to-face communication. It was this observation which led to our current research issue. ASD students also have the tendency to engage in repetitive and restricted interests and behaviours. This suggests that social media may provide a less threatening social venue for them. Yan Yu et al. (2010) point out that social

networking in educational contexts may improve academic achievement by creating a learning environment which is more comfortable for students with autism than off-line interactions. On-line environments provide an alternate channel for students to express feelings and establish friendships and this is important for students' health and performance improvement.

Entering the popular culture of teenagers by using Web 2.0 extends the reach of teachers beyond traditional teaching methods (Maranto and Barton 2010, p. 43). The writers mention Reich's four essential 21st-century skills: abstraction, system thinking, experimentation and collaboration – the same four skills used by Edmodo and other social networking sites such as Facebook which allow students to select from menus and enter keywords to create a virtual identity. Students learn about the Facebook system, discovering how they connect to others in a giant web of shared interests. We hope that students will not only benefit from using technology as a learning tool in the classroom but that technology will enhance their social skills, broaden their interests and encourage them to allow others into their world.

Redecker et al. (2009, p. 40) suggest that Web 2.0 tools support the learner's sense of ownership of the content, which in turn encourages motivation. The authors also believe that learning with Web 2.0 allows for the implementation of learning strategies that are tailored to each learner's individual preference, interests and needs and provides a learning environment better suited to individual differences. 'Teachers become designers, coordinators, moderators, mediators and mentors, rather than instructors or lecturers, whereas students not only have to take responsibility for their own learning progress, but also have to support each other in their learning endeavours, and jointly create the learning content and context' (Redecker et al. 2009, p. 10). Students rather than being passive recipients, we hope, will become more active learners through the use of technology.

Buescher (2010) says that Edmodo is applicable to a range of grades and curriculums as it provides a means of gaining and advancing skills used across all content areas. Also, Edmodo encourages students to learn and apply a range of skills, such as, making textual, personal and worldly connections, drawing inferences, understanding and formatting responses based on a particular audience, posing literary discussion questions based on critical-thinking and working in a collaborative environment with other students.

Fostering creativity using smartboards in a visual arts classroom: Valerie and Lillian

Interview extracts

VALERIE: I still have friends at uni and without their passwords we wouldn't have been able to access online journal articles. It would be great if schools had access to an online database similar to that of the university. We read articles on technology specifically to do with smartboards. We couldn't find

many articles about Australian schools, so most came from the United Kingdom and New Zealand. We also read articles on collaborative artworks and the different forms of collaboration and what they mean for learning and creativity.

LILLIAN: We used the Internet to access New Zealand and United Kingdom research as well as some articles from Canada and the United States. There was very little literature on the smartboard or the interactive whiteboard for visual arts. I must say the reading was quite wide, and we divided up a lot of what we had to do.

Excerpt from our action research report

The research literature supports the use of interactive whiteboards to actively engage students in learning. Kitchen (2010, p. 2) states that 'interactive whiteboards support visual, auditory and kinaesthetic learning' and that the best 'learning experiences for most students are derived when they are actively engaged in design and invention not just interaction'. Passey et al. (2004) noted decreased levels of performance avoidance when interactive whiteboards were used in the classroom, allowing for a creative and collaborative environment. Winzenriad et al. (2010, p. 536) believe there are three benefits of whiteboards: increase in student engagement; more effective visual representation; and learning through greater classroom interactivity. The physicality of the interactive whiteboard is appealing to visual and kinaesthetic learners (Cuthell 2003). The research indicated to us that with practice we could incorporate the smartboard into our student-centred teaching to enhance its use as a creative art tool.

Chuang et al. (in Winzenriad et al. 2010, p. 536) thinks that the learning benefits of the interactive whiteboard are dependent on students interacting directly with the whiteboard rather than observing the teacher using the whiteboard. Students can interact effectively because the whiteboard is big and visible (Koenraad 2008, p. 10). An advantage of the interactive whiteboards for the teacher is that they can be used without an initial big shift in pedagogy (Winzenriad et al. 2010, p. 534). We found this reassuring because of the time we had to spend on learning the basics of the smartboard and then learning how to use it to enhance creativity in art.

We also looked at literature on collaborative learning using the smartboard. Collaborative learning is effective because 'all participants possess stable knowledge chunks and are able to compensate and develop the areas of those who lack a missing link in that direction, thus individuals contribute to each other's development. In this case, teacher and students are at the same level of participation' (Turcsány-Szabó and Kalas 2005, p. 56). We explored different kinds of collaborative learning with technology and found recommendations for the use of a single screen in the classroom (Department of Education and Training 2003a) and students working in small groups using personal screens (Turcsány-Szabó and Kalas 2005). For our project we decided that students would first work on their laptops and then on the smartboard. The smartboard offers shared

learning experiences with computer images displayed via a digital projector. These images can be controlled through the computer and the smartboard screen. When students work on a shared task to achieve a common outcome, this kind of group work is called knowledge-building. This results in unstructured group interaction where each student contributes to the knowledge-building process (Strijbos 2000). This is what we wanted to achieve in our classrooms through our research project.

As well as reading articles on the interactive whiteboard we also looked at the *Quality Teaching Framework* (QTF),[1] particularly the aspect of Intellectual Quality which emphasises that pedagogy should produce in students a deep understanding of important concepts, skills and ideas. Such a pedagogy treats knowledge as actively constructed, requiring students to engage in higher-order thinking and communicate substantively about what they have learned. The QTF also emphasises the need for high expectations and the development of positive relationships between teachers and students (Department of Education and Training 2003a, p. 5). These aspects of QTF further support our readings on creativity and collaboration.

Achieving academic excellence through teaching skills and content: Daphne and Lauren

Interview extracts

DAPHNE: We focused on three different areas in our reading. The first was the Accelerated Learning Model, which is a big thing in the UK. I taught in the UK and they are probably a little bit more advanced than Australia in terms of their initiatives in education and they are a lot more focused on skills. The second was the *Quality Teaching Framework* (QTF) because this is really important in our school. The third was collaboration among learners. There were a lot of pretty cool YouTube clips on the Accelerated Learning Model. To access journal articles one of the teachers who is at uni helped us out a lot.

LAUREN: We used three different models, the *Quality Teaching Framework* (QTF), accelerated learning and the 21st-century learner. I reviewed a lot of information about these three models and linked them with our action research. I found it very difficult to read at first but once I got into it I enjoyed it.

Excerpt from our action research report

The literature review focuses on how teaching both skills and content can achieve deeper student understanding. We explored the Accelerated Learning Model (ALM) developed by Rose (Meirer 2011) and in our research we focused on three areas of this model. In the first, students take responsibility for their learning, so this is an activity-based not material-based or presentation-based approach. The second is collaboration because all good learning is social. The

third is learning in real-world situations with feedback, reflection, evaluation and immersion. Using elements of the ALM, we anticipate, will support our aim of assisting our senior students achieve academic excellence.

We have had previous experience with the *Quality Teaching Framework* (QTF) through school-based professional development and believe that this model can support our research aims. This framework (Department of Education and Training 2003b, p. 9) identifies three dimensions of pedagogy linked with improved student learning: intellectual quality, which focuses on deep understanding of important, substantive concepts, skills and ideas; a classroom where students and teachers work productively in an environment focused on learning and in which there are high and explicit expectations; and significance, which entails drawing connections with students' prior knowledge and identities, with contexts outside the classroom and with multiple ways of knowing.

Each of these three dimensions has a number of elements and our research found the following relevant to our project: the knowledge being addressed is focused on a small number of key concepts and ideas within topics, subjects or KLAs, and on the relationships between and among concepts; higher-order thinking where students are regularly engaged in thinking that requires them to organise, reorganise, apply, analyse, synthesise and evaluate knowledge and information; lessons explicitly name and analyse knowledge as a specialist language (metalanguage), and provide frequent commentary on language use and the various contexts of differing language uses and explicit quality criteria; students are provided with explicit criteria for the quality of work they are to produce and those criteria are a regular reference point for the development and assessment of student work (Department of Education and Training 2003b, pp. 11–12). These elements have been incorporated into our research strategy and the skill-based lessons which are the focus of our research.

Improving times table automaticity using ICT drill and practice: Sophie and Nancy

Interview extracts

SOPHIE: We looked at the use of technology in the classroom because we wanted to incorporate games and technology to get the kids involved in and keen about maths. We didn't want to be smashing them with paper drill, we wanted it to be exciting. I don't think we had problems finding stuff because we had someone in the faculty who still attends uni so we were able to access the library for journals and books.

NANCY: I am fairly new to teaching and when I was a student we learnt times tables by rote but today students come into high school and don't know their times tables. When we were looking for articles and saw the research out there, and even action research projects on the issue of automaticity, it was reassuring that automaticity is a concern for other teachers. We mostly used articles from the United States but there was some research in Australia.

Excerpt from our action research report

There have been many changes in the teaching of mathematical concepts over time and drill and practice have appeared cyclically as recommendations for teaching basic mathematics such as times tables. However, recently there has been a focus on developing children's conceptual understanding of mathematics through a problem solving approach with less time on practising routine number skills. This was the emphasis we both recall from our teacher preparation courses. Other strategies have focused on recall of number facts and on the ability to calculate quickly and accurately (Westwood 2000). Since 2000 in Australia, Westwood points out, there have been new publications with a focus on improving students' numeracy skills and achieving an effective balance between problem-based teaching methods and essential practice in basic processes.

An advantage of drill and practice is its adaptability for students with learning difficulties. 'It is likely that teachers who support students with learning difficulties will still consider regular intensive drill to be one indispensable tactic for helping students gain long-term mastery over basic skills' (Westwood 2003, p. 18). However, Westwood thinks that drill may be less effective for higher-ability students and that learning and teaching should be differentiated according to students' individual learning needs.

Research on multiplication has shown that students as low as the third grade rely heavily on memory (Koshmider and Ashcraft 1991, p. 56). This line of research indicates drill and practice to enhance memory may be appropriate from third grade to adulthood. Information-processing theory is yet another dimension of research that supports the view that automaticity in mathematics is fundamental to success in many areas of higher mathematics. Without the ability to retrieve facts directly or automatically, students are likely to experience a high cognitive load as they perform a range of complex tasks. The added processing demands resulting from inefficient methods such as counting, that is, direct retrieval, often lead to declarative and procedural errors (Cumming and Elkins 1999, p. 150).

In our reading we also looked at precision teaching, which is not so much a teaching method as a system for closely monitoring the effects of any teaching method. It has strong applications within the field of remedial teaching but can also be applied across the curriculum in areas where skill building, automaticity or increased work output are required. Precision teaching employs a recording method which measures the rate at which a student improves and this gives the teacher information to help refine the teaching method or to adjust the curriculum materials (Westwood 2006). Research has shown that precision teaching has consistently reported higher student achievement than is usually obtained by traditional instructional methods in basic skills (Westwood 2006, p. 20). Incorporating technologically supported drill in our research will also provide us with computer-generated data to enable us to track students' progress and determine the effectiveness of computer-assisted drill and practice to enhance automaticity.

Mastery learning is another concept we explored as a useful teaching tool as it enables all students to reach required standards. Other forms of teaching take students at a standard pace through the curriculum even when they have not mastered concepts (Westwood 2006). The advantages of mastery learning are that learners are provided with clear and logical tasks and receive frequent feedback and correction. Mastery learning can break into the failure cycle by helping lower-ability students experience more success. This approach we believe will particularly suit our students who have low levels of literacy.

It would seem, therefore, that creating an environment where students are able to practise multiplication, get immediate feedback, compete against themselves, work at their own pace with appropriate technology should lead to improved academic results. Thus the question for our action research is: Can we improve automaticity of times tables for Year 8 students using computer technology and drill and practice techniques?

Asking good questions in the classroom: Will and Luke

Interview extracts

WILL: I took on the literature research. There is actually quite a lot of literature on asking good questions, a lot of stuff on taxonomies. We found that the research showed that teachers very, very rarely ask more than four questions in a sequence on a topic, or very few in-depth questions and few questions which ask students for analysis, evaluation or synthesis.

LUKE: I just read the quality teaching stuff. Will and I had an agreement that he would do the readings, the academic side of it. I was going to do the practical application of it.

Excerpt from our action research report

In this review we rely on the work of Vogler (2005, 2008), who provides an overview of the research findings on questioning taxonomies and sequencing. According to Vogler (2008, para. 1), questioning is second only to lecturing as the most common form of instructional practice. Research shows that on average teachers ask about 300–400 questions per day and in many cases up to 120 questions per hour. Even though teachers ask this many questions, and know that questioning helps students learn, many teachers lack knowledge about questioning taxonomies and sequencing (Vogler 2005, p. 98). Verbal questioning should do more to create a context for exploring ideas and enhancing students' knowledge (Vogler 2008, para. 2). It is for this reason that we have adopted suggestions from the literature regarding the way questions can be sequenced to construct our Higher-Order Thinking rubric.

Wilen (2001) and Tienken et al. (2009) suggest that teachers can, with practice and understanding of the concepts involved, improve their ability to ask questions specifically aimed at higher cognitive levels. It is possible for

teachers to become familiar with question sequencing. Vogler (2005, pp. 99–100) suggests the following question sequences as a guide for teachers: a) extending and lifting – asking a number of questions at the same cognitive level or extending before lifting the level of question to a higher level; b) circular path – questions that lead back to re-examine the initial position or question; c) same path – questions at the same level; d) narrow and broad – lower-level specific questions followed by higher-level general questions; e) broad and narrow – low-level, general questions followed by higher-level specific questions; f) backbone questions with relevant digressions, focusing not on cognitive level but how closely they relate to the theme, issue or subject.

Another taxonomy is that of Bloom, revised by Krathwohl (2002, p. 215), which has a sequence including remembering, understanding, applying, analysing, evaluating and creating. Gallagher and Ascher (in Vogler 2005, p. 99) also built on the work of Bloom, identifying the following sequence of questions: a) cognitive memory questions which rely on simple processes like recognition, rote memory, selective recall; b) convergent thinking, which requires analysing and integrating data to formulate an answer (one correct answer at this level); c) divergent thinking, which requires a response independently generated or a new perspective given; and d) evaluative thinking, which is the highest question level, deals with matters of judgement, value and choice.

These different questioning sequences form the epistemological basis for the HOT (Higher-Order Thinking) questions rubric which we have developed from our research. We also included the *Quality Teaching Framework* in our reading and believe that proper sequencing of questions has the capacity to support a quality learning environment and enhance student understanding of concepts and ideas. Good questions, we anticipate, will encourage students' active participation in knowledge building.

Summing up

Overall the teacher-researchers found the research training workshops and the research Baedeker informative guides on their action research journey. Just as important as the induction into research was the collegiality of the workshops, which enabled a cross-faculty exchange of ideas, something difficult to achieve in secondary schools and new for the Grange teacher-researchers. The reflections on the research training workshops indicate the readiness with which the teacher-researchers embraced the action research framework. Perhaps, as Carr and Kemmis (1986, p. 41) observe, action research is a process which rings true to teachers because they see that its processes can easily be incorporated into their own routines. Also, the action research project presented the teacher-researchers with the opportunity to systematically research issues which they had already identified within their classrooms as in need of change and improvement.

The importance of a literature review in action research was emphasised in the research training workshops and is generally recommended in standard action research texts such as Koshy (2010) and McNiff and Whitehead (2005).

However, a review of the literature is not always seen as an essential component of action research (Cain et al. 2007, p. 103). My view, and one I propounded in the training workshops, is that if teachers are to gain a voice in educational debates then a critical first step is being aware of the nature of those debates and of the scholars who take part in them. When engaged in action research, this can only be attained by conducting a review of the literature on the issue under investigation.

The literature review excerpts indicate that the teacher-researchers read three types of texts, namely, policy, theoretical and pedagogical. The most commonly referenced policy text was the *Quality Teaching Framework*, which, according to the endnote in this chapter, 'is incorporated in all teaching and learning programs' in NSW schools and was given particular emphasis at Grange, which explains why it was so frequently cited by the teacher-researchers. The theoretical texts are represented by the teacher-researchers' readings on a range of learning and teaching issues such as self-directed learning, collaborative learning, questioning taxonomies, creativity, mastery learning, adolescent learning, learners with disabilities, ICT and accelerated learning. The pedagogical texts focused on the application of learning theories and on teaching practicalities, such as the use of smartboards, videos, laptops and Edmodo.

There were two difficulties encountered by the teacher-researchers in locating and reviewing the research literature. The first was gaining access to the literature. Research articles are available, mostly on-line, to the students and staff of universities, and the teacher-researchers at Grange, with only one exception, were in neither of these categories. This difficulty in accessing educational research articles is a reminder that academics write for each other (Hargreaves 1996, p. 6), not for teachers. The teacher-researchers were reliant upon the cooperation of their non-researching colleagues who were studying at university to provide them with library access. In all instances their colleagues were particularly supportive, providing the teacher-researchers with either library catalogue passwords or themselves obtaining research articles for the teacher-researchers. Leat et al. (2015, p. 271) refer to an Australian study which characterises teachers who access research as those who 'observe and question their own practice; have an eye for the bigger picture of educational change; have a moral purpose for their work; and continually ask probing questions'. What this report does not acknowledge is how these questioning teachers might gain access to this literature.

The second difficulty associated with the literature review was the teacher-researchers 'getting back into the swing' of reading academic research. In Chapter 1, Zeichner (1995, p. 155) refers to the specialised language used by researchers which renders a great deal of research writing only accessible to 'particular sub communities of academic researchers'. This then is another obstacle that renders educational research beyond the remit of classroom teachers. Only one of the teacher-researchers had engaged with research literature since leaving university; however, the Grange teacher-researchers did not find the literature an impassable obstacle on their research journey and quickly became accustomed to the discourse of the academy. What is

particularly interesting in their accounts is that there is no reference in either the interviews or the reports of a gap between the research literature and their own practice, a gap identified by other teachers and academics in Chapter 1. Rather, the teacher-researchers found the research literature either supportive of their current practice or a guide to future practice. There is no evidence to suggest that the teacher-researchers regarded the literature as irrelevant to practice.

The teacher-researchers are now ready to leave the second waystation and launch into the unknown world of knowledge creation through research.

Note

1 'The *Quality Teaching Framework* is incorporated in all teaching and learning programs to ensure that quality education is being provided throughout the school and as a means of providing staff with a platform for critical reflection and analysis of current teaching practice, and used to guide planning of classroom and assessment practices,' downloaded from the DET (Department of Education and Training) 2008, 'Quality Teaching to support the NSW Professional Teaching Standards', www.theelements.education.nsw.gov.au/the-elements-manual/policy-reforms-and-focus-areas/quality-teaching-framework, 12 May 2017.

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5 Conducting the research

> The main data that we got was from the students because they are the ones who are depending on the teacher for instruction, some more so than others, so we thought that is the most important data.
>
> (Charles)

Introduction

The teacher-researchers have now reached the third waystation on their action research journey. In the previous chapter they recounted being inducted into the conventions of action research, receiving their Baedeker research guide and exploring selected literature on their chosen research issue. It is now time for them to embark on their own research, to enter a hitherto unknown world of knowledge creation and explore their learning and teaching issue. Through interview extracts and excerpts from the action research reports, the teacher-researchers describe salient features of their research process, using a variety of formats, as they explain how their collaborative partnerships functioned, clarify their research methodologies and in hindsight suggest what, if any, change they would make to the conduct of their research.

Supporting self-regulated learning using ICT in workshop classes: Charles and Andy

Interview extracts

CHARLES: We got together on our days off and took heaps of video footage, which we edited and then put together. I don't think I would have been as effective on my own. Having a partner keeps you motivated and on track. It was good to be able to bounce things off someone else, so if I was a little bit unsure I could throw ideas around a bit with Andy.

ANDY: We both kind of split the research tasks down the middle. When we worked on the video presentation I filmed Charles' classes as the test subjects because he had two Year 9 classes which had just got their laptops

and students bring them to class every day. My Year 10 class and my senior class don't always bring their laptops. We worked together at editing the film and trying to figure out the Schoology learning management system and then we each did sections of the report.

Excerpt from our action research report

The aim of action research is to improve practice (Pring 2004) and the aim of our project is to evaluate the use of multimedia videos as a teaching tool for specific practical projects in Industrial Design. We determined that we would judge the success of the project by answers to the following questions: Have the videos helped passive learners become active learners who seek information for themselves? Have the videos increased the amount of on-task time during lessons? Has the introduction of the videos resulted in an improvement in student self-efficacy in relation to the successful completion of practical projects?

Our research involved 35 male Year 9 students from mixed-ability elective classes, all with experience working with metals. The Year 9 programme has been designed to build students' knowledge, skills and understanding through careful planning and sequencing of meaningful practical activities. When teaching practical subjects teacher demonstrations must be precise and with sufficient detail for the observer to be able to carry out the task themselves. We have noticed that there is an increasing number of students who are unable to follow demonstrations and require individual teacher assistance and the videos were intended to provide this individualised teaching.

We briefed the students on the research project and all showed a keen interest in the use of videos for extra instruction. The task was a sheet metal tool box which involved students in marking out, cutting, folding and soldering. Each step required detailed teacher instruction and we created a sequence of short instructional videos which we stored on Google Drive linked to the Schoology website.

Cycle 1

We surveyed students prior to implementing the use of the videos to gauge the effectiveness of teacher demonstrations, time spent waiting for teacher assistance, students' feelings towards group and individual instruction and student motivation to catch up on practical work if they were falling behind. The following questions are a sample from the student questionnaire uploaded onto the Schoology website prior to the use of videos: Are you confident carrying out the next step following a teacher demonstration? Do teacher demonstrations cover too much too quickly? How much time do you spend during a lesson waiting for teacher assistance? Do you prefer individual over group instruction? When a teacher is not able to help you immediately do you lose interest in your project? Would it be helpful watching a small video demonstrating the steps you should follow to complete the project rather than wait for teacher assistance?

As well as the survey we also carried out lesson observations prior to the use of the videos. We wanted to know how much time students spent on-task. Teachers often repeat the same instructions for individual students and we felt that this was not always the best use of teachers' time and it was fostering a culture of dependency as well as contributing to student disruptive behaviour. We were also interested in the kind of questions students asked during the lesson.

Discussion of Cycle 1

One of the biggest hurdles in this cycle was the upskilling we required to create, edit and distribute the multimedia videos. We had to learn to use the digital camera, then film the workshop videos, edit them and add text after trying a number of different editing software packages. We then had to decide how to make the videos available to students. We avoided YouTube for two reasons: videos on YouTube are available to the public, and YouTube at this time was blocked on the student laptops. We therefore decided to use Google Drive to host the videos and this allowed us to store the videos in a Google cloud storage system. We shared this link with students using Schoology. We created a class group on Schoology and then posted links and files. Learning how to use three different software packages took time and there were problems, for example, when students were unable to open the videos because of incompatible Internet browsers on their laptops.

New directions

After Cycle 1 we made a number of changes to our research to reduce the workload and upskilling. We used photographic slides rather than videos and mobile phones instead of laptops as students always have these on and they provide the instant assistance that the students want. We also created a PDF portfolio for the unit of study for students to work through at their own pace and streamlined and simplified the method for sharing and accessing files.

Cycle 2

In this cycle we used PowerPoint slides with detailed explanations and photographs with the files shared through a communal USB drive. From the first cycle we concluded that the teacher upskilling required to learn new software packages and the time to film the construction of a project was not sustainable on top of our regular teaching duties. By eliminating the need to host the files on the Internet we hoped we would not encounter problems related to administering the digital learning environment Schoology. The slides focused not on a project, as did the videos in Cycle 1, but on skills. This meant that the slides could be used across projects, classes and stages in Industrial Design. Due to time constraints we were unable to carry out class surveys in this cycle; however, we collected data from observations.

What we would change

CHARLES: Other than the changes we noted in the report I don't think I would change anything.

ANDY: Probably try to go with audio in the first run but that would be another large investment of time to record audio and sync it to the video track. But apart from that I wouldn't make any changes. From what I understand about action research it is pretty much just a continuous cycle in which you always find ways to improve. And I think we came up with a pretty good idea and it did work to an extent, and there weren't any major issues; we didn't open a can of worms. So I don't think there was anything major I would change.

Using Web 2.0 technology in a special education classroom: Kathy and Barbara

Interview extracts

KATHY: We did a lot of the research work together, well pretty much all of it together, apart from Barbara going into Edmodo at the beginning.

BARBARA: I think the bulk of the work for the project we did when we were together, but then we completed different parts of the report which we emailed to each other for comment. I think I had to brush up on some skills because I had looked into Edmodo before but I hadn't done anything much with it. I had to work out how to use it in class and what the restrictions were on school computers. So there was a little bit of upskilling.

Excerpt from our action research report

McNiff (2002, p. 7) describes action research as identifying a problematic issue, imagining a possible solution, trying it out, evaluating it and changing practice in the light of the evaluation. We identified that technology, while a suitable communication medium for students with certain disabilities, can be problematic for special education teachers as our students have varying abilities and a range of physical, intellectual, emotional and social differences.

The research instruments we used in our research included a research journal, Edmodo, YouTube, quiz and poll questionnaires, observations and task assignments. Quizzes and polls were used to ease students into learning on Edmodo, exploring the site page and promoting discussion with each other. Our initial step was to join Edmodo, create two class groups and upload quizzes, questionnaires and assignments designed to promote engagement and provide observable scenarios from which to collect data and then introduce students to Edmodo through a smartboard tutorial. Through observations we were able to establish Web 2.0 etiquette and these observations were regularly recorded in a journal.

Students signed up to Edmodo and given time to chat on the site before completing a simple questionnaire. We encouraged them to establish a profile with a picture or photo. We also developed a planner tool and asked students to

enter their birthdays on Edmodo. We then presented students with a humorous questionnaire about Kathy and myself and students developed a similar questionnaire to use with each other. In another assignment students responded to questions relating to excursion choices. Their responses were graphed as a mathematical exercise and students determined which excursion would take place at the end of the year. When YouTube became available on student computers we incorporated it into lessons to support visual learning styles. Focus tasks were developed using origami lessons with direction from YouTube. We also used YouTube to foster collaborative learning through the creation of a dance routine.

To broaden students' social skills we arranged for a class from a neighbouring school to participate in a lesson about greetings to prepare students to greet unfamiliar people. The teachers at both schools modelled a 'meet-and-greet'. This was followed by a class discussion and a worksheet about what students had observed. We then had a lesson about their interests and asked them to practise conversation starters with an on-line buddy and try to sustain the conversation for as long as possible. The teachers from both schools paired the students based on the teachers' knowledge of the students and their interests. Following the initial exchange students were encouraged to have weekly contact with their buddy.

What we would change

KATHY: I would probably try and get into the virtual excursion earlier. We did have a bit of a hiccup when I was taken off class for a while so a starting-out teacher could get some experience in special education. That sort of put a bit of a stop to our project. As soon as I was back on class we resumed our research. I have been really happy with our project and it has made me want to explore different ways of teaching. I was thinking that next time I'm teaching shapes in Maths, rather than just give student booklets and solid shapes I would now go onto the smartboard and look for tools where students can be interactive, moving things around and counting sides and faces of shapes.

BARBARA: I wish it had all gone smoothly. If I could do it again I would hope that we would have different circumstances. Kathy had to change her role part way through the process and that put a bit of a stop to some things that we had planned to do. We weren't able to do our project in the sequence that we had planned, so we didn't end up getting as far as we wanted to get.

Fostering creativity using smartboards in a visual arts classroom: Valerie and Lillian

Interview extracts

VALERIE: I had to spend some time just playing around with the smartboard, really basic stuff. Even then I found that the students interacted with it in a completely differently way and also that smartboard use varied between students. As a result we had to recalibrate the smartboard for each student

because of the way they held their finger on the board. In art you have to be very precise with the calibration and I didn't anticipate this at the beginning. I think that really affected how the students reacted to the first cycle; they got very, very frustrated. With writing the report I found that I write better alone and Lillian would edit what I'd written. On the days we were together our ideas jumped forward more than doing any actual writing.

LILLIAN: I chose to do a lot of the reading and Valerie chose to structure the lessons. I was also the observer and wrote up notes on the processes.

Excerpt from our action research report

We chose a Year 10 photography elective, a small class with only nine students. We felt that the small number of students would allow all of them to be at the smartboard at the same time. The students were familiar with digital photography and visual design prior to the project, and with the smartboard, but had not used a smartboard as an art-making tool.

Cycle 1

Students took photos around the school and manipulated these on their laptops to become familiar with the image altering Photoshop. Next, students were introduced to the manipulative features of the smartboard and uploaded their photos to the smartboard with the intention of forming an artwork inspired by the David Hockney photo collages.

We found that students required greater direction than we expected and the process took longer than we anticipated. Students took photographs in groups rather than individually, so fewer areas of the school were covered and there were fewer photos. Students worked cooperatively to manipulate the photos and the teacher's role became one of managing the knowledgeable students to ensure they were teaching techniques to other students. Rather than work collaboratively, in the sense of many fingers on the smartboard, students tended to direct one student to use the smartboard. This was necessary because the smartboard did not cope with many fingers on the screen – this caused chaos.

We also found that the number of layers we intended for the collage were too numerous so we substituted a task that required manipulating only three layers. This way students could become familiar with the concept of layering and not find it too overwhelming. We also found we needed to give more detailed direction at the beginning of the exercise, and roles within the group needed to be established at the beginning.

Cycle 2

Based on our reflections on Cycle 1 we decided to make a short film rather than continue with the photo manipulation. We intended that the process would

be student-directed with students selecting a historical story which they then adapted to film. Each student took a clearly defined role involved in film making and became the class expert in that role. The planning, filming and editing were all done collaboratively. The film was edited using Windows Movie Maker on the smartboard.

Students watched the film footage on the smartboard and on record sheets, listed the best scenes and sequences and identified techniques such as zoom, close up, panning and so on, and discussed the scenes from the characters' viewpoint. The teacher demonstrated the use of Windows Movie Maker and Split film techniques on the smartboard. The students then experimented, with some teacher assistance, with the various tools available. All work was student-driven and controlled by students; students possessed the interactive learning environment.

We collected data from the second cycle using a Likert scale survey. A sample of the statements used in the survey: I feel comfortable using the smartboard; I would like to use the smartboard more in visual arts; My skills with the smartboard have improved; I want to improve my smartboard skills; I participate more in lessons when the teacher uses the smartboard; I participate more when I use the interactive whiteboard.

What we would change

VALERIE: I would scrap the project that we did in Cycle 1. I would also probably make better use of the Leader of Digital Pedagogy to help the students be more comfortable with the smartboard. It was just the difference in personalities; some students were very comfortable using the smartboard but others were a little bit shy. If the ones that were a bit shy had used it before and had someone they saw as an expert showing them what to do, I think they would feel a bit more comfortable.

LILLIAN: I would choose something simpler and that might prevent the first hiccup when we had to change our process.

Achieving academic excellence through teaching skills and content: Daphne and Lauren

Interview extracts

DAPHNE: We just kind of divided the tasks; Lauren wrote the literature review and then we sat down together and revised it. To start with we got all the literature together and we went through and picked out the articles that we thought were the most useful. I did the methodology and results section for both cycles of the research report. The discussion section we did together. Lauren is part-time so it was kind of hard for us to have days together. When I completed a section I emailed it to Lauren and she checked it and added anything that she thought needed adding. I did the

same with the literature review. I did most of the referencing for the review because Lauren hasn't had to do referencing since she was at uni and I'd been studying recently and so I knew what you had to do. With the lesson preparation we talked about what we wanted in each lesson and divided the responsibility for writing up the lessons between us. So it has really been divided equally.

LAUREN: In Cycle 1 we conducted alternate lessons and when it came to putting the report together I did the literature review and Daphne the methodology. We both worked together on the discussion because obviously we both had different ideas as to where we went wrong or what was good and what significant improvements we noticed.

Excerpt from our action research report

Our research process included the use of the Accelerated Learning Model (ALM), *NSW Quality Teaching Framework* (QTF), the 21st Century Learner and Effective Learning Strategies. We wanted to determine whether teaching content and skills is of equal importance in enhancing academic excellence. We conducted two research cycles in five key skill areas: syllabus terminology, question analysis, marking guides, extended response questions and writing under pressure (timing in examinations).

Cycle 1

The first cycle focused on the Personal Development, Health and Physical Education (PDHPE) preliminary[1] syllabus and tracked the students' results from the mid-year preliminary exam to the yearly preliminary exam. Prior to the mid-year exam, students were not taught any formal examination skills. However, prior to the yearly exam students were taught five, two-hour skill-based lessons which were structured to be engaging, interactive and to encourage higher-order thinking skills through focusing on skill development in applying knowledge through contextual learning. The results were tracked to locate student improvement. There were 17 students who worked in mixed-ability groups. The groups were intended to encourage peer learning, increase motivation and engagement and give students the opportunity to share and showcase knowledge. Data was collected through formal examinations and pre- and post-exam questionnaires. This allowed us to identify improvement in academic performance.

In the summary of the content and strategies of each of the five skills lessons below we have included in brackets the theoretical framework or model that guided our thinking.

Lesson 1: Syllabus Terminology. An important part of achieving academic excellence is the ability to recognise, understand and apply syllabus terminology to examination questions. We used memory games, group work, peer tutoring and music (QTF and ALM).

Lesson 2: Question Analysis. Being able to interpret questions and understand syllabus links and relationships in questions enables students to prepare examination answers that are of high quality. Students were given techniques to 'pull apart' questions and to practise skills in group and individual settings. The lesson focused on using Explicit Quality Criteria and Metalanguage (QTF) and mind mapping to prepare answers.

Lesson 3: Marking Guides. A practical lesson to promote total learner involvement and collaboration between learners to encourage deep understanding (ALM). The lesson focused on the use of scaffolds supporting students to create their own marking guides which they used to mark a range of sample answers (QTF). Students had to apply knowledge and skills learned in the previous two lessons to justify their marking allocations.

Lesson 4: Extended Response Questions. This lesson focused on applying content knowledge to an examination question. Students were taught the SEXY technique (which consists of statement, explain, example and why); this technique can assist students gain higher bands. Contextual learning was highlighted (ALM).

Lesson 5: Writing under Pressure. This lesson tied the other lessons together. Students wrote to a time frame answering past examination questions. Students planned (syllabus terminology), prepared (question analysis), wrote and reflected on their answers. Answers were peer-marked, from marking guidelines and feedback given on how students could achieve higher bands.

We asked students to evaluate each of the above lessons. As well as collecting data by comparing the mid- and final year exam data, students also completed a pre-exam questionnaire indicating the skills they believed they had when applying knowledge in formal examinations.

Cycle 2

This cycle focused on the HSC course with 16 students, not however in mixed-ability groups as in Cycle 1, as these groups had proved problematic in terms of student behaviour. Friday's lessons were dedicated to the skill-based lessons. Students worked through the five key areas as in Cycle 1, that is, syllabus terminology, question analysis, marking guidelines, extended responses and writing under pressure with alternating lessons focusing on practice examination questions. The lessons also focused on contextual learning and addressed the NSW QTF. Results of four HSC assessment tasks were tracked and compared with the trial HSC exam to indicate if formal lessons on skills had been effective in students developing higher-order thinking and applying knowledge to exam situations.

The Friday skill lessons focused on contextual learning and addressed the QTF areas of metalanguage, explicit quality criteria, higher-order thinking, deep knowledge and understanding. In these activity-based lessons students were given a syllabus quiz and practical questions on both the core syllabus content

and the syllabus options, the SEXY technique of question analysis, samples of Band 6 answers and finally a trial HSC.

During the project we collected data in three different ways. First, the most important data was the collection of trial HSC marks, which were compared with the preliminary yearly exam to determine whether the skill-based lessons had improved student results. To ensure reliability and validity the exam was an independent exam paper purchased on-line and teachers had no input into the exam. Second, we compared the total course marks from the preliminary course to the total course marks from the HSC course. Third, the completion of a HSC questionnaire to enable students to reflect on and evaluate the skill-based lessons.

What we would change

DAPHNE: There would be a couple of things I'd change. I'd start teaching the skill lessons from the beginning of the preliminary, although for the project we didn't because we wanted to see if these lessons were making a difference to student outcomes. However, we only left ourselves six weeks to teach the skills lessons and we were interrupted a number of times with things happening in the school. Other than that I would tweak a couple of our lessons and think more about student engagement. For example, when we taught the syllabus terminology lesson we focused on rote learning and trying to teach students what rote learning is and why it is important in the HSC. We got them to make posters and I think this time I would do something a bit more engaging.

In Cycle 2, I would use a lot of different techniques such as palm cards to write out the syllabus and students would quiz each other in class and follow this with a paper test to make sure that they had consolidated their knowledge. We've used mobile phones and iPad apps and I connected my iPad to the smartboard so it became interactive and students could do the activity on the smartboard. I'd make sure we really access the technology side even more because that has made a big difference.

LAUREN: I would definitely change the Friday lessons because these were affected by assemblies and that mucked us around a bit with timing because we never knew if we were going to get a long lesson or a short one or somewhere in between. So it was a little bit disruptive and hard to keep the students on track.

Improving times table automaticity using ICT drill and practice: Sophie and Nancy

Interview extracts

SOPHIE: Nancy and I divided the workload. We worked well together. I was more focused on the literature side of things and trying to find information to go with what we were doing. Nancy was more focused on presenting the results and coming up with ways of testing the students.

NANCY: We worked well together with Sophie being the typist more than anything. I proofread and helped reword the project report. Other than that we didn't really have separate roles much at all, we just shared.

Excerpt from our action research report

Teachers frequently use practice and drill to consolidate new learning. There are arguments that drilling is ineffective and that students need to understand what they are doing and why. However, practice and drill can improve the recall of new concepts. We chose two Year 8 classes for our research, a high-achieving class and a lower-achieving literacy class. We hoped to prove that drill and practice are of benefit to students. We used observation and pre- and post-student surveys and testing. The pre-test focused on students' level of knowledge and use of computers and the students' self-appraisal of their times table ability. A sample of the questions we asked students: Did you use computers for maths in primary school? Are you confident using a computer? Do you use computers to play games at home? Do you use computers to play educational games? Would you like mathematics more if you able to play computer games? Are you confident with your times table?

We also used a computer website which allowed for review, drill, practice and testing, based on time and results, to be completed on a report card. The website was easily navigated and easily used by students and had all the requirements for us to complete our research. However, when we came to Cycle 2 the website was no longer available and while there are many such websites, none provided the same drill and practice and recording features as the original.

Computer-generated tasks allowed data to be easily collected as students completed and printed their work and we collected the results. We converted the data into a column graph comparing students' test results. We did a post-test questionnaire in which we asked the following questions: Did the computer help you learn the times tables? Did you like using computers for maths? Did you find the drill practice helpful in remembering times tables? Did being timed motivate you to improve your score? Did you like working at your own pace and testing yourself?

Following the pre-test of the second phase we introduced students to a new website where they competed against the computer to win a car race. The student's car would only move when they chose a correct response to a multiplication question. These questions were a random selection of numbers between 1 and 12. The students were able to play this game repeatedly over a number of lessons trying to constantly beat their personal best score.

What we would change

SOPHIE: I would probably do the research on my own because I would be more pressured to get it done rather than feeling I could lean on someone else. Working with someone else wasn't good for me because I was always waiting for us to be able to get together.

NANCY: I think probably the only thing would be to be more consistent. I had unavoidable time off and this just created too much disruption to the whole project. The project needed more consistency and then we would have been able to change things a little bit quicker.

Asking good questions in the classroom: Will and Luke

Interview extracts

WILL: I observed Luke's class and recorded every question he asked and determined whether it was part of a questioning sequence. I also gave every question a cognitive level based on our understanding of questioning taxonomies from the literature.

LUKE: Will observed my class and noted every question I asked the students and then we categorised them using the *Quality Teaching Framework*. I also went to his lesson and did the same. I used the pre-testing data to develop an exemplar lesson and from the questions in this lesson we developed the question rubric. Will's facilitation of the readings went really well and we basically just worked in our strength areas.

Excerpt from our action research report

Data was collected from two senior classes in two different humanities subject areas because we felt these classes were the most appropriate to fully explore higher-order thinking strategies. We also collected data from a small sample of Year 7 and 10 students in relation to their classroom experiences and perceptions of the use of questions in the classroom. We observed two of each other's lessons to collect data on the number of questions asked in a 'typical' one-hour senior lesson and identified the cognitive level of each of the questions.

Cycle 1

Using Luke's lesson we drew mainly on the work of Gallagher and Ascher (cited in Vogler 2005, 2008), who identified four different kinds of questions: cognitive memory questions, convergent thinking, divergent thinking and evaluative thinking. We used these levels to develop a lesson so that the teacher asked only predetermined questions which aimed to create a learning pathway to take students on an increasingly complex thinking path. We identified 99 questions, which were documented and categorised in terms of both their cognitive level and evidence of their relationship in terms of different sequencing patterns.

Cycle 2

In this cycle we developed the Higher-Order Thinking (HOT) question rubric. After analysis of Luke's lesson a fully developed rubric was formulated to provide

examples of appropriate starting phrases to prompt the type of question being targeted in each section of the rubric. This rubric was then used as the basis to present a lesson that focused on targeting students on a learning pathway that journeyed through the specific topic in a broad to narrow sequence of questions.

We conducted a survey at the beginning of the lesson asking students questions about their perspectives of the impact of teachers developing greater skills in asking quality questions. At the end of the lesson there was a discussion of students' views on the quality of questions they had been asked along with questions about their levels of engagement.

The survey included such questions as: If good questions lead you to think about new things, do you think that teachers should ask good questions in the classroom? Is the way teachers ask questions important to the way you ask questions in the classroom? Should teachers spend time learning how to ask good questions? Is students asking questions an important part of how you learn? Do you think a better sequencing of questions would be more engaging and provide a deeper level of learning?

What we would change

WILL: There was enough time and enough support and we were fairly confident and competent and ended up pretty happy with what we were doing.

LUKE: I'm happy with the project. We didn't change anything in the second cycle because the first cycle worked so well; we knew we were on track.

Summing up

Taken together, the teacher-researcher narratives reveal an extensive level of collaboration in their research processes. The most apparent form of collaboration was between the teacher-researcher partners who negotiated roles and responsibilities based on their current expertise and willingness to acquire proficiency in hitherto unexplored areas of practice. With one exception, working with a research partner was seen by the teacher-researchers as advantageous and enriching to the research process. Another kind of collaboration was with students and is evident in all of the projects. Students were for the teacher-researchers not only research subjects but also research partners who were 'briefed' on the projects and given a voice in the research process through the data collection methods. The multiple collaborations evident in the projects highlights the critical democratic aspect of action research which closes the gap between 'the researcher and the researched upon' (McIntosh 2010, p. 33).

The narratives also reveal an array of data collection strategies that the teacher-researchers incorporated into their regular classes, the same classes in which they located their research. These strategies resonate with Bartlett and Burton's (2006, p. 397) observation that action research methods of data collection 'are tailored to suit the circumstances. Each research project is designed for a specific set of circumstances and so is unique.' The data collection methods chosen by the

teacher-researchers at Grange were selected based on the teacher-researchers' understandings of research, the suitability of the methods to their practice and to their contractual teaching obligations, which ran parallel to their research activities, and to their notions of what would constitute good research evidence. Winter (1998, p. 59) observed that action research 'is characterised not by separate and different methods of inquiry; but by a more sustained attention to the methods of practice' and this was evident in each of the Grange projects.

The narratives in this chapter indicate the nuanced understanding the teacher-researchers had of their classroom practice and of the needs of their students. What is evident is the kind of 'connoisseurship' to which Eisner (1991, p. 68) refers. Where timetable constraints permitted, the teacher-researchers selected classes for research because they considered that the students in these classes would benefit most from the research activities. In this way the research protocols were tailored to meet both the research needs of the teacher-researchers and the learning needs of their students – all of which highlights the advantage of the 'indigenous' researcher with insider knowledge when launching and sustaining a classroom-based research project. It must be remembered that in researching within their own classrooms teachers juggled their contractual obligations in terms of syllabus and assessment procedures while at the same time systematically researching their chosen research issue. Teachers were given release from face-to-face teaching but this did not interfere with their contractual obligations because the average release time taken by each of the research teams was only five days over the course of the year of their research.

The research methods used in the projects generally align with qualitative methodologies, although there were projects in which comparative numerical data was collected, for example, the projects of Daphne and Lauren and Sophie and Barbara. Technology was both an issue for research as well as a research tool in a number of projects and this form of data collection was combined with interviews, observations and examination results. Andy and Charles included a range of technologies and collected data from surveys and observations. Barbara and Kathy collected data from students' engagement with Edmodo and combined this with questionnaires, class discussions, observations and worksheets. Valerie and Lillian gathered data from observations and surveys of the students' responses to new technologies. Daphne and Lauren accumulated data from examination results, pre- and post-exam questionnaires, assessment tasks, surveys and observations. Sophie and Nancy employed observations, pre- and post-student surveys, and tests and data from students' computer activities. Will and Luke used observations of each other's teaching, interviews with students and student surveys.

It is important here to draw attention to the ethical protocols of conducting the action research at Grange High. Each of the research teams worked within the ethical guidelines of a NSW government school and consulted with the principal throughout the project. Where research activities required students to venture beyond the school, as in the research of Amanda and Helen narrated in Chapter 7, permission was obtained from all parents and guardians and from the school principal. Their projects were not separate from their daily practice

as teachers but were instead integrated into the teacher-researchers' timetabled classes where they engaged the students as active learners and active research participants. In disseminating their narratives, a further ethical consideration to which I have adhered was ensuring the anonymity of the teacher-researchers, the students and the school as I did in my earlier Grange High publication (Scanlon 2015).

Time, as a workplace constraint to the inclusion of research in teachers' work, was explored in Chapter 2 and this constraint was mentioned by the Grange teacher-researchers. They referred to juggling teaching and research and also to time lost to both teaching and research through disruptions caused by school assemblies, changes to teaching schedules, teacher-researcher and student absences. Time was also significant for teams where the acquisition of new skills was a necessary prerequisite to their research, for example, the research of Andy and Charles and to a lesser extent Lillian and Valerie and Kathy and Barbara. These research teams focused on technology and this required the extensive acquisition of new skills as the teacher-researchers learned to interact with video and filming technologies, Edmodo, Schoology, smartboards and digital photography and also had to incorporate these into their pedagogical practices and adjust their pedagogies to the new technologies. Andy and Charles felt that the time required to acquire new skills meant that their project was not sustainable in the long term. However, it must be remembered that the very engagement in action research required all of the teacher-researchers to acquire a wide range of new skills.

The teacher-researchers gave no indication that, in hindsight, they would make major changes to their research process. However, some minor adjustments were noted: using PowerPoint rather than creating videos in Andy and Charles' project; opting for a film sequence rather than a photo collage in Valerie and Lillian's project; and changing the timing of lessons to avoid as far as possible disruptions beyond the control of the teacher-researchers. Overall the teacher-researchers saw the research as an opportunity to experiment with alternate pedagogies which went beyond their specific research project and they also envisaged that their research experiences would filter into their future daily practice.

The research is now complete and the teacher-researchers are poised to enter the fourth and final waystation on their research journey where they share their research findings with their colleagues and with the reader in the following chapter.

Note

1 The preliminary refers to the syllabus content taught in the first year of the senior school.

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6 Sharing the research findings

> I think that in order to achieve some outstanding results you absolutely have to make the time.
>
> (Lauren)

Introduction

The teacher-researchers have completed their research and reached the final waystation on their journey. Following the pattern of previous chapters each narrative begins with interview extracts which record the individual reflections of each of the teacher-researchers, after which their collective rendering of their findings is found in excerpts from their action research reports. These reports do not follow a standardised format; some report the findings in two distinct research cycles while others use various forms of reportage appropriate to the individual project. After sharing their research findings, each of the teacher-researchers individually comment on how they feel about the dissemination of their findings in a presentation to their colleagues and in a written report.

Supporting self-regulated learning using ICT in workshop classes: Charles and Andy

Interview extracts

CHARLES: The students liked the fact that we had put a project together especially for them and they felt privileged that they were part of the research. I think the students benefited from our research and it was something that I've enjoyed. The whole project has been a worthwhile experience, a little bit of extra work for us but we were given time. I'm appreciative of that because we wouldn't have been able to do it unless we had those extra days here and there.

ANDY: The videos we created were useful certainly and we think with audio they would be a very worthwhile resource. However, there were issues with time and students gaining access to the videos because of incompatible

technology. Throughout the project there was an increase in student self-confidence and once students start to build and gain confidence they are on their way to meeting the syllabus outcomes.

Excerpt from our action research report

Before beginning our research we surveyed students, asking questions about the effectiveness of teacher demonstrations, time spent waiting for assistance from the teacher, preference for group or individual instruction and motivation to catch up if students fell behind in a project. When we analysed the survey we found the following: 84% of students preferred demonstrations in small groups; 60% preferred to ask questions individually after a demonstration; 52% said that sometimes demonstrations covered too much, too quickly; 32% lost interest if the teacher could not immediately respond to them; and 44% lost interest once they had fallen behind in a project. The question for us following our analysis of this data was: How do we work with these attitudes and provide relevant instruction during practical lessons?

Cycle 1

At the end of Cycle 1 we conducted an in-class survey of student responses to the videos we created with the following results: We found that 78% of the students thought the videos were beneficial; 78% preferred to view videos on mobiles or tablets rather than logging in multiple times to laptops; 83% thought watching the videos would be helpful prior to beginning projects; 83% only used the videos once or twice during a lesson; and 61% thought that it took too long to login to videos. (Students had first to login to their computer, then the Department of Education and Training website, then Schoology and then wait for the videos to load.)

As a result of these findings we concluded that students were not using the videos a sufficient number of times to warrant the amount of time we spent creating them. As a result, in Cycle 2 we decided to create a slide show with MS PowerPoint as a more realistic resource as this did not incur an unrealistic workload. Another advantage of PowerPoint was it was on each student's computer; they were able to view the slideshow without encountering web browser incompatibility.

Cycle 2

Due to time constraints we were unable to carry out in-class surveys but we collected data from observations and found that students were still reluctant to take time to power-up and logon to their laptops. We introduced slides at the end of theory sessions if time allowed and this helped students understand what was required in the follow-up practical workshops. Students felt the slides did not provide as much detail as the videos even though the slideshow had detailed explanations and photographs. However, sharing files via communal USB saved

time as we did not have to use Google Drive and Schoology and this lessened the likelihood of technical difficulties. Students who needed extra support did not use the skill-based slides because they needed step-by-step instructions for specific projects. Overall we found that students preferred individual instruction from the teacher when they encountered difficulties with a project.

Sharing our research findings

CHARLES: No worries at all with making a presentation or in sharing our written report.

ANDY: I guess that won't bother me. I think it will be seen positively by most teachers. There's always going to be a few sceptics and a few people that will probably think money might have been spent better elsewhere. I'm happy to share our written report. I have found the project beneficial and if other people find it interesting and it gets them looking at different ways of doing things or maybe adopting something similar then that's great. I also think it's another feather in my cap for whatever the future holds in terms of employment or where I want to end up. I don't think it's anything extraordinary or super special but it doesn't bother me to share it around.

Using Web 2.0 technology in a special education classroom: Kathy and Barbara

Interview extracts

KATHY: I would say the students are now communicating a lot better through social networking so the project has really helped them. The students who were most confident with technology showed leadership skills and team-building skills; there was new enthusiasm from the kids; it has really helped with their friendships; and they are more engaged in learning.

BARBARA: We found that many of the students really benefited from the project. They came out of their shells, developed their social skills and gained a sense of belonging and of family.

Excerpt from our action research report

We found that Web 2.0 technology has a role to play in learning outcomes for students in special education. Our data collected over five lessons (three lessons on Edmodo and two on YouTube) showed that students enjoyed socialising on Edmodo and were happy to post work samples and to converse with their peers. The more they used Edmodo, the more confident they became. Their technology skills were enhanced, with several students taking a leadership role to support their peers. We used YouTube as a visual learning tool and students showed high levels of engagement and positive communication.

Introducing Edmodo

We introduced students to Edmodo through a smartboard tutorial and found that all students were curious, engaged and motivated. They were visibly excited and curious about the prospect of being able to use a social networking site in class. Only one student did not have prior knowledge of social networking; some students already used Facebook and others wanted to be users of Facebook. Students were highly motivated and required no encouragement to approach their computers.

The signing-up process to Edmodo was difficult for the teachers as the process required students to have a certain level of technological and literacy skills. A few students completed this quickly but most needed considerable assistance. In the Moderate Intellectual Disability class (IO) three students needed a support person to complete the entire sign-in process for them. It was not possible for the class teacher to provide this level of assistance. All three students did learn to logon; however, it took eight weeks to achieve this. Six of the technologically competent students stepped in and helped students who were having difficulties without being asked to do so by the teacher. The previously socially shunned student in the class became a teacher and motivator for her peers. Her willingness to provide assistance became her first major positive social experience in the class and helped to establish her place in the group.

Creating a personal profile and completing a short multiple choice questionnaire was easy for most students and most happily explored and created profiles independently. Students with lower literacy skills required some assistance. Only two of the 25 students said they were bored. The others took pleasure in doing what other teenagers do.

Egocentric activities

For the second lesson we wanted students to express aspects of their personal identity. We developed a planner tool and asked them to enter their birthdays on Edmodo. Some students had to be reminded of their birth dates and where they appeared on the calendar. Most students worked happily on this task but one student became overly enthusiastic and attempted to enter all of his family's birthdays. When he made a mistake with his sister's birthday he became upset and while waiting for the teacher to correct the error lost enthusiasm for the activity. This was the most literacy-reliant activity and sparked some negativity in five of the 25 students who wanted to opt out of the task and it was difficult to re-engage them. Most students engaged in extensive written dialogue and this occurred within and between IO (Moderate Intellectual Disability) and IM (Mild Intellectual Disability) students.

Fostering unity

To foster social ties we developed an assignment for both classes asking where they would like to go on an excursion. Students were given three options and asked to respond to questions about these options. This was participation for

a common goal. Students were motivated by the real-life relevance of the task and excited to be able to contribute to the decision making process. The assignment prompted exchanges on Edmodo and some students started to genuinely chat. Their conversations branched into wider topics as they began to initiate conversations about their interests and to post photos.

Audio-visual learning

Using YouTube has enabled us to take on new roles as facilitators and tutors and this has allowed students to take more responsibility for their own learning. In craft lessons they created a wall scene decorated with origami characters, a duck, fish and flowers which they had made by following instructions on YouTube. Students responded positively to these lessons. One student was so engaged that she learned to make other origami using YouTube at home, showed these to her peers and gave a lesson to the class.

Collaboration using YouTube

YouTube was used in a practical lesson to help students collaboratively create a dance routine. Students watched a number of YouTube clips and the teacher and students practised a number of simple sequences and were able to collaboratively choreograph the sequence; the result was performed at a school assembly. Students had to respect each other's ideas and to communicate with their peers and this social learning experience enhanced the group ethos.

Conclusion

We found that Edmodo and YouTube have social interaction, engagement, instructional and personalised learning benefits. It has been rewarding to see less socially capable students become more confident in their communication. Redecker et al. (2009, p. 40) suggest that Web 2.0 tools support the learner's sense of ownership of the content, which in turn encourages motivation. These tools need to be integrated into existing learning settings and environments in a meaningful way. We found that by using Edmodo and YouTube we were able to tailor our learning outcomes to suit the technology and make the content meaningful at a relevant level for students. Students were motivated and active in the learning process and Edmodo supported students' ownership of the content. We found networking supports the exchange of knowledge, collaboration and sense of community and this was further expanded with an 'Edmodo buddy' from another school.

We feel that the social benefits are the most significant aspect of Web 2.0 technology. Seeing students with speech impediments and social insecurities chatting and involved in social forums without the concerns of face-to-face anxieties was exciting for us as teachers. Although not all students were comfortable with social networking because they had literacy difficulties. We have continued to use Edmodo and YouTube in our lessons following the end of the project.

Sharing our research findings

KATHY: I always feel a little bit nervous talking to colleagues; talking in front of students is different. But it is all so relevant to all the kids, not just the Special Ed ones, so I'm happy with others seeing our report.

BARBARA: I hate presentations so I find it hard to say it's going to be fine because I will be a nervous wreck. I feel OK about the written report but not fabulous.

Fostering creativity using smartboards in a visual arts classroom: Valerie and Lillian

Interview extracts

VALERIE: We found that the smartboard can be used for creative collaborative artworks but that the artwork needs to be carefully chosen and it's important to have students work in small groups and have clearly defined roles. We weren't happy with the first cycle because we didn't know the limitations of the smartboard, but we did learn a lot. We discovered that the main limitation was the number of students who can touch the smartboard at one time before it freaks out. So we tailored the project for the second cycle to counteract this. I believe students learnt quite a lot from the project.

LILLIAN: Very positive results. We decided that the smartboard can be used very creatively; however, only one student at a time can actually manipulate it because it is very sensitive to touch. We found motivation was really high; students loved the fact that they could actually get in there and be in control of the images. We think we have something to add to the overall action research initiative.

Excerpt from our action research report

Our research showed the benefits of using the smartboard to enhance creativity in the art classroom and our findings align with the contemporary research we read in our literature review. The cost of the smartboard is validated by the number of uses it promotes and the level of engagement, connectedness and student-directed learning it facilitates. As teachers become more familiar with the technology it can be incorporated into creative teaching and learning. This is so, particularly with the new art curriculum with the development of Media Arts as a separate subject. Student engagement meant that there were virtually no behavioural problems and student enthusiasm promoted a flow of creativity. The physicality of the smartboard with its proximity, sensory engagement through touch and its immediate reaction promotes student ownership of the collaborative project. This was a powerful demonstration of engagement through technology. Students worked collaboratively and this promoted deep knowledge.

Students felt comfortable using the smartboard and felt they would like to use it more in visual arts classes. Many students were keen to improve their skills and some felt that their skills had improved by the end of the project. Most students found the smartboard enjoyable but did not prefer it to their laptops. Although most agreed that they participated more when they used the smartboard. Students also participated more when the teacher used the smartboard rather than the traditional whiteboard. None of the students found the smartboard difficult to use but some students did find it difficult to be in front of the class and were uncomfortable when their individual work was shown. A number of students used the smartboard as almost an extension of themselves: 'I like to use the smartboard over the computer because I feel like I am inside the artwork I am working on', one student said.

The research allowed us to assess the use of the smartboard in our classes and to better understand the benefits and limitations of the technology. We have learnt how to use the smartboard as a creative art tool and identify its advantages over traditional technological tools. Our pedagogical practices have changed and adapted to the new technology throughout the project.

More research with a focus on the interactive whiteboard as an art tool could explore how technology-based collaborative art works could link classrooms from different schools to collaborate in real time over distance. The interactive whiteboard could also be incorporated into performance artworks as a medium allowing artist, artwork and audience to interact.

Sharing our research findings

VALERIE: I'll feel nervous but that is in general terms of speaking in front of colleagues. Our written report? I feel perfectly fine with that, love it.

LILLIAN: I am a bit nervous because I am always nervous getting up in front of everyone, but that will be OK. I'm comfortable with showing our written report.

Achieving academic excellence through teaching skills and content: Daphne and Lauren

Interview extracts

DAPHNE: The results from the preliminary course were very positive with 11 out of 17 students improving from mid-year to the final exam in Cycle 1. The Cycle 2 results weren't as positive. For example, while our top students improved, the bottom students haven't; in fact they've gone backwards, some quite significantly. We believe there were a number of reasons for this: it was the first three-hour paper students have ever attempted; Friday lessons were frequently interrupted; and the students who regressed were also observed to switch off during the lessons. The brighter students have improved, but somehow we have missed the bottom end. And I guess really

that is kind of where we were hoping we would pull marks up because if you have a big tail in the HSC, the way the scaling works this can sometimes pull down the marks of the top students.

LAUREN: There were students amongst the eight higher achievers who really amazed us in the trial HSC. They worked so hard and they actually got it; they just got the process of what they had to do and how they had to do it. I think that that was a clear indicator that our process worked and that student improvement was very much linked to our action research because students only learned new skills because we honed in on them in our project.

Excerpt from our action research report

Cycle 1

Our pre-lesson questionnaire asked the 17 students to analyse their understanding of syllabus terminology, ability to analyse exam questions, the importance of marking guides, ability to structure extended responses and their knowledge of time management. We found that 15 students believed they had average to very poor knowledge of syllabus terminology, 14 students had average to very poor skills in analysing questions, 10 students understood the benefit of marking guidelines, 14 students believed they had average to very poor skills in structuring extended response questions, and 15 students thought they had poor time management skills. Students were also asked to set a goal for the HSC and 13 of the 17 students indicated that they could gain a Band 3 but were not confident they could perform in the pressure situation of the examination.

Our aim was a 75% improvement in student achievement as reflected in examination results. Data collected from the final year preliminary from 17 students revealed the following results: 11 students or 60% improved their results after the skills lessons; the highest individual improvement was 45% and the average 12%; six students or 36% did not improve their results and some of these students had a significant decrease in their marks. The reasons for the decline in these six students we attributed to: students not answering the required number of questions; all six students were absent from at least three of the skills lessons; three of the students were observed not to be engaged during the lessons they did attend, and did not participate in their groups.

Students completed a questionnaire following each of the skills lessons. A summary of their responses and sample comments appear below.

Lesson 1: Syllabus Terminology. All of the students said they understood the relevance of the lesson and it had improved their knowledge: 'I believe my knowledge has increased and it made me use a different learning technique and work with different people. It gave me a positive vibe.' Three students said that the lesson strategy was poor to average but helpful and made comments such as: 'The process was lame and not entertaining but it was beneficial in teaching me the areas of the syllabus and where to improve my knowledge.'

Lesson 2: Question Analysis. All students said their knowledge had improved: 'We need a lesson like this once or twice a topic as it not only helps us understand the type of questions we will be asked but also helps us revise.'

Lesson 3: Marking Guides. There was low attendance at this lesson but all students who attended said the lesson strategy was effective: 'I thought this was the best-run lesson so far. It made me understand what the marker was looking for and how we would be marked. Marking others and having to tell them why we gave them marks was really hard, but it was good.'

Lesson 4: Extended Response Questions. This lesson was well attended and all students believed that their knowledge improved and that our technique was effective: 'This was the hardest lesson but I liked it because everything I learned in the other lessons had to be used in this one. We need to practise extended response questions because I've never had to write stuff like this before. It helped my confidence.'

Lesson 5: Writing under Pressure. There was low attendance at this lesson but those who attended thought they had improved their knowledge: 'I hope it will stop me wasting time on multiple choice questions.'

Overall students rated Lessons 2, 3 and 5 the most useful.

Cycle 2

The skills lessons took place over 10 weeks in Cycle 2 as each alternate lesson focused on examination practice questions. In the skill-based activity lessons in Cycle 2 we used palm cards, mobile phone apps, posters, interactive iPad activities on the smartboard, peer tutoring, Smart Note and PowerPoint activities, quizzes and traditional paper and smartboard quizzes. We found the inclusion of digital media was most effective. Following the trial HSC we again collected feedback on each of the skill lessons with the following results.

Lesson 1: Syllabus Terminology. All students said they had improved. In Cycle 1 three students found the lessons boring, however, in Cycle 2 only one student did not like the method of teaching: 'Having the syllabus quizzes every lesson and always being reminded about the syllabus I know what I have to do to get good marks. The use of apps on our mobile phone to help us with our syllabus quizzes was a good idea as I'm always on my phone.'

Lesson 2: Question Analysis. 76% of students said their skills had improved: 'I always forget to plan my answer so this technique reminds me to plan and make sure I don't forget the syllabus and it did help me revise how to tackle questions and not to freak out.'

Lesson 3: Marking Guides. 60% felt they could use a marking guide correctly and 50% felt guides could have been used more in preparation for the trial exam: 'I like having the marking guide and sample questions; it helps me understand how to structure my answers.' Another student: 'I find using guides quite difficult and don't know if it helps me write a better answer.'

Lesson 4: Extended Response Questions. 50% felt that not enough time was spent on completing extended responses: 'We didn't have enough time to practise big mark questions.'

Lesson 5: Writing under Pressure. 29% wanted more practice in class: 'Time management is my major concern. Sometimes I write too much for a question worth only three or four marks.'

A very valuable comment made by all students was that having the lesson on Friday was unproductive because the school assembly affected the length of the lesson. Some weeks the lessons were reduced from 55 minutes to 20 minutes.

Discussion of Cycle 1 and Cycle 2 findings

Following a reading of the literature we hypothesised that teaching content and skills would improve academic success with our senior class as well as improve students' higher-order thinking, produce a quality learning environment and increase student self-efficacy. In the final examination two students gained a Band 5, four a Band 4 and nine below a Band 3.

We found in our research that collaborative learning did not work for all students and in Cycle 2 students were given the choice of working collaboratively or individually. The results showed that the students who worked collaboratively had a higher rate of improvement than those who worked individually. We provided additional support for students, giving them the opportunity to submit Friday class work, which we returned with comments on Monday. Those students who did so also showed a higher level of improvement.

It is evident from our research, even though we did not reach our target of 75% improvement, that teaching skills and content is of equal importance. We also found that higher-order thinking and a supportive learning environment are essential in improving academic excellence.

Sharing our research findings

DAPHNE: The presentation doesn't really bother me too much. I'm happy to talk about our research but then I have a bit of a thick skin. Some people are reluctant definitely; I think some of the other groups don't want to present. I guess we are kind of seen by some of our colleagues as 'the action research team'. I think what people are worried about is that there are a couple of members of staff who are very vocal in their opinions and sometimes they can be negative. And you know this is a project people have spent hours on and they are quite proud of what they have done, and to be cut down in front of the whole staff, I think that is their biggest fear. I do think that presenting to the staff is important. Sharing our written report is also important because it shows people that we haven't been bludging and that we haven't been wasting money.

LAUREN: I feel OK about presenting. Of course there will be staff that aren't particularly interested or don't like too much change. Of course there will be that, but that's OK. There will be other staff who are quite motivated and impressed and think that they can utilise what we have done. Making our written report public makes me feel a little bit important. Hopefully, hopefully other teachers will get a little bit out of it.

Improving times table automaticity using ICT drill and practice: Sophie and Nancy

Interview extracts

SOPHIE: I was disappointed with the results. They weren't as good as we hoped. I guess we had a few difficulties with computer rooms and finding the time for the research while teaching the syllabus. We were happy with Cycle 1 and I was happy with my kids because they just absolutely loved it. They really enjoyed doing something different.

NANCY: I think our results were good and showed that we need to have a focus on automaticity. Unfortunately we were off task a little bit.

Excerpt from our action research report

In our research we found that nearly every student in the literacy mathematics class improved their test results and times; some students improved dramatically, other students showed minor improvements. This class was the lowest-ranking group academically and required the most assistance with their recall of times tables. An improvement in test times shows that a greater level of automaticity was achieved through the use of computer-generated drill and practice. Table 6.1 is a sample of post-project student responses to questions regarding the use of computers for times tables.

Table 6.1 Post-project responses to questions on the use of computers for automaticity

Question	*8L Yes responses*	*8C Yes responses*
Did computers help you learn your times tables?	75%	65%
Did you like using computers for maths?	81%	70%
Did drill and practice help you remember times tables?	88%	60%
Did being timed motivate you to improve your maths scores?	94%	45%

Table 6.2 Results of timed automaticity test

Class	*Pre-test mean*	*Post-test mean*	*Change*
8L (literacy class) n=20	33%	52%	19%
8C (academic class) n=22	92%	95%	3%

The highest-ranking academic class did not seem to overly benefit from our project because they were already confident with their times tables. Their results were 100% almost every time. However, they did improve on how quickly they could recall times tables. These results indicate that the process was not as useful for the top class because our strategies were based on remedial exercises. We concluded that the more academic students would benefit from tasks that require higher-order thinking as they have already achieved the basic knowledge required to succeed. In our literature review we noted that Westwood (2003) warned that higher-ability students may benefit less from drill and our findings concur with this.

For the second cycle of our research, as we could not find a website that would provide us with all the information that was required, we conducted a timed test with students required to answer 60 questions in one minute on paper to assess the students' ability levels through correct responses. These results are shown in Table 6.2.

It is apparent from these results that the greatest amount of change, 19% improvement, came from the literacy class. Again, the academic class saw very little improvement, once again showing that the activities in our project were unsuitable for these students.

Attitudes

In the first cycle of the project most students enjoyed the new student-centred learning style. The time it took each student to review and drill before testing themselves varied from student to student. This allowed for more competent students to move faster while students who encountered difficulties could take their time. In the lower-level class, 94% of students preferred learning mathematics this way. The advanced class was less impressed, with only 45% preferring this style of learning. This can be attributed to the fact that they already had the skills required to succeed.

Students in the literacy stream embraced the independence that this task allowed because it created a much more enjoyable learning environment for them. However, it was clear that due to the nature of drill and practice they required some background knowledge before attempting the task. The task had very little teacher involvement and relied heavily on the students being intrinsically motivated, which also came from them being able to immediately see the improvement of a skill in which they previously lacked confidence.

The second cycle created some student discomfort because of the competitive style of the new website. A few students found it difficult to beat the computer and their focus was no longer on improving their personal best scores, but rather on being defeated by the computer and feeling a sense of failure rather than achievement. This often led to these students abandoning the task.

Difficulties encountered

Although there are many websites that offer games related to multiplication, none provided the drill and practice and recording features of the previous website, which was not available in the second cycle of our research. Finding a new website caused problems as we tried to replicate the elements that had previously been covered in the first cycle. Although the second website allowed students to create a group so that they could race each other, the school computer system did not have the program capabilities to cope with multi-player functionalities.

This style of lesson required booking a computer room for an entire lesson, as the lesson could not be completed in the normal timetabled classroom. This meant that a task that would normally take 15 minutes to complete took longer because of logging on to computers and moving from one classroom to another. Time is a valuable commodity in modern classrooms, and finding time for these lessons in an already jam-packed syllabus was a challenge and sometimes disruptive to the normal flow of the lessons. In order for this task to be more effective it would need to be considered during the writing of the faculty program prior to the commencement of the school year.

An added issue with the computer room was that as both teachers were researching different classes, but within the same year group, computer bookings were difficult to come by as the classes were often timetabled at the same time. This allowed for fewer lessons to take place. It would require long-term planning if all mathematics teachers were to attempt these lessons in the future.

Conclusion

Technology is an extremely vital tool in today's educational setting. It provides for excellent drill and practice of mathematical activities in an engaging, fun and creative way, indicating that drill and practice does not prevent meaningful learning. Much of the drill and practice software available to educators is based on mastery learning techniques which require students to master each level before progressing to the next.

The introduction of sound and graphics may have allowed students to be further engaged and motivated in the numeracy program. Students enjoyed using drill and practice software games and the interactive educational environment. Though students were doing repetitive mathematical problems, because of the drill and practice software they remained on task longer than if they were doing paper drill and practising mathematical questions. Hence students were reaching a higher level of automaticity of multiplication concepts.

Structured curricula in the form of a drill and practice strategy through mathematical software programs saw a reasonable improvement in the student's multiplication skills. Our results support Heward's (2003, p. 188) questioning of the faulty notions that 'structured curricula impede true learning' and 'drill and practice limits students' deep understanding and dulls their creativity'.

New directions

During this investigation the following points became very clear: sound and graphics have allowed us to engage and motivate students in the numeracy programme; some students enjoyed using drill and practice software games; some students' motivation was enhanced through an interactive educational environment; even though students were doing repetitive mathematical problems because of the software, students remained on task longer than if they were doing paper drill and practice questions; and finally, students were reaching a level of automaticity of multiplication concepts.

Sharing our research findings

SOPHIE: I'm very nervous about doing a presentation. I feel as though maybe our project is not going to be up to scratch. I mean we have been given the same amount of time off and support so if ours is not as good as others I think that would be a bit disappointing. There is always going to be someone who has done incredible things that has made a huge difference. I guess I am a bit disappointed that we didn't really make a difference as such. However, I think that we should distribute our report because we have worked hard. But it's all nerve-racking, there is no denying that, but there's no reason not to be proud of it.

NANCY: I think after this interview I'm feeling a little bit more confident than I would have before, where I would have thought, 'Oh this has just been so hard and we haven't really come out of it with anything.' But now that I have talked to you and the questions you have asked, I think, 'Oh well maybe we have achieved something.' I think that we should share our report. I guess comparison with what other people have done is nerve-racking.

Asking good questions in the classroom: Will and Luke

Interview extracts

WILL: The main result was the construction of a HOT (Higher-Order Thinking) rubric that gave an indication of a generic way teachers could start questions in a sequence to promote higher-order thinking. We also worked on a second rubric which gave examples for each faculty showing how the generic rubric could be applied to different subjects.

LUKE: We knew the rubric worked well because of student responses when we trialled it.

Excerpt from our action research report

We found that simply asking questions as a reaction to students' immediate needs does not lead students to sustained levels of higher-order thinking. Moreover, simply understanding the cognitive level of questions and the pattern sequence will not of itself make teachers highly skilled in using verbal questioning – hence our development of a practical aid to enable teachers to structure questions.

During Cycle 1 we found from lesson observations of two classes that in one class 48% of questions were framed by the teacher at the lower cognitive level and in the second 60% were at the lower cognitive level. During Cycle 2, in both classes, 68% of teacher questions were cognitive memory questions; however, there was an increase in higher-order questions. With practice in using the HOT rubric we hope that teachers will be better able to develop question sequences to support higher-order thinking.

The new knowledge created from our research was the questioning HOT rubric, which has been developed to provide examples that might be helpful for teachers in secondary schools and is intended to support each faculty in developing their own highly comprehensive rubric that best suits their own unique needs. The generic rubric is shown in Table 6.3. The arrows in the table indicate the source of the questioning taxonomy.

We do not present this rubric as a finished product but suggest that it be trialled across faculties for a sustained period of time, after which the strengths and weaknesses could be identified and appropriate improvements and adaptations made. Ultimately we want to provide a resource that will assist teachers in asking good questions because asking good questions is about teaching students to think, not what to think.

Sharing our research findings

WILL: I would be very happy to facilitate the presentation and to get input from others. I was very pleased with the results and proud to share our research.

LUKE: If others believe our research is going to be useful then I don't have a problem with distributing it. However, I think that there needs to be a different outcome for action research. I think there are other ways than a large written thing. I understand it is the formal process of academic activity, I understand the value of a paper, I understand the value of how that can help others. I didn't mind doing it; it took a lot of time but Will and I got in there and worked together. I just think that by having a more practically orientated conclusion may be more popular with other staff. If it will be used by others then I am all for action research.

Table 6.3 Generic Higher-Order Thinking (HOT) questioning rubric

Vogler ⇩ / **Krathwohl** ⇨	*Remembering*	*Understanding*	*Applying*	*Analysing*	*Evaluating*	*Creating*
Extended and lifting	What do …? Where was …? Who did …?	Why was …? How did …?	How does …?	Would this then …? How does this …?	What else had … When this occurred …?	How would you develop an idea that …?
Circular path	Why did …?	What did …?	How does …?	Could this be because …?	How does this tell us why …?	Write a story explaining why …
Same path	What does this …?	When could you …?	Where would it …?	How else could you …?	When does this …?	Create a mind map answering how …
Narrow and broad	When exactly was …?	Does this mean …?	If so, could this then be …?	Is it possible that this then …? In what way does this differ …?	Can we compare this with other …?	Make a list of questions that you feel have not been answered.
Broad to narrow	Have you heard of …? Do you know what …?	What do you understand to be …? When did …?	Take this example and apply it to …	Does it always …?	How else could it …?	Take what you have learned so far and produce an example that shows why …
Backbone of questions	Who is…? When is …?	What kind of …?	How old …?	What is the …? If this was … then how could …?	So how does this …? When else would …?	Design an alternative model that details how …
Bloom ⇨	***Cognitive memory***	***Cognitive memory***	***Cognitive thinking***	***Cognitive thinking***	***Divergent thinking***	***Evaluative thinking***

Summing up

A number of themes emerge across the research projects, including: the teacher-researchers' extensive and creative engagement with technology and the extent to which these technologies were assimilated into teachers' pedagogical practices; the capacity for regular school activities to disrupt research; and the transferability of the research findings across faculties.

There is evidence of extensive and creative engagement with technology in four of the seven projects and it is important to see this within the context of the introduction of the Labor government's 'digital revolution'. At Grange the laptop distribution was initially viewed by many teachers as 'a good idea but poorly managed' (Scanlon 2015, p. 99) because school laptops were rolled out without prior training for teachers. The action research initiative was used as an opportunity for the teacher-researchers in four projects to become not only familiar with the new technologies and use them in creative ways but also to adjust their pedagogical practices to these technologies. These teachers moved on from the initial use of laptops at Grange, which students complained were initially used as 'writing machines', mere substitutes for pen and paper note taking (Scanlon 2015, p. 99). The Grange action research results differ from the findings of Cuban et al. (2001), who found that teachers incorporate new technologies into their existing repertoire without significant pedagogical changes. At Grange there is clear evidence of pedagogical change amongst the action researchers. The teacher-researchers' activities also challenge the argument of Sheingold (in Mueller et al. 2008, p. 1524) that teachers do not take up technology because it takes five or six years to become competent with a particular technology and because technology changes so rapidly. The findings also reveal the use of multiple new technologies including smartboards, laptops, iPhones, Schoology, Edmodo, Facebook, YouTube – all of which necessitated some degree of skill acquisition.

A number of projects enumerated the advantages of technology for learning and teaching. Kathy and Barbara found that technology contributed to students' social skills, self-efficacy, team building, engagement, motivation, student leadership and friendships. Sophie and Nancy discovered that students in a lower-stream maths class, who had previously shunned repetitive pen and paper drill and practice in mathematics, did engage with mathematical apps because they were a more interesting and engaging way to acquire foundational mathematical skills. They also found that the more academically advanced class was less enamoured with drill and practice as the students already possessed foundational skills. Charles and Andy learned that while their students found videos useful, they were nonetheless reluctant to engage in a lengthy logon process. The research projects also highlight the limitations of technology, for example, the calibration problems with smartboards, websites with limited availability and incompatible software.

In recounting their research findings the action researchers reveal the extent to which school activities disrupted the research process and indicate the complexity of the school day. These were the kinds of unpredictable occurrences

that Wong (1995), in Chapter 2, found made being a teacher-researcher difficult, the occurrences which Wilson (1995); Bauman (1996); and Scanlon (2002) refer to, also in Chapter 2, as a necessary adjunct to being a teacher-researcher because they reflect the realities and complexities of schools. At Grange, timing within the school year appears as a significant disruptive factor, with most disruptions occurring in the second action research cycle, in the second half of the academic year. However, the teacher-researchers adjusted their research where such adjustments were within their control. Other disruptions which were not in the purview of the teacher-researchers included changes to the teacher-researchers' timetables, unavoidable absences of both students and teachers and the demands of their teaching and non-teaching roles within the school.

The research findings also indicate the extent to which action research projects conducted within one faculty were felt by the teacher-researchers to be applicable to other faculties. Cross-faculty application was the intended aim of Will and Luke's project; Charles and Andy, whilst not aiming for cross-faculty transfer, noted the possibility that their research might be useful to other faculties in subjects with a practical component; Lauren and Daphne's focus on examination skills and content could easily be adopted by other faculties in their senior classes. Overall, the multiple learning and teaching uses of new technologies highlighted across the projects have potential wide application within the school.

When the teacher-researchers were interviewed about sharing their research findings with their colleagues they expressed some nervousness. They did not, however, express the same degree of reticence with the wider dissemination of their written research report. There were those who simply found presenting to their colleagues challenging and others who were wary of the 'few sceptics' and the negative attitudes of some of their colleagues who had questioned the release time afforded to the teacher-researchers and to the funds expended on action research. Bartlett and Burton (2006) similarly reported that teacher-researchers were anxious about peer judgements. Another reason some teacher-researchers were nervous was that they felt their work was not ready for dissemination. They were all more relaxed about the dissemination of their written reports, suggesting that other teachers might find the research interesting or useful and as a result the gainsayers might consider the release time granted them had been worthwhile.

The thematic narratives of the teacher-researchers have now come to an end with this chapter. In the following chapter Amanda and Helen take us on their action research journey through a longitudinal narrative. The strategies they employed in their inquiry and their research findings became a springboard for a whole school literacy project, which is also explored in the chapter.

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7 From action research to whole school initiative

A case study

> I found just how much impact you can have and what a difference you can make as a teacher when you really put in the time and the effort.
>
> (Helen)

Introduction

This chapter reveals the potential of action research to transcend faculty boundaries and metamorphose into a whole school improvement initiative. To best illustrate this Amanda and Helen recount their research journey in its entirety, revealing their experiences in each of the waystations in a longitudinal tale, unlike the thematic narratives in Chapters 3–6. This action research account is a segue into a narrative of the resulting whole school 'Improving Literacy Project', the salient features of which are told in an extended interview, with Gillian as the facilitator of this initiative. The narratives in this chapter reveal the crucial role of the principal in supporting teacher research and valuing the knowledge emanating from this research.

Reading for Pleasure Is Reading for Life: Amanda and Helen

Amanda and Helen narrate each step in their action research project as did the action researchers before them, and this is followed by an interview transcript of Gillian's account of the subsequent whole school Improving Literacy Project.

Answering the 'call to adventure'

AMANDA: I've been teaching for 18 years and hadn't come across action research before and was trepidatious when the principal approached me. I was flattered but knew that there would be a lot of work so I wasn't duped into thinking that it was some gift that we were being given. It was going to be something that required time and thought and energy. But it was an

opportunity and I was quite excited and not doing it didn't actually come into my thinking at the time.

HELEN: I've been teaching for five years and while I understood 'research' I wasn't sure what the 'action' part of it was. When the principal asked me I felt rather privileged to be noticed and asked to participate considering that I'm fairly new to teaching. I could have declined but didn't think about doing so.

Our research issue and why we chose it

Interview extracts

AMANDA: We decided pretty early on that we wanted to focus on reading. Helen and I both had mid- to low-ability-level literacy classes in Year 8. We were concerned about the slide in NAPLAN [National Assessment Program – Literacy and Numeracy] results in reading between primary school and high school and we wanted to know why this happens and wanted to turn this around and try and stop this regression. We thought that sustained reading, immersion in reading, reading for pleasure might do this. Reading is so important as it is the basis for every KLA [Key Learning Area]; if students don't read well and understand what they're reading then this affects every subject.

HELEN: I think we had a bit of an idea about improving literacy but it wasn't until we were in the first workshop that we were able to start formulating ideas. The research issue came not only from our experience at Grange but also from the fact that Amanda and I both have children, boys, who read really well, who have a good level of vocabulary and write really well. We had become quite disheartened with our students who don't have this same level of reading or the same love of reading that our boys do. We feel that lack of reading is a big problem in our community; the love of reading has got lost and we can see the effect of this every day.

Excerpt from our action research report

Improving literacy and reading engagement in the early high school years was the aim of our action research project. Reading fluently enhances life skills and has benefits across the curriculum, increasing vocabulary, strengthening writing, improving spelling, enhancing social experiences, broadening general knowledge and improving self-confidence. The focus of our project was to engender engagement and encourage enjoyment of reading in 'at-risk' readers in the early years of high school. We believed that if students were provided with time to read appropriate, self-selected material in a comfortable, welcoming environment, reading acceleration would result. We selected two Year 8 classes, a total of 40 students. Class 8P had students with challenging behaviours as well as low literacy and 8L was a class with low levels of literacy. We recognised that to

develop a love of reading in a school like ours is a tall order, with motivation to read amongst our students at an all-time low. We believe that the reason for the decline in reading at Grange is the result of a number of factors: a technology-focused youth, a lack of parental role modelling and behavioural issues in class which distract students from developing a positive attitude to reading. Our aim was to instil in students the notion of reading for pleasure. Alongside the improvement in student literacy was the aim of improving teachers' pedagogy. By improving our teaching practice around literacy we are equipping ourselves with the strategies to unlock the doors on learning for our students and provide them with the tools to live their best life.

Preparing for the research journey

AMANDA: The workshops were a great opportunity to clarify our ideas and to go through the process of action research. Having the university partner was really important because she is very approachable and we could pick her brain. We took our time to go through the action research guide in order to grasp the process and the structure of this kind of research. We learned the kind of data that we would need to collect to be worth something at the end.

HELEN: The workshops opened my eyes to the action research process. I understood that it would be a lot of work, that it was a big commitment and that there were responsibilities because of the funding and the expectations at the end. The research guide was very helpful; it plotted the stages of research, how to achieve the end result, some steps to consider along the way and how to keep our research in hand so it didn't get out of control. It was comprehensive but it wasn't sort of weighty.

Interview extracts

We spent a lot of time trawling the Internet but didn't hit the jackpot until a colleague offered us her university library password, which gave us access to the kind of journals we wanted. We found searching and reading the literature time-consuming but we were interested in the issue and we learnt a lot, which we told everyone about, although no one was really interested, but we were. We were keen.

Excerpt from our action research report

We began our review of the literature by looking at the cognitive research which focuses on word recognition, phonetics, spelling and strategies for implementing this approach. However, we felt that the possession of these skills does not in itself ensure that students will read. The cognitive approach is only part of the puzzle because knowing how to read does not mean that someone will choose to do so. Amongst the findings from research on young people and reading we noted the following points:

- A growing number of young people do not read for pleasure.
  (Baker et al. 2000)
- When young people do not read their opportunities to learn decrease significantly. This then creates a vicious cycle in which poor readers become even poorer readers.
  (Baker et al. 2000)
- Boys read less than girls and children from low socioeconomic backgrounds read less than those from privileged backgrounds.
  (Clark and Akerman 2006)
- There are links between children's leisure reading habits and their academic achievement.
  (Hughes-Hassell and Rodge 2007; McKool 2007; Nippold et al. 2005)
- Reading as a creative activity engages the mind and encourages creativity.
  (Holden 2004)
- Reading accurately results in young people making meaning and connecting to real-life understandings.
  (Allington and Gabriel 2012a)

Based on our readings and on our own experiences we suggest the following reasons for the decline in student reading in high school: textbooks have high levels of 'formidable language'; reading instruction is often disconnected from content; students are expected to respond to reading with formal rather than personal reactions as they did in primary school; in high school lessons are more teacher-directed compared with the student focus of primary school; there is less social support from teachers in high school; students are encouraged to compete for grades and ranks at the expense of collaboration; there is a lack of flexibility in the choice of texts; and there is too much teaching to the test so that assessment determines content. The result is, we observe, that reading is associated with stress and anxiety.

From our reading of the literature we found the following suggested strategies for teaching reading and many of these we incorporated into our action research project: phonetics taught within a 'language-rich' classroom fosters positive attitudes to reading (Rose 2006); the importance of free choice in reading material (Allington and Gabriel 2012a,2012b; Guthrie and Humenick 2004); reading a range of literature (Guthrie and Humenick 2004); 'time for talking', that is, conversation with peers about what has been read improves comprehension and engagement with the text (Fall et al. 2000); switching between talking, listening, reading and writing allows students to make connections; and listening to a fluent adult read increases students' fluency and accuracy (Trelease 2001), improves vocabulary, background knowledge, sense of story, awareness of genre and understanding of structure (Samuels and Wu 2004).

We also consulted texts on action research (McIntosh 2010; McNiff and Whitehead 2011; Koshy 2010) and from our reading we understand that the main role of action research is to improve practice and to implement change for the purpose of professional development. It is a process in which the researcher identifies an issue, learns more about the issue through a search of the literature, develops research strategies, gathers and analyses data and acts on the information gathered. The particular advantage we see in action research is that it allows the researcher to pursue an issue of importance to them and thereby construct their own knowledge.

During our literature search we came across a brochure called 'Reading for pleasure: reading for life' developed by BookTrust (n.d.), a charity in the United Kingdom which encourages 'people of all ages and cultures to engage with books and the written word'. This brochure influenced our choice of title for our project.

Conducting the research

Interview extracts

AMANDA: We both had two Year 8 classes which we decided to use for our research. The advantage of this was that we knew the students we really wanted to focus on, the students who needed extra time and effort, to be nurtured a little bit more. We talked up the research with the students, emphasising that they were special to have this opportunity and they really embraced the project.

HELEN: We benchmarked students' reading abilities by looking at the NAPLAN results and working with the Leader of Literacy and Numeracy Improvement. NAPLAN has really good data and provides information on individual students; if anything, there is too much data when you are dealing with over 40 students. We conducted an attitudinal questionnaire and the Leader of Digital Pedagogy introduced us to SurveyMonkey and helped set up spreadsheets and create tables and graphs from our data.

Excerpt from our action research report

We decided that the method we chose had to be appropriate for the context in which we work and be incorporated into our daily practice. We selected our regularly timetabled Year 8 classes, both at the lower literacy level, for our research. We dedicated two one-hour lessons per timetabled cycle as a 'reading for pleasure' class. In this class students read self-selected material in a comfortable, welcoming environment in a designated section of the school library. The lesson deviated from traditional teacher-focused approaches in that we actively encouraged students to discuss content and share reading experiences with each other. This process aligned with action research which involves the researcher identifying an issue by reading relevant research, developing strategies, gathering

data and acting on the information. The specific advantage of action research is that it allows researchers to construct their own knowledge based on the issue they have identified. It is an advantage that teachers can work with students they know well. We believe the outcomes of our research will be useful not only to us but to our colleagues who may be able to extract principles and models from our project.

Cycle 1

We made systematic observations of the two, one-hour reading sessions each timetable cycle of two weeks in which students read silently for 40 minutes. Throughout this cycle students selected their own reading materials and shared their reading experiences with each other. We gave positive affirmation of reading success and included role-model reading and teacher reading. We collected data on students' reading habits and their attitudes to reading and based on this information we purchased current teen magazines such as *Dirt Bike*, *Wheels*, *Girlfriend*, *Art Attack*, *Better Homes & Gardens* and *Inside Sport*. Junior fiction and non-fiction were also available as were newspapers and journals. The boys tended to read standard 'boy-flavoured' genres of action, adventure, mystery and sport as well as newspapers, magazines and autobiographies. Girls preferred teen magazines, novels about relationships and at times picture books. Discussion amongst students was encouraged at the end of each reading session and we observed students talking about characters and plots in a way that revealed a deep level of engagement with their chosen text.

To maintain research validity we ensured that both Year 8 classes engaged in the same strategies targeting reading accuracy, fluency, engagement and acceleration. The only difference was that the 8L class had the support of Year 9 literacy mentors, who worked with individual students on grammar and spelling. In both classes every student had a language and spelling booklet and each was encouraged to work at their own pace either independently or in pairs. We used literacy games and spelling tests such as the 'Look, Cover, Write, Check' method. To further enhance our 'reading for pleasure' strategies we also included 20 minutes of quiet, student-directed reading and 10 minutes of literacy computer games in our regular lessons. There was also an excursion to the local library, which many of the students had not previously visited.

Cycle 2

At the beginning of Cycle 2 we found that systematic regular reading sessions and structured spelling and grammar sessions were becoming increasingly disrupted by other school activities such as curriculum and assessment schedules. Also the regular reading sessions in the library were often cancelled because at that time of the year the library was the venue for examinations. Also, as a result of timetable changes, the Year 9 students were no longer available as literacy mentors for 8L. Another change was the amount of time we spent on the project because we had

to pull back on the research to focus on syllabus content in our classes. In this cycle we used an 'interwoven model' with reading and literacy lessons interspersed with more syllabus-based work. There was also a change in the composition of the 8L class, with some students moved to other classes and new students joining. This caused some classroom management difficulties, exacerbated by the loss of a classroom teacher's aide. All of these changes were out of our control.

Reading for Fun Day

As a way to re-align both teacher and student attitudes to reading for pleasure it was decided to develop a 'Reading for Fun Day'. This was developed using a number of literacy-based activities and games and held in the school and in the local park. The day began with a 'Speed Dating with Books' session in which students on a 'musical chairs' circuit identified books they found interesting, added these to a 'like list' and borrowed these at the end of the session. This was followed by a team-based trivia/scavenger hunt designed to familiarise students with the library and its resources – a fiercely contested activity for prizes and certificates. Students then engaged in a creative reading photography session, taking photographs of each other reading in unusual, fun places and poses. These were shown on the school assembly to further encourage reading across the school.

In the afternoon there was 'Literacy Bingo', which utilised words based around authors, books and themes encountered during the term. It was a fast-paced session and encouraged word recognition and student engagement. The final reading activity of the day was a 'Readers' Theatre', in which teachers read a short story. The students completed an evaluation of the day and their responses were most encouraging and illustrated that an excursion need not be costly or time-consuming in order to have academic merit.

What we would change

AMANDA: I'd like to have changed the school disruptions because they made the second cycle a bit more arduous; however, these were out of our control. Also I had other things on as I was involved in other school initiatives. I felt like I have had a double whammy of things that I had to produce.

HELEN: In the second cycle we had to make changes because of changes in the school, not particularly because we wanted to change anything.

Sharing the research findings

Interview extracts

AMANDA: We saw an increase in students' confidence, self-esteem, reading ability and recognition that reading is important. I think it was something like 90% of kids in the final survey said they will continue to improve their reading and that it is an important skill for life.

HELEN: The impact on student-teacher relationships has been very positive. There were some behaviour problems in my class but with the project this has really calmed down. I feel that students have appreciated the opportunity provided by the project. I explained to them that they were involved in a research project and that their answers on the surveys would matter, that others would be interested and that they could possibly influence how Year 7 next year are taught reading. I discussed with them how teachers always tell them what to do and what we expect; now we would like them to give us their ideas. They really, really appreciated that and I was able to put their comments up on the smartboard for them to see. In terms of reading, students overwhelmingly enjoyed the process; they felt more confident as readers and would have liked more reading time. I also learned a lot about my students; for example, until they were benchmarked even though I knew students had low-level reading ability, I really had no concept that there were students in the class who had a reading age of five years old. That was an eye-opener.

Excerpt from our action research report

Our results show that regular reading is required to maintain and improve students' literacy skills. We found that reading improves with continued support and with time allocated for reading in class. We were pleased with the quantitative data. All pre- and post-testing was done by the Leader of Literacy and Numeracy Improvement. Below we separately report our research findings for the two classes.

Cycle 1 8L

Overall students responded well to a range of strategies to foster reading engagement and improve literacy. Regular trips to the library appealed to students mainly because of the free selection of reading materials. Students were highly engaged with our learning and teaching strategies during the initial sessions and were mainly self-directing during the spelling and reading sessions, but if they had difficulties they looked to the Year 9 mentors for assistance.

Students' reflective statements and questionnaire responses indicated that 80% of students valued the literacy strategies. Students commented on wanting to improve their reading and believed that reading was an important life skill. Seven out of 10 students valued the time spent on spelling and grammar and the overall theme that emerged from Cycle 1 is contained in this student statement: 'Now I can learn more things.'

Cycle 2 8L

The pre-testing, using the PM Benchmarking[1] scale, revealed that students had a reading age ranging from 9 (five years of age) to 30 (12 years of age).

Table 7.1 Class 8L pre- and post-project reading age and accuracy

Name	*Pre-project reading level*	*Pre-project reading accuracy*	*Post-project reading level*	*Post-project reading accuracy*
Charles	9	93	30	91
Frank	17	95	24	95
Ron	26	93	27	96
Pauline	27	95	30	95
Tammy	18	95	21	90
Zara	30	99	29	95

The average reading age was 25.4 (nine years of age). There was significant growth in the reading age of students as a group, who now had an average level of 28.2, which was an increase of between one and five years. Some students showed an even higher growth; for example, Cameron went from a level 9 to the top level with an accuracy of 91%. Two girls jumped six and seven levels with an improvement of 2.5 years. Overall the data analysis revealed that accuracy remained static with the increase in reading age, which was particularly pleasing.

The qualitative data showed that students were more confident and positive. The Leader of Literacy and Numeracy Improvement who administered the post-benchmarking commented: 'There is a marked confidence in reading ability regardless of improvement level. Students said they were now better readers and in the post-benchmarking were prepared to discuss the meaning of words with me, which they were reluctant to do in the pre-testing.'

An overall improvement in student efficacy had a flow-on effect and resulted in a more positive classroom environment. The students appreciated being included in the project and seemed to feel that their teacher contributed something distinctive to their class. Table 7.1 is an example of the pre- and post-benchmarking of six students from the literacy class using the PM Benchmarking scale.

Cycle 1 8P

The pre-testing for this class was also completed by the Leader of Literacy and Numeracy Improvement and we found that the reading range of 23–30 was narrower than expected. This, however, was offset by difficulties noted in accuracy, which ranged from 95% to 100%; over time accuracy improved. We found that the boys were more engaged than the girls, which is not reflected in other current research literature. The boys were much more enthusiastic and it was their positive influence that eventually helped the girls get back on track. At the conclusion of Cycle 1 students said they were pleased with their progress.

Throughout our research, peer-generated conversations about their reading developed and we observed an increase in students' self-confidence. The library environment played a role in students' enjoyment of reading as judged from the qualitative data we collected: 'I really liked the quiet of the library'; 'Library lessons were the best'; 'It was really relaxing to have quiet time.'

Cycle 2 8P

The final survey showed that the 'interwoven model', which combined reading and literacy lessons with more syllabus-based work did not deter students from focusing on reading. The data reveals that 70% of the students felt that their reading had improved and 85% indicated that they would like time to continue reading for pleasure in the future. The final results also indicated that the girls were now more positive compared with the small pocket of resistance at the beginning of Cycle 1. Students' comments on their reading included: 'I feel smarter'; 'I understand the meaning of more words'; 'I can read more quickly.' A by-product of the research was an increase in students' confidence.

The final post-benchmarking showed that in 8P, which had begun with a higher literacy level than 8L, there were no dramatic improvements; however, the majority of students showed some improvement in reading accuracy. Most students retained the highest reading level (30), with the remainder trending up from level 28 to 29.5. Accuracy was maintained at a steady 97%; this was a pleasing result considering the challenges in Cycle 2. Only two students trended down slightly from 30 to 29. This was attributed to an attitudinal change evidenced from interviews with parents and teachers and was found to be consistent for these students across all KLAs (Key Learning Areas). The most improved was a student who increased from 23 to 26, a jump in reading age of two years. A small number of students attained a single-level increase. The slow and steady growth that occurred supports our initial belief that regular reading contributes to the maintenance and improvement of literacy skills. Our research suggests that success in reading will eventuate with continued support and time for reading in class.

The most pleasing results were in student attitude and self-esteem revealed in students' eagerness to read out loud, their acceptance of reading as part of the regular classroom routine and the increased positivity in the class. Students' work ethic improved along with the atmosphere in the classroom. Students' attitude shift was the major result of the research. Prior to the project students were reluctant to answer questions in class and to give their opinions.

Students expressed gratitude for their inclusion in the research. The data from SurveyMonkey was displayed on the smartboard and shared with the class and this gave formality to the project and students felt empowered with the knowledge that their responses were valued and would be given consideration when developing future literacy programmes. 'I really like it when they ask us what we think', one student remarked. Table 7.2 is an example of pre- and post-benchmarking of six students from the behaviour class.

Table 7.2 Class 8P pre- and post-project reading age and accuracy

Name	*Pre-project reading level*	*Pre-project reading accuracy*	*Post-project reading level*	*Post-project reading accuracy*
Carl	30	100	29	99
Jane	23	96	26	96
Graeme	29	96	29	98
Warren	30	97	29	98
Vince	30	96	30	95
Sally	30	95	30	94

Sharing our findings

AMANDA: A little bit overwhelmed but it will be OK because we think that what we have done is really important so we are happy to share it. We are happy to say to those people that maybe think we have just had all these days off and made comments to us like, 'Hasn't that been nice for you!' that we have actually done something and it has made a difference. We have great results and I want to share that. I don't know how many people will read it but it is nice to think that it is going out there.

HELEN: Other teachers on the action research team really saw the value in what we have done and thought that it was quite amazing and that the ideas we had were really valuable. There are some members of our faculty who feel that they would like to implement something similar but I don't think everybody sees the value of it. I feel OK about presenting to the whole staff. I think that it will be beneficial for them to see the enthusiasm that Amanda and I have for our project, and because the data we have to share looks really good.

What next?

What we wanted to see when we finished our project was a whole school approach for reading, not just in English but for all teachers to create time for reading for pleasure. It might only be once a week, one lesson where we just say, 'OK this is where you get to go and choose a book from the library, get to sit in a quiet space and have a chance to read what you would like to read.' And, in fact, following conversations with the principal and the Leader of Literacy and Numeracy Improvement, many of our strategies have been adopted across Years 7 and 8. Each faculty is creating KLA relevant materials for a whole school literacy project and this unification of effort we believe is the linchpin to success in our drive to improve reading and comprehension skills in our students. This new school-wide programme, Improving Literacy Project, was launched off the back of our action research and will be coordinated by the

Leader of Literacy and Numeracy Improvement situated in the library, with revolving faculties overseeing the implementation. So the action research project will continue, modified and unofficially, with the support of the current principal.

Improving Literacy Project

In this section of the chapter we leave the action research narratives and the teacher-researchers, who have now resumed their roles as classroom teachers. The interview transcript below is a composite of three interviews with Gillian conducted by Ann, who also conducted the reflective interviews with the teacher-researchers, extracts of which appear in Chapters 3–6. In the transcript Gillian, the Leader of Literacy and Numeracy Improvement, talks with Ann about her teaching background, her definition of literacy, why she believes students have literacy problems and her preferred strategies for improving literacy. Gillian also outlines the strategic links between the whole school Improving Literacy Project and the Reading for Pleasure Is Reading for Life action research project, and explains the strategic approach of the whole school literacy project including examples of student literacy improvement.

ANN: Hi Gillian. Thank you for agreeing to do this interview on the Improving Literacy Project. Before we talk about the project, let's talk a little about your teaching background and your role as Leader of Literacy and Numeracy Improvement.

GILLIAN: I'm K-12 trained and I've taught in primary schools and high schools, mostly in low socioeconomic communities. For the past 18 years I've worked in learning support and for part of that time I taught here at Grange High.

ANN: You've recently come back to Grange in a new role. Can you explain that role to me?

GILLIAN: In my role as Leader of Literacy and Numeracy Improvement, I predominately work with teachers across all faculties. This is a new head teacher role created by the principal and is very different from other head teacher roles which are faculty-specific. My role statement is primarily to team-teach across all faculties, look at programmes and assessments and align these with the *Quality Teaching Framework*, with the aim of improving literacy and numeracy. I see the point of my role as making whatever I do sustainable, not to have teachers dependent on me, to set things in place and then fade away, ensuring that everything will continue.

ANN: That sounds like a very different and challenging role. How have you approached the role?

GILLIAN: I'm not the first person to hold this position and I know that previous appointees had some difficulties being accepted within faculties because of the subject nature of high schools and also because they were strangers to the school. I have the advantage of coming back, not coming in new, and this gives me some credibility and so most people are willing to listen

to what I have to say. My approach has been just chipping away, changing things by stealth, no front-on faculty assaults. It seems to be working.

ANN: Let's move on to literacy. Can you tell me what you mean by literacy?

GILLIAN: Literacy is reading, writing, speaking; it is how we operate as human beings, how we speak in the community, how we speak in formal situations, how we write in formal situations, how we text on the phone – it's all of these things. As teachers we have to acknowledge to our students that there are traditional forms of literacy such as the writing of resumes and then there is the literacy used on Facebook; there's literacy for different purposes. If you are not literate, life can be pretty hard. In a high school I believe that the English Faculty should take leadership and ownership of literacy, but ultimately literacy belongs to the whole school.

ANN: How do you identify the students who needed literacy support?

GILLIAN: There are a number of sources of information on students' levels of literacy. At Grange, the principal has established a close relationship with the feeder primary schools and they provide us with literacy data when students enrol in our school. Then once they are in high school there are two key sources of information – the classroom teacher and the NAPLAN results. Sometimes parents alert the school to their child's literacy problems.

ANN: What do the NAPLAN results reveal about literacy at Grange?

GILLIAN: I estimate that 70% of students at Grange require some literacy support. The NAPLAN results reveal a big dip in results between Year 7 and Year 9 and anecdotally the dip is explained in the huge jump in academic expectations from Year 5 to Year 7 and the fact that students may not have been extended enough in primary school.

ANN: What does the school do with the NAPLAN data?

GILLIAN: These results are analysed by the literacy and numeracy committees, which is great, but what is more important is how we go forward with that analysis and how we tease out the nitty-gritty of the sorts of things we could implement to go forward. One thing that really needs addressing is that literacy is not explicitly taught in Years 7 to 9 because secondary teachers consider literacy is assumed knowledge dealt with in primary school.

ANN: You've worked in learning support and literacy for some time. Have you come to any conclusions [as to] why some students have literacy problems?

GILLIAN: Students may have literacy problems for a number of reasons such as a reading disorder, an understanding or communication problem, a comprehension problem, problems with fine motor skills and hence with writing. Sometimes it's that they started school too early and their behaviours prohibit them from settling. It can also be that learning is not valued in the home and that there are literacy problems in the home. Often literacy is valued, but in our community if you are struggling just to pay the rent or pay the house off or buy food, literacy is the last thing on your mind.

ANN: Tell me a little about your approach to teaching literacy.

GILLIAN: There are many good programmes to improve literacy; however, many of these require students to be withdrawn from regular classes. I would

like to see students remain in class where I can work with teachers on their literacy strategies. I want to ensure that every element of teaching has a literacy component. I think it's very important to contextualise literacy strategies. There is no point giving students lots of NAPLAN revision exercises; they will mean absolutely nothing to them. Doing literacy within the context of students' normal classroom work is what makes the difference. One of the myths about students with literacy issues is how difficult it is to teach them. However, I've a really strong belief that we can raise students' literacy standards and I get tired of hearing staff saying, 'What do you expect with the cohort we are given?' It is important for teachers to have very high expectations of students.

ANN: OK, now let's talk about the Improving Literacy Project. I understand that this project adopted some of the strategies used in the Reading for Pleasure Is Reading for Life action research project.

GILLIAN: Yes, there were conversations between the principal, Amanda, Helen and myself and we did incorporate some of the strategies from their action research project into the whole school initiative.

ANN: Can you give me an example of some of these strategies?

GILLIAN: I suppose the most obvious was the approach of both projects to literacy through reading. Under that umbrella approach, the two projects had in common such strategies as targeting reading accuracy and fluency, designing a special workbook for the classes, using literacy games with a grammatical focus, giving positive affirmation, modelling reading to students and encouraging students to share their reading experiences with each other.

ANN: What were the particular characteristics of the whole school Improving Literacy Project sessions that you facilitated?

GILLIAN: Previously, students with literacy problems were placed in special literacy classes, whereas the approach in the whole school project was to teach literacy within the KLAs of English, science, history and geography with literacy instruction embedded within syllabus content. To prepare for this, before we began the project, the principal gave teachers from these subjects release time to develop authentic subject-specific literacy texts. In some cases faculties also purchased appropriate materials.

ANN: How often did these KLA-specific sessions take place? If I came into a session what would I see?

GILLIAN: The project ran for a year and during that time there was one class a fortnight for each of the KLAs involved. What would you see? I describe the classes as having a saturation of teachers; there was a subject teacher, a librarian, a learning support teacher and myself. As well the principal and deputy principal, each dropped in to every session. The sessions were very structured so that students couldn't fly under the radar; there was no way out of the class activities, but they were fully supported. Each student had a KLA-specific workbook which explicitly related literacy to syllabus content. In the sessions the students first read silently from the workbook as teachers moved around to assist them. Following the reading students worked

through a number of related activities and a comprehension. Once a session each of the teachers listened to six students read and the principal and deputy principal listened to one student each.

ANN: How did the teachers react to teaching subject-specific literacy in this way?

GILLIAN: At first staff were concerned about the loss of syllabus time but after three or four weeks they could see students' improvement and found that the literacy lessons enhanced the syllabus lessons. There were also teachers who were nervous about teaching the grammar component. So when required I provided scaffolding for these teachers, so the project was an opportunity for incidental professional development and teachers said they learnt a lot.

ANN: Why were there teachers who were nervous about teaching grammar?

GILLIAN: Over the years there have been different approaches to teaching English in schools and for some time grammar has not been routinely taught. The result of this is that many teachers missed out [on] learning formal grammar at school and were also not prepared in their teacher training courses to teach grammar.

ANN: So how did you determine the success of the project? Did you collect data on student progress?

GILLIAN: I collected extensive data from all 77 students in the project. I benchmarked each student's reading level before the literacy classes began and then collected data on three different occasions over the duration of the project using the PM Benchmarking Kit.

ANN: What did you find?

GILLIAN: Before commencing the initiative I used the Australian-developed 'TORCH'[2] reading assessment test to determine students' reading ability. I found that 30 students were performing below expectations, but after six months only three students were below expectations. Overall the results were absolutely outstanding; of the 77 students only six students didn't progress and one regressed. I've given you a copy of a data sample (Table 7.3) to show students' reading level before the literacy initiative and the results of three benchmark activities over the year the initiative ran.

Table 7.3 A sample of student reading improvement

Name	*TORCH test benchmark*	*PM 1*	*PM 2*	*PM 3*
William	Well below	25	30	30
Lauren	Well below	25	27	30
Samuel	Well below	26	28	30
Harry	Below	24	26	30
David	Below	25	30	30
Mary	Well below	28	29	27

As the initiative progressed benchmarking activities were something students looked forward to and there were students asking when was it their turn because they wanted to show me how well they read. Once students knew the routine, it was brilliant.

ANN: These are very impressive results. So why is the project no longer running at Grange?

GILLIAN: This was a home-grown project; it did not come off the shelf and it worked well for the school and our community. Teachers put in lots of work and there was lots of excitement for the project – it was great. There is no reason this model couldn't be replicated year after year. All the work was there and I understand that the principal Francis James had factored teachers' time into the staffing formula so that the project could continue once the federal funding ceased.

ANN: So what happened?

GILLIAN: Francis James retired and the incoming executive had a different idea of what my job should be. Francis James, when he created my position, structured it so that I wouldn't be confined to one particular faculty or to one particular classroom. However, with the change of executive my role reverted to that of teaching in one classroom and this meant that I could no longer team-teach or scaffold teachers in KLA-specific literacy strategies. This meant that the indirect professional development simply ceased with the literacy project.

ANN: Thank you, Gillian for sharing the details of the literacy initiative.

Summing up

The Grange action research project Reading for Pleasure Is Reading for Life and the whole school Improving Literacy Project were directly linked to federal government education policies. Amanda and Helen's selection of a research issue was partly a response to evidence from NAPLAN results which revealed the regression in student literacy in the middle years of high school and the generally low literacy levels of Grange students. Rather than address this by adopting a teaching-to-the-test strategy, a not uncommon response to high-stakes testing which Berliner (2011) suggests is a rational response, they instead sought to improve student literacy by promoting reading for pleasure. The Improving Literacy Project was driven by the school NAPLAN results and the inclusion of Grange in the *National Partnerships on Low SES School Communities (2009–2015) Scheme* funding. It shared with the action research project Reading for Pleasure Is Reading for Life a focus on literacy improvement through reading.

Reading for Pleasure Is Reading for Life

The selection of a research issue for Amanda and Helen arose from within their own pedagogical practices, their knowledge of students and the local community and their experiences with the reading abilities and attitudes of

their own children. Their research journey reveals themes similar to those found in the journey of the other Grange teacher-researchers highlighted in Chapters 3–6. The 'call to adventure' left them feeling 'flattered' but 'trepidatious' because of the workload. They found the workshops a valuable preparation for their research as well as reinforcing the significance of their choice of research issue. They, like their researching colleagues, were also reliant on non-researching colleagues for access to research articles. Moreover, their research was also interrupted by school activities and their other non-teaching school commitments.

Reading, for the teacher-researchers, was the gateway to a better life, particularly for students within a low socioeconomic school and community and this approach is supported by extensive educational research in the area of reading. Reading for pleasure has become something of a catchphrase adopted in numerous research publications. For example, Amanda and Helen connected notions of a better life to reading for pleasure, which resonates with Halpin's (2008, p. 380) comment that 'as teachers, we cannot afford *not* to legitimate the role of reading for pleasure in our classrooms'. Another example is research by the Institute of Education, University College London (2015, p. 4), which found that reading for pleasure was more significant for young people between the ages of 10 and 16 than the level of education of their parents: 'The combined effect on children's progress of reading books often, going to the library regularly and reading newspapers at 16 was four times greater than the advantage children gained from having a parent with a degree.' Wilhelm (2016, p. 38) notes that 'pleasure reading is an underutilised tool for addressing issues of social equality and opportunity and should not be neglected by teachers'. When young people also have the opportunity to engage in 'freely-chosen reading', it results in 'five distinct kinds of pleasure: the immersive pleasure of play, intellectual pleasure, social pleasure, the pleasure of functional work, and the pleasure of inner work' (Wilhelm 2016, p. 31).

The Reading for Pleasure Is Reading for Life project was collaborative on a number of levels. As well as working in a collaborative partnership Amanda and Helen also sought the advice and support of the Leader of Literacy and Numeracy Improvement, who facilitated the literacy benchmarking of students in the two classes chosen for their action research project. They also consulted the Leader of Digital Pedagogy, who assisted them in the use of graphs and spreadsheets for data analysis and display. As well, students were seen as research partners, their opinions being actively sought through surveys, evaluations and discussions.

The data from this project revealed that the research strategies resulted in a substantial improvement in student reading, sufficient enough to provide the impetus for the Improving Literacy Project. Both teacher-researchers were happy with the dissemination of their written report and like other action researchers hoped that their findings would allay the fears of some of their non-researching colleagues who felt they were taking too much time away from face-to-face teaching.

The Improving Literacy Project

In the extended interview with Gillian, Ann ascertained Gillian's professional background and approach to literacy before moving on to the whole school literacy project. In this way, the impact of Gillian's professional biography and educational beliefs foregrounds her approach to the literacy project she facilitated. Gillian's biography has an important bearing on her work at Grange because, as she herself explained, she was 'coming back, not coming in new', which signalled to her Grange colleagues that they had a shared understanding of the students, the school and community. However, there was not initially a shared understanding of the possibilities of improving students' literacy. Gillian's education beliefs are highlighted in her inclusive construction of literacy as 'what we do when we are living, we are reading, we are writing, we are conversing' and in her view that literacy should be embedded within subject disciplines in secondary school. This approach is resonant of Moje et al. (2000, p. 166): 'Literacy events are acts or moments that involve reading, writing, speaking, and performing many kinds of texts, but these acts or moments are situated in specific social, cultural, historical, and institutional contexts and are engaged in for specific purposes relative to those contexts.' Gillian's concept of literacy is reflected in the structure of the Improving Literacy Project and the strategies employed to position literacy learning and teaching within subject-specific contexts in which teachers were also learners – an approach different from that of the experts encountered by Jones and Chen (2012, p. 156), who described their literacy teaching at 'word, sentence and text level'.

The Improving Literacy Project highlights the problematic nature of literacy teaching and learning in secondary schools. More than any other debate about teaching and learning, it is the differing opinions of scholars regarding how literacy should be taught that has had a direct impact on more secondary teachers than any other debate. This is because all teachers are deemed to be teachers of literacy as the following extract from the NSW Literacy policy statement reveals: 'NSW Teachers K-12, across all Key Learning Areas, are responsible for the teaching and learning of literacy skills, knowledge and understandings' (NSW Department of Education and Communities, 2017, s. 1.2.6). However, it is clear from the research on literacy teaching, and from comments by teachers at Grange, that many secondary teachers feel unprepared to teach literacy within their designated subjects. A reason for this is that debates in the academy around literacy teaching, the so-called 'literacy wars', have had, and continue to have, a direct impact on teachers' day-to-day classroom practice.

Over time, departments of education have adopted specific approaches to literacy teaching (such as the whole language approach) and when this happens these become powerful didactic pronouncement to teachers, the latest 'silver bullet' to be adopted in all schools. This then has a widespread impact on cohorts of students and teachers. An example of this impact is evident when

we consider that the 'systematic teaching of grammar has been absent from Australian classrooms for two or more generations' (Jones and Chen 2012, p. 148). An emphasis on grammar has recently been resurrected and many teachers find that the whole language literacy approaches in their own school education and teacher preparation courses have left them with insufficient grammatical knowledge and skills to teach this component of literacy within their subject areas. It is not only the grammatical component for which teachers feel unprepared, it is also the explicit teaching of literacy within their designated subject area that concerns many teachers. Gillian discovered this at Grange and Fenwick (2010, p. 269) also found that in Australia the majority of teachers do not feel they have the knowledge or skills to teach literacy, which is mirrored in the United Kingdom, where most teachers do not regularly include explicit literacy teaching in their lessons.

Not only did many of the Grange teachers feel ill-equipped to teach literacy but Gillian found that secondary teachers generally consider literacy teaching the role of the primary teacher. She discovered that secondary teachers regard literacy as 'assumed knowledge' when students enter high school. This is similar to the 'vaccination' model in which literacy instruction is perceived to be confined to the early years of schooling (Shanahan and Shanahan's 2008, p. 46).

The subject-based nature of secondary schools (May 2007, p. 388) can be an impediment to the successful development of a whole school approach to literacy. This is reinforced, May and Wright (2007, p. 372) suggest, in the current environment which 'demands almost immediate, quantifiable results with respect to changes in student achievement'. However, the teaching of subject literacy is critical in secondary schools, according to Shanahan and Shanahan (2008, p. 57), because of the increasingly difficult nature of subject-specific language as students move through to the higher grades of secondary school. Wilson et al. (2017, pp. 74–5) remind us that subject-specific texts have

> characteristics that present readers with different challenges and require subject-specialised as well as generic skills and knowledge. … Given the increasingly complex texts students are expected to read in the subject-areas, students need to develop knowledge about the complex vocabulary, structures and language features of specialised text types.

According to O'Brien et al. (1995, p. 448), 'the secondary curriculum is based on the assumption that knowledge can be objectified, verified, and disseminated via compartmentalized disciplines'. This, they argue, reflects a positivist epistemology, the goal of which is to transmit knowledge and to inculcate certain discourses. The Grange literacy initiative was able to overcome these difficulties in the short term as teachers were mentored on strategies to embed literacy within their subject areas through locally designed learning and teaching materials.

The inclusion of the school principal in the literacy sessions signalled to staff and students the significance of literacy and of literacy improvement as a whole school responsibility. A comment made by Ioannidou-Koutselini and Patsalidou (2015, p. 137) regarding the role of the principal in action research applies to the principal's role in the Grange literacy initiative, 'valuing, facilitating and supporting action research at the school level, visiting the classes as a peer friend, and genuine reflection with the project participants were among the conditions maximizing teachers' benefits from their involvement in an action research procedure'.

May (2007, p. 390) points out the difficulty of sustaining 'changed literacy (and wider learning and teaching) practices over time, particularly in light of changes to staff and other PD [professional development] emphases within schools'. Both of these changes occurred simultaneously at Grange, resulting in the discontinuation of the Improving Literacy Project. Whilst the short-term results of the project were 'considerable', a claim supported by systematic data collection and analysis, it was nonetheless discontinued following a change in the executive, or as one teacher phrased it, 'It was canned.' However, Taylor et al. (2005, p. 64) emphasise the importance of a long-term approach and observe that any substantive change takes place incrementally – there are 'no quick fixes and no magic bullets'.

The action research project Reading for Pleasure Is Reading for Life, along with the Improving Literacy Project, highlight the key role of the school principal in constructing teachers' work within the local school context. Francis James was the key figure in both initiatives through his policy enactment and construction of teachers' work. When he retired executive support for the Improving Literacy Project was withdrawn and the initiative came to an end. This is not to say that the incoming executive was less interested in literacy, rather that with the change in leadership different notions of the role of the school-based literacy expert came into play. The original role description of the Leader of Literacy and Numeracy Improvement, which included team-teaching, mentoring and scaffolding teachers in subject-specific literacy strategies, now reverted to a more traditional construct of teachers' work as classroom and faculty delivery of syllabus knowledge.

Fenwick (2010, p. 281) found it was necessary for the school leadership to support literacy initiatives. This is particularly so when the approach is whole school, requiring cross-faculty cooperation. Perhaps, as Leeman and Wardekker (2014, p. 55) observed from their experience of action research, and I suggest this may well be applied to other initiatives such as that at Grange, that it is 'okay', providing initiatives do not become a 'nuisance' to the school executive. The improvement in student reading and comprehension carefully researched and documented by Gillian was, however, sufficient for this approach to literacy to be adopted by a neighbouring school.

The tales of the research journeys have now come to an end. In the final chapter of the book I report on what the teacher-researchers described were the principal impacts and implications of their action research experiences.

Notes

1 PM Benchmark Kit 2: This is a comprehensive assessment tool designed to explicitly assess student instructional and independent reading levels. (Provided by the teacher-researchers)

Level	*Reading age*
0–14	5.0–6.5
15–16	6.5–7.0
17–18	7.0–7.5
19–20	7.5–8.0
21–22	8.0–8.5
23–24	8.5–9.0
25–26	9.0–10.0
27–28	10.0–11.0

2 'Tests of Reading Comprehension Third Edition (TORCH-3) is a best-selling Australian assessment tool designed to assist teachers in their assessment of Year 3 to Year 10 students' reading comprehension skills. TORCH provides an estimate of a student's level of reading achievement' (Viewed on 13 April 2014, https://www.acer.org/files/PATM-Interpreting-Scores.pdf).

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8 Impact and implications of the research

> I think it is very beneficial for the school being able to have something solid and be able to say, 'Yes, we do invest in our teachers' professional learning and in our students.'
>
> (Valerie)

Introduction

In this final chapter, I again draw on the reflective teacher-researcher interviews and this time explore what they saw as the impact and implications of their action research journeys. The teacher-researchers explain the impact on them of their research experiences, which enabled them to make connections with their colleagues, with their students and with the research literature – connections which were qualitatively different from those in their day-to-day practice as teachers. Comments made to the action researchers by their non-researching colleagues highlight the degree to which the research did not accord with the construct of teachers' work as generally conceptualised at Grange. In light of their research experiences and comments made by their non-researching colleagues, the action-researchers talk about the considerable funds expended on the research projects. Research was a new experience for all but one of the teachers at Grange and they share with us their understandings of action research following their research experiences. Did the teacher-researchers' construct of teachers' work change as a result of their action research? To find the answer to this question the teacher-researchers were asked two related questions: Would you carry out action research again? Would you undertake a research degree? The chapter concludes with my final brief comments on the implications of the action research at Grange for thinking differently about teachers' work.

Making connections

Van Manen (1977, p. 206) highlights the largely uncritical and unreflective nature of teachers' 'every-day work', the world of practice which 'expresses itself in the routines or taken for granted grounds of daily activities'. The action

research at Grange High afforded the teacher-researchers the opportunity to step outside their daily routines and to make connections with their pedagogical practices, with their colleagues and students and with the educational research literature in ways hitherto not possible.

Connecting with practice

Andy's account of the impact of action research on him highlights facets of the contemporary world of practice:

> I think I have changed. I think you do change as a teacher but it might move in peaks and troughs. You have times where you can really focus on what you are doing and then you get snowed under and you start running again. The action research has made me reflect a lot more about what is happening in the classroom. At first teaching seems pretty easy, you leave uni and you are set on being a reflective teacher. But it's pretty easy to lose sight of that and just get through day-to-day, just being ready for tomorrow instead of spending time looking at what is working and what isn't working in the classroom and what can be done better. I found the action research worthwhile and rewarding.

The ideal of reflective practice which underpins teacher education programmes quickly recedes as the teacher becomes 'snowed under', starts 'running' and 'just makes it through day-to-day'. Amanda provides a very similar portrait of teachers' work where

> so often you get stuck in a rut of repeating the same thing because it is quick, it is easy and you have got it to hand. You get so bogged down in your school faculty world you don't see what other people in other faculties are doing.

There is here the underpinning notion of struggle emanating from the teachers' contractual obligations, with the result that sometimes they forget, as Daphne said, 'that content isn't the most important, it isn't the be all and end all', with the caveat: 'but then you know you still have to get through the content so it is a fine line'. Lillian graphically captures the impact of the syllabus tyranny:

> We smash out all this content, content, content, learn it, learn it, learn it, then test, test, test. So you just kind of go with what you know. But action research gave me a space where I could actively learn and process things and take them to the next level. I moved out of my comfort zone, tackling something that I thought perhaps I wouldn't be up for.

Kathy spoke about the 'opportunity to get time off from face-to-face teaching to focus on something that might make it better for me in the classroom so I

could make a difference to students'. Charles realised that 'what I am now doing is simply not good enough' and for Amanda action research added 'a bit more vigour to the job'.

Connection to practice for many of the teacher-researchers meant focusing on technology, which was largely a result of the 'digital revolution' which saw the distribution of laptops to all Year 9 students and increased funding, making, for example, the installation of smartboards possible. The result was that many teachers were concerned about the inclusion of new technologies into their practice. Daphne explained that through action research she was able to reflect on the use of technology and 'its benefits for my students; I now feel more comfortable with the new technology'. Andy similarly became more 'interested in using technology in workshop classes and I'm keen to see if I can get kids sharing lesson content on their iPhones'. Lillian's increased confidence with technology encouraged her to 'tackle something in the syllabus I'd been putting off'.

Action research gave the teachers the time and space to reflect on their pedagogical practices. In doing so they paint a portrait of contemporary teaching as one of struggling to accomplish contractual obligations entrapped by syllabus constraints as they daily balance 'juggling' against the danger of being 'bogged down'. The result for these teacher-researchers, prior to their action research, was what Lortie (1975) calls 'reflexive conservatism' and Berger and Luckmann (1966/1991) call 'recipe knowledge', that is, doing as usual bereft of innovation and experimentation.

Connecting with colleagues

Connecting with colleagues in secondary schools is made difficult by the busyness of the teachers' day and the balkanised nature of secondary schools, separated as they are into subject-specific faculties, the separation of which is frequently reinforced by the architectural design of schools. The action research project enabled the teacher-researchers to break down the barriers between faculties and become part of 'a bigger picture' in terms of an extended collegiality, not only with their faculty-based research colleagues but also with both researching and non-researching colleagues in other faculties. This connection is graphically illustrated in Lillian's account of her experience:

> What was really fabulous was to be part of a big picture to be able to learn from others at our school, to see some amazing action research projects, to know that there are other people who are thinking along the same lines. I was just blown away to see the calibre of people in our profession at this school who are very gifted and very involved with their learning. I wouldn't have seen it unless I was part of this project. It reinforces why we are here and who we are. That gets a bit lost in chasing children around the playground trying to get them not to steal the chooks from the farm and take them to another classroom and annoy another teacher and have me harassed. I like going back to academia and I like to

> think that I was part of this bigger process of thought, just at a school level. That was healthy.

This extended collegiality is not confined to the experience of the Grange teacher-researchers, which echoes Peters' (2004, p. 551) finding that action researchers became aware of their 'colleagues' thinking and practices'. Connecting with the school community beyond their own faculties also prompted the teacher-researchers to consider the possible broader application of their research to other faculties.

Connecting with students

As well as being better connected with their colleagues, the teacher-researchers also commented on being better connected with their students and thus more sensitised to students' individual needs. For example, Nancy described herself as 'a real maths person' who previously could not understand why students 'didn't get maths, it is just so simple. I think the research has made me think that it isn't so simple for some students.' Kathy felt the action research 'helped me to relate better to the kids, to individualise each student and the way they learn and how different it is to when we were at school'. Sophie was also more alert to the needs of individual students:

> It makes you realise how difficult some kids find basic concepts, and how much you do expect of them. It was an eye-opener to see some of the struggles they have and it has made me a little more realistic and brought me down to their level to see their needs.

Helen similarly felt she needed to reassess her 'expectations of students' after discovering the range of reading ages of the students in her class. Grange teachers were not alone in making these connections, as Peters (2004, p. 551) similarly found that through action research, teachers became more aware of the way their students learned and this in turn made them rethink their pedagogies.

Connecting with the literature

Connecting with the educational world outside of the school through reading academic research literature was for many of the teacher-researchers a reaffirmation of their own practice. Amanda said that the action research 'has given me a literature basis to refer to; it has really reinforced what I believed as a gut feeling'. Similarly, Luke believed that the research was 'an academic confirmation of what I am doing is working in the classroom'. Andy discovered 'reading a journal article and then reflecting on my professional practice made me ask, "What can I do better?"'. Valerie also enjoyed 'that sort of higher academic way of looking at teaching'. Helen welcomed the opportunity to 're-engage with university-style literature and with academic writing':

> It is really good to go back and read this information because it reinforces what you are doing. It has been helpful because you are going along doing what you are doing and hoping that that is OK, that it is all working out. Things do go well when you get the time to actually really think and base your teaching on research, when you have a chance to look at the literature and see how things can change, when you decide to dedicate time and strategies, and implement stuff, and how then you can have an effect.

The teacher-researcher accounts of connecting with the literature reveal that, unlike many scholars and statements from teachers in the literature, discussed in Chapter 2, they did not perceive a gap between so-called theory and practice in terms of the former's application to the latter. For example, the teacher-researchers at Grange did not dismiss out of hand pedagogical recommendations from the literature as 'Ivory Tower Syndrome' knowledge (Gore and Gitlin 2004, p. 42), as evidenced in the adoption of pedagogical approaches such as self-directed learning and mastery learning through the use of technology. However, whilst open to suggestions from the literature, Daphne and Lillian, for example, were prepared to discontinue recommended collaborative practices when these practices proved disruptive to learning in their classrooms. The teacher-researchers did recognise a gap between practice and the literature but in terms of disparate discourses, not in terms of what they did in the classroom; but this was not found to be an unbridgeable gap. Rather, it was a matter of them becoming re-acquainted with educational discourses with which they had been familiar in their teacher preparation courses.

As a result of these connections, what do we learn about teachers' knowledge from the action research at Grange? The teacher-researchers' selection of an issue to research, the way their research was conducted and their research findings reveal the extent to which their knowledge is embedded in their classroom practice and within their school. The teacher-researchers reveal a knowledge base composed on personal knowledge of themselves and of their students, disciplinary knowledge of their subject, pedagogical knowledge of the ways to teach their subject, institutional knowledge of the way the school works and newly acquired research knowledge, all framed and communicated in the discourse of practice – many of these knowledges are reminiscent of Shulman's (1987) construct of a knowledge base for teaching. Whilst these knowledges are specific to context and embodied in the person of the teacher they are nonetheless transferable to other contexts, be these classrooms or schools, because it is the teacher who takes this knowledge with them and decides on its fit with the new context.

There are numerous reports in the literature on the impact of action research on teachers; for example, Richert (in Leat et al. 2015, pp. 274–5) found that as a result of action research teachers felt revitalised and expanded their sense of what teachers can achieve. They saw that what they did matters – similar responses as those reported by the Grange teacher-researchers. Johnston (1994, p. 39) reported that teachers involved in action research found it 'professionally

and personally rewarding' and that it contributed 'significant changes to their practice and their understanding of that practice'. Peters (2004, p. 551) noted that teachers 'felt they were more aware of their practice and of the thinking that informed their decisions'. These teacher responses from the literature resonate with those of the Grange action researchers and indicate the potential positive impact of the inclusion of research into teachers' work.

The reaction of colleagues

We know from the teacher-researcher accounts in Chapter 4 that many of their non-researching colleagues supported the research by sharing their library access codes with the teacher-researchers. As well as this practical assistance, Kathy found that a number of colleagues appeared interested and asked questions about her research. Barbara felt that there were members of her faculty who were 'on-board' with the initiative, particularly once they saw the benefits of technology in supporting social networking in students with learning difficulties. Valerie was 'really lucky to have very positive colleagues who were interested and generally very supportive'. She also noted that because the installation of smartboards at Grange was relatively recent, other teachers in her faculty had 'lots of questions about using them, what they can be used for, their limitations and different ways the students interacted with them'. Lillian's colleagues made helpful suggestions and when Amanda and Helen discussed their project in faculty meetings a number of their colleagues embraced the reading model used in their research:

> Helen and I have been approached countless times by people who said, 'Your project just sounds so good, that is fabulous. Well done!' I was so excited to hear that. And for us that was a bonus that we didn't expect, and it has been a really valuable by-product for our self-esteem. And we felt really supported amongst the faculty and amongst the school as a whole.
> (Amanda)

However, there was also a feeling expressed by a number of teacher-researchers that because teachers have their own way of doing things, many were therefore unlikely to be influenced by the action research findings of other teachers. It is easy to see this kind of response as 'teacher conservatism' but 'it is just as likely to be the expression of the teacher's tacit understanding of school tradition and culture' (Elbaz 1991, p. 14) and of the school climate which can stifle attempts to do things differently. Amanda recognised that, 'not everyone is on board' and Daphne found 'a few members of staff can be quite negative towards new initiatives in the school'. Helen reported receiving comments and being asked questions such as, 'Oh you're having another day off! Why aren't you ever in class?'. Luke recounted similar remarks such as, 'Oh you're off to the CV-building workshop. Here we go again, you get so much time off.' Charles suggested these comments were the result of colleagues observing that 'a lot

of money was being spent on staff development and some people feel it could have been utilised elsewhere'. Sophie faced questions from colleagues: 'Why are you getting so much time off? Why can't you just be at school? Why do you have to have time away from your classes?' These questions also arose from her colleagues' belief that action research was 'money wasting' and not the real work of teachers. However, she hoped 'once they see some of the good things people have done that will open their eyes a bit'. Comments like these were also reported from the long-running Australian Project for Enhancing Effective Learning (PEEL) when non-researching colleagues referred to the activities of the researchers as 'a round of verbal group masturbation … that is, people who get together to tell each other how wonderful they are' (Eilertsen et al. 2008, p. 305).

Funds well spent?

With the mixed reaction from their colleagues concerning the value of the action research projects and the considerable funds allocated to them, the teacher-researchers were asked if they considered these funds had been well spent.

Lillian said 'it has been fantastic that so much money has been available for us to do research' and Nancy replied to the question in one word: 'Definitely.' Valerie's retort to the suggestion from some teachers that the funds might have been better spent on resources was:

> Materials do matter and in our classroom we don't have a lot of very expensive art materials but it is the concepts behind teaching that are the most important and you get that by having good teachers and action research is one way of making good teachers.

Charles entered into the resources versus research debate, commenting:

> I think this action research project is great generally because it gives an opportunity for staff to brush up on their academic training. The more professional learning your staff can do, the better their job performance and it just trickles on down. A smartboard doesn't make a good teacher.

Barbara felt the funds were well spent because they have been 'able to rewrite our programs and actually look at experimental design'. Amanda was very positive about the funding allocation to action research.

> Absolutely, yes, yes. I am so sorry that other people haven't had the opportunity because it has really given me a new lease on life; you don't get this opportunity very often so when you do you have got to take it with both hands, because you know we have been through some lean years and so to have the money spent on us and our professionalism has been fabulous. It has made me feel that you can make such a difference to kids, you just

> have to want to, you have just got to be engaged, you have got to care, you have got to be giving of yourself, telling them that they have the ability.

However, whilst the teacher-researchers were supportive of the allocation of funds to action research, some added caveats, such as Luke's: 'Grange needs a lot of things and I don't know if maybe it has been utilised the best way it could have been.' Sophie explained that perhaps because she was disappointed with her action research process and findings (although her research partner was not), that maybe the funds were not so well spent, but added, 'I am hearing from other people they have gained a lot out of it.'

Understanding of action research

In Chapter 3 we learned that only one of the teacher-researchers had any previous experience of action research or even a clear concept of what it entailed, so at the conclusion of their experience they were asked what they now understood to be the characteristics of action research. For the majority, the outstanding characteristic of action research was its capacity to support change and improvement in pedagogical practice. This is clear in Andy's advice to other teachers:

> If you are interested in your own teaching practice and there is something that you would like to change, do some research, try something new, collect data before and after and see if you have made a change and if things have improved.

Kathy saw action research 'as a way of helping people and groups to change. It is an in-depth, intense study to make learning and social situations better for students and teachers.' Sophie emphasised that it was 'finding something that you know needs improvement and working out the best way to try and fix it'. Lillian highlighted the immediacy of the change aspect, saying, 'It's researching into something that you can make improvements to right now.' Amanda offered potential researchers the following advice on selecting an issue for research:

> The research topic needs to be something that is measured over a long period of time and that actively involves the kids in whatever you want to test. You need a very rigorous, methodical approach; it needs to be something that is reinforced and gives students a chance to grow and develop. It needs to be something that is accessible. You need to have something that is measurable; you need to have a yardstick to hold your research up to. You need to think before you begin about how and what you are going to measure.

The collecting of good evidence to ensure research validity was central to Amanda's concept of action research. Valerie and Barbara also spoke of evidence

gathering and linking individual classroom research to the broader educational field by 'looking at all of the current research in the field and seeing how it can be used in your classroom, then assessing if it is actually working and then putting what you found back into that field of knowledge'. Kathy had a similar approach, saying,

> You need to find other people's research and see if you can use it in some way to back up what you are doing or maybe to give you an idea of how to do your own research, putting it into practice to see whether it works.

For Will it was an opportunity 'to broaden your horizon and take in other people's ideas. It's learning through doing, and then reflecting and then doing again, and then learning and reflecting and doing again; it is a never-ending cycle of lifelong learning.'

For all of the teacher-researchers the key to action research was, as Barbara said, 'reflecting on your own teaching practices'.

> I think it is reflection; it is always important to think about what we are doing as teachers and if we are doing it right. And sometimes when you have been a teacher for a while you just go stale and you think, 'It is all going to be all right and I have done this a thousand times.' But you know our world is changing and we have got to think about our learners, 21st-century learners who learn totally differently from how we learnt at school. (Daphne)

For Helen, action research combined a number of the features already highlighted but with an emphasis on the situated nature of action research within the teacher's own practice; it is

> about what I am doing to improve my teaching and doing that by reading research and taking it on board, combining it with my understanding of my own class, then making changes to suit students and myself to improve their outcomes and the way I teach.

Taken together, the comments indicate that the action research at Grange falls within the practical research category identified by Carr and Kemmis (1986), which aims to improve practice.

Is research teachers' work?

In the interviews following their research experiences the teacher-researchers were asked two questions to ascertain their construct of teachers' work and the role of research in that work: Would you carry out action research again? Would you undertake a research degree? There were teacher-researchers who had no hesitation in saying they would be willing to engage in other research, others

who were interested but had various reasons for not doing so in the near future and one who had no interest in pursuing further research.

Would you carry out action research again?

Valerie answered the question with an unequivocal, 'Yes, because I now feel back into the swing of academic work' and she felt that incorporating research into her work as a teacher would enable her to integrate two sides of her professional self. Will, the only teacher who had previous action research experience and currently enrolled in a master's degree, was not only keen to continue with action research but would also 'encourage other teachers to be involved'.

The majority of teachers, whilst expressing an interest in further action research, gave equivocal responses: 'Yes but … further down the track' when they did not have 'so much on my plate'. What teachers lacked was time, which was mentioned by all teachers because they said teaching is 'getting busier every year'; it had become 'just juggle, juggle, juggle'. Amanda sketched a day in the life of a teacher which illustrated why action research without some release from teaching was simply not an option for most teachers:

> I would do more action research but I don't know if we would get the time to do it well. Teachers are often accosted for their time. On a daily basis you don't know what is going to come up; it could be a kid has a welfare issue, you could have a parent that needs to see you, things go wrong, things happen that aren't scheduled. I would like to do more research. Whether or not I would do it without the support that we have had this year, at this point in time probably not. I have four kids and we have had to do a lot of it at home regardless of days off. So I think that it might be difficult to do it to this level, but I wouldn't say no.

Lillian was doubtful if it was possible to complete an action research project without the funding for at least some release from class. Kathy expressed the feelings of most of the action researchers when she said 'the time factor was a big deal. I couldn't have done the action research without those few days off', and none of the teachers anticipated that release from face-to-face teaching to engage in research would become standard in schools. (When the teacher-researchers speak of release from class they are referring to an average of five days taken by each research team over the course of the year of the action research project.) Andy said, 'If I was cruising along and I was very settled in my job then sure I would do more action research.' Similarly, Nancy commented that her current responsibilities made further research something for the future. Lillian 'enjoyed the discipline of reading which I would not have done otherwise; I would have to think carefully about any further research'. Another teacher-researcher, newly appointed to an executive position, said it would have to wait until 'I get my faculty into shape'.

Sophie was the only teacher who replied with a resounding 'No! I just like being in the classroom. I am not so much a person who wants to sit down and read and study literature. I did get a lot out of it but it is not my personal forte, it's not where I like being.'

Would you undertake a research degree?

In answer to this question Luke responded, 'At some stage because I like learning and since I completed my DipEd I've always had a yearning to go back and do a master's or another postgraduate course.' Valerie said her aim was one day to do a 'PhD or something like that' and the action research had reinforced her desire to do this. Throughout the action research process Daphne said she saw herself as 'an academic kind of person' and was attracted to the idea of further formal research. It had crossed Charles' mind 'but I have never really taken it any further and am not likely to do so in the near future'. Nancy considered doing a master's but added 'it is a tough call because of my inability to say no to extra things in the school'. Amanda said she had 'put off doing a master's for a long time but I think after doing the action research it wouldn't be so difficult; it can't be any more than what we have already done. So, yes I definitely will look at that.'

Kathy found her experience of action research 'very, very interesting but it was hard working full-time teaching and having a family. I can't imagine going back to university at this stage. I probably would down the track.' Barbara, while valuing the research experience, responded: 'Oh gosh, not at this stage of my life, maybe later down the track. I did enjoy all the reading, I did enjoy hearing what other people are doing but I don't know if I have time to fit research in, not in the near future, but perhaps one day.' Lillian thought it was currently 'unlikely but it's always on the cards'. Andy said, 'No, not really … I feel like a pretty new teacher. I'm still settling in, and still pretty green and I've got plenty of work to do just getting my day-to-day teaching up to scratch.' Lillian said, 'I'm not interested in studying at university again any time soon. I just want to keep improving my teaching skills.' Helen 'would never say no, but I don't think I'm at the right point in my life at the moment, but it is definitely an interest'.

Summing up

> I didn't imagine I would ever be a researcher.
>
> (Barbara)

Reading and re-reading the teacher-researcher narratives in this book has reinforced my belief that any discussion of teachers' work and the inclusion of research in that work fundamentally rests on inseparable epistemological and ontological issues. The critical epistemic issue is for teachers' knowledge to be treated with the same parity of esteem as researchers' knowledge, and for this

to happen requires a rethinking of the institutional situatedness of professional identity. This ontological issue is about how educational professionals in different institutional contexts define, or have defined for them, a way of being in the world; for some it is a way of being a teacher, for others a way of being a researcher – it is about professional identity. With this in mind it seems to me that teachers must be enabled to re-invent or re-imagine themselves, if they so wish, to pursue research relevant to their practice, to their schools and to their communities, and that the knowledge so generated be regarded by other educational professionals as high-status knowledge. In other words, if teachers' work is to include research, then the construct of teachers' situated identity must be open to renegotiation. Teachers will need to be empowered to envisage future 'possible selves', that is, to imagine the kind of teacher they might become (Markus and Nurius 1986, p. 954). If we accept the argument, as I do, that identity is socially constructed, it means that it is dynamic and may change over time (de Ruyter and Conroy 2002, p. 511); therefore constructs of teachers' work may shift with changing institutional circumstances, as we saw at Grange. The teacher-researchers at Grange, for the duration of the action research project, experienced what Cooley calls the 'looking-glass self' in which the concept of self is constructed from the ideas held by others about the individual (in Prus 1996, p. 50). In this instance it was the principal's construct of the teachers as researchers that was reflected back to teachers.

The social construction of institutions and roles within these institutions, explored in Chapter 1, offers insights into the way professional identities are formed and maintained and also how they may be changed. Berger (1966, p. 107) argues that within the social situation of all institutions there is a limited repertoire of identities, or types, available to the participants in that situation. This is evident, for example, in schools where the traditional construct of teachers as classroom purveyors of other people's knowledge prevails. Because identification is specific to situations, to be a given an identity is to be objectively located in the world, that is, to be given a specific place in the world (Berger and Luckmann 1966/1991, p. 152). Within institutions, professional identity is forged through situated interaction and is not stable, and this therefore offers the possibility of change and of constructing teaching differently, as occurred briefly at Grange High.

Teachers at Grange were able to experiment with what Ibarra (1999, p. 765) calls 'provisional selves' as a way 'to bridge the gap between current capacities and self-conceptualisations and the representations they hold of what attitudes and behaviours are expected in the new role'. As the teachers experimented with the new role of teacher-researcher they were able to produce 'new repertoires of possibilities' (Ibarra 1999, p. 765) because action research gave them the opportunity 'to take a stance on who they are or who they desire to be' (Gibbs 2014, p. 430). They did this because, according to Baumeister and Muraven (1996, p. 405), individuals choose, alter and modify their identities based on what works best in any given situation. In the words of Stenhouse (in Leat et al. 2015, p. 283) these teachers were given the opportunity to develop 'multi-dimensional selves'.

It was the key role of the principal at Grange High who 'thought outside the box' in terms of teachers' work and policy enactment and by so doing created, if only fleetingly, a social climate for thinking differently about institutionalised roles. In the case of Grange High, the social climate of the school that enabled teachers to engage in action research was an aberration, the coalescence at a particular time and place of people and policy conducive to a different way of constructing teachers' work. However, once the people and policy moved on there was a return to what Willegems et al. (2017, p. 232) call the 'core business' of classroom face-to-face teaching of syllabus content.

This book has given the teacher-researchers from Grange High the opportunity to enter the scholarly conversations about their work through the dissemination of their research. This research is what Nolan and Putten (2007, p. 402) refer to as 'truly indigenous, insider projects'. In the Grange teachers' research, students were not reduced to quantifiable units, as in large-scale research conducted by outsiders, and teachers were not reduced to classroom 'interchangeable widgets' (Schleicher in Bagshaw 2016). Evidence from Grange suggests that over 20 years ago Hargreaves (1996, p. 3) was correct in suggesting that the inclusion of research in teachers' work would make that work 'more effective and more satisfying'. More recently Andreas Schleicher (in Singhai 2017, p. 3) suggests that 'Australia needs to make teaching intellectually more attractive'. The way forward is suggested in a comparison he makes between Australian teachers with those in Singapore where 'teachers are not just delivering education but also designing the education system and researching innovative practices, it is a different role they play'.

The aggregation of case studies such as those from Grange, the kind of local case studies envisaged by Lewin and Stenhouse, may better serve the needs of teachers and students than do the current preferred large-scale, randomised research projects searching for what works best everywhere – the illusive 'silver bullet'.

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