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Embracing Innovation

The Agile Teacher's DNA

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Master of Education – Research

CERTIFICATE OF ORIGINAL AUTHORSHIP

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as part of the collaborative doctoral degree and/or fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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In his book The World Is Flat (2005), Thomas Friedman refers to the emergence of a world in the twenty-first century that will be vastly different from the one in which we (current education practitioners) were ourselves, educated. We are made aware of the need to provide learning experiences that prepare students for a globally competitive future, where problem solving, divergent thinking and the ability to be flexible in learning approaches are key components of "success" (Jacobs, 2010). It is considered that students will learn best in an environment where "best" practices are integrated into the classroom and where teachers develop a high sense of adaptability (Cook, Bell, Nugent, & Smith, 2016).

Abstract

In the 21st century, the focus in education should be on the provision of learning experiences that prepare students for a globally connected future, where problem solving, divergent thinking and the ability to be flexible in learning approaches are key indicators of success. Students are thought to learn best in an environment where innovative practices and opportunities for critical thinking are integrated into the classroom; and where teachers develop a high sense of adaptability, engaging students in creative and innovative learning activities (Buchanan, Harlan, Bruce, & Edwards, 2016). How teachers adapt to change and embrace emerging technologies and pedagogical innovation have been topics for debate for some time (Zimmermann, 2006; Sappey & Relf, 2010), with much emphasis on the impact of external influences, access to resources and demographics and less on the characteristics of the individual and their adaptability.

This research study investigated the characteristics of educators who appear to embrace innovation and change, tolerate ambiguity and have a broad sense of perspective. It considered those who seemingly thrive amongst the chaos of learning, giving students what they need, when they need it - the "*seize the day*" or "*agile*" teacher. The focus was primarily from a socio-cultural perspective, exploring practices, social, cultural and environmental factors affecting agile teachers.

The study considered the following questions:

- What are the characteristics of "agile" teachers?
- Who are the "agile" teachers?
- Why do "agile" teachers teach the way they do?

- Are “agile” teachers “great” teachers – and “great” teachers “agile”?
- Do technologies impact on how “agile” teachers teach?

The research design was qualitative, using a grounded theory approach to identify and describe the characteristics of teachers, who demonstrate this adaptability. The study explored the factors that influence the emergence of “agile” characteristics and practices, the methodologies and strategies that influence adaptability, and the relationship between the development of agile characteristics and the use of emerging technologies. The foundation for the study was the interplay between technology, pedagogy and innovation, focusing on the premise and understanding that innovation is the renewal or creation of processes that are effective and add value to existing practices.

The study investigated the diversity in the characteristics exhibited by “agile” teachers. And sought to elicit the narrative of the agile practitioner, using visual metaphor as a stimulus for discussion utilising asynchronous online interviews and teacher reflections. Participants reflected on personal practices, pedagogical implications and the influence of technologies, reflecting the connections between experiences, practice and agile adaptations.

The findings of the study reveal the complexities of identifying the characteristics of the agile practitioner and the implications for practice and educational professional learning. In particular, they reveal the personalised understandings and reflections of agile practice, beliefs of others about the “agile” teacher and the association of social perceptions towards “great” teachers. This study has identified a new descriptor for the exemplary teacher, the term “agile”, and has given insight into how and what the agile teacher or practitioner *thinks,* as well as what they *do* and *say.* The agile teacher generates an autopoietic practice where re-engineering and reconceptualising self occurs, enabling adaptation to changing pedagogical contexts, emerging digital technologies and the individual learning narrative of students.

Chapter 1 - Introduction

1.0 Introduction

This study was based on the premise that whilst the general population inside and outside of education readily recognises a teacher as "good or "great" (or *not* good/great), there are numerous, widely interpreted definitions for these characterisations. Whilst educators speak about "best" practice and excellence in teaching, these are concepts that are not easily defined. Great or effective teachers are broadly recognised as being prepared, organised, flexible, positive, going beyond the subject, demonstrating love, care and encouragement, having high expectations, appreciating differences, diversifying instruction and continuing to learn themselves (Gose, 2012). In one study, some great teachers are referred to as *enchanting*, described as having a unique self, demonstrating warmth, humour and a willingness, and as being inspiring, creative, patient and risk taking *(*Sammons, Lindorff, Ortega & Kington, 2016*).* In education, the expression *best practice* is also used to describe teachers who are considered great or effective. In business terms, "best practice" is a clear and concrete behaviour that solves a problem or achieves a goal. It is accepted as a model of practice and of implemented strategies that will always produce the desired outcome, focusing on defined elements that can be used as benchmarks for effectiveness (Bardach, 2011). However, in education, which is inherently focused on innumerable variables, best practice as a definition is used for a range of strategies and approaches "*that may or may not have been rigorously evaluated*" (Arendale, 2016). The term, "best practice" in education although somewhat fluid, ambiguous and contested in definition, describes approaches of effective (or great) practices. Best practices may be what some teachers *do*, but identifying the characteristics that determine *why* they do what they do (ie., understanding the underpinning characteristics of these practitioners), is the focus of this research. In this study, I introduce the term "agile practitioner" to describe the teachers of interest and then focus on understanding these teachers' characteristics. This research concentrates on factors beyond specific practices and actions, considering the *why* rather than the *what;* exploring reasons, facilitators, barriers and implications for practice rather than the practice itself.

The study first sought to gain teachers' perceptions of the characteristics of agile practitioners and then sought to solicit views and reflections from self-identified agile teacher practitioners regarding the facilitators and inhibitors that may influence the emergence, development and perpetuation of adaptive, responsive ("agile") characteristics that affect the strategies and practices of some educators. Teachers and pre-service teachers, across the K-12 spectrum globally, participated in this study.

1.1 Background

"Agile", as a definition of teacher characteristics or practices, has not been utilised previously in general education. The use of the term agile in this study evolved during a meeting with a corporate business group, discussing agile project management - a contemporary business practice that focuses on an iterative and incremental method of managing the design and development of activities for new technology products or implementations, and relies on high levels of flexibility and interactive collaboration (Bonner, 2010). Essentially, agile practice as described in the business context, depends on a commitment from facilitators or leaders to guide the evolution of behaviours that emerge from the interaction of independent agents, allowing practices to emerge as a response to influencing factors, instead of specifying in advance what the effective behaviour or practice will be (Meyer & Marion, 2010). Agile practices encourage developers to embrace change as an opportunity to help the "customer" respond to developmental instability (Bonner, 2010). In the same manner, agile practice by teachers may demonstrate characteristics that embody change as an opportunity to help the "customer" i.e., the student, respond to the turbulence in learning created by changing perspectives, global transferences of connectivity and the impact of emerging technologies on new expectations for learning.

Agile project management focuses on an awareness of impending obstacles, responding to small issues as they appear, and improving the project or journey by looking ahead, managing planning and practice as a response to previous experiences, engaging insight and regrouping frequently. In agile project management, individuals are expected to reflect daily on questions such as "What is in the way of you doing your work?" (Meyer & Marion, 2010), and enquiries focusing on what was done previously, what might be done "now" and processes going forward. Focusing on what was done, what is going to be done and perceived or actual impediments to the work being done, the agile practitioner is able to reflect, respond and adapt as required. The qualities of agility include dexterity and readiness for action, employing iterative stages of discovery, planning, developing, implementing and reflecting (Abrahamsson et al., 2002). In education, this concept of dexterity and readiness, whilst not referred to as *agile,* is supported and expanded by the description of the *Intellectual Character* (Ritchhart, 2001), embracing the idea of a practitioner demonstrating curiosity, open-mindedness and motivated intellectual behaviour. The term *intellectual character* implies observable behaviours and characteristics such as strategic thinking, reflective and deliberate practice, considering depth and permanence rather than sporadic, fleeting practices or behaviours (Ritchhart, 2001).

The 2014 Horizon Report for Higher Education (NMC, 2014) made a connection from education to agile, referring to how educational leadership could benefit from understanding agile startup models in business in order to improve efficacy. The report claims that through focusing on

leadership modeling and developing teams of practice, and on the implementation of experimental programs for developing teaching and improving organisational structure, change in schools is sustainable. The business approach described utilises technology as a catalyst for encouraging and implementing a culture of change and innovation. The current study aimed to identify characteristics of the *agile practitioner*.

The concept of "next practice" has also underpinned the study, as it focuses on the assumption that the practitioner embraces a new approach to *stimulating, nurturing,* and *accelerating* innovation, which is strongly motivated by the needs of the user. In one sense 'next' practice can never be achieved – it is always something just beyond current practice. The term is meant however, to express the concept of genuinely new approaches founded on practical understandings and exploring purposeful, disciplined practices that optimise the possibilities for professional creativity (Green & Hannon, 2007).

The research has, therefore, built on existing frameworks of quality practice, centering on the identification of characteristics of educators in the context of "*next*" or "*agile*" practice, and the relationship the development of these characteristics may have to the use of emerging technologies. The preference is to use the term *agile* as a result of learning from literature, business and personal experiences, embodying in this term reflective, responsive professional strategies and behaviours, personalised to the needs of the learner (both teacher and student) and focusing on innovation for improved practice.

This study develops an understanding of agile practice in education from a grounded perspective and then uses the understandings derived to look at agile teachers, ie., teachers who appear to have agile characteristics or exhibit agile characteristics. The study has not focused on the understanding of attitudes towards change, nor reasons why teachers may reject change in practice. It has instead focused on exploring adaptability, uncovering the factors and personal characteristics that drive teachers who embrace innovation and new technologies, developing an understanding of how these practices might be used by other educators to embed an agile approach to teaching on a broader scale. The research is not based on the development of a model for change, but is rather a reflection of thoughts and practices that embrace response and adaptation to change. Innovation in teaching practice will be considered, particularly as a response to emerging technologies, the technologies themselves not being regarded as innovative, but rather their application and use by teachers (Martinez & McGrath, 2014).

Malcolm Gladwell discusses in his book, "The Tipping Point" (2002) how ideas, trends and social behaviours spread through a population, identifying the factors that enable a movement of change to cross a threshold or achieve a critical mass - factors such as the importance of the function of connectors (those who network, enabling change and innovation), information and knowledge specialists and the relevance of the "s*tickiness factor" - i.e*. the processes or factors that have to occur in order to make an innovation, idea or strategy "stick"*,* in changing a paradigm of thinking

or practice (Heath & Heath, 2007). Consideration was given to what Berger (2008) refers to as "circular causation" - linking the relationship between perception and behaviour (Zhao & Cziko, 2001). Identifying the factors that promote change has been a critical aspect of my research, as the absence of such identification has been established as an existing gap in current research. This study has focused not on the need for change (i.e., "reform") but rather on the factors that promote change, that is, factors that encourage the development of a personal pedagogy demonstrating reflective, inclusive, creative, diverse, adaptable and innovative practice.

The stickiness factor relates closely to the importance or relevance of the message that is to be passed on, the factor that makes it memorable and how this incites change or encourages someone to initiate action (Heath & Heath, 2007). Understanding how teachers think, how they learn, what motivates them to become different learners and to embrace innovative practices are all underlying elements in identifying the s*tickiness factor i.e., the characteristics that identify the agile teacher.* Associating influences, distractors, the acquisition of new thinking and drivers of adaptability, will be a significant contribution of the study. Identifying reasons for teachers to find purpose in their investment (of time, money, energy, effort) of changing practice (adapting) and implementing innovative strategies may initiate a smoother transition through change (Zhu, Wang, Cai, Engels, 2013).

The focus of the study has been to understand why some teachers ("agile" teachers) embrace change and adapt to new or challenging situations, and to investigate the factors that make change and innovation "stick" (Heath & Heath, 2007). The study uses the metaphor of DNA, to describe the fundamental and central characteristics or qualities that a person possesses and values (see for example, Oxford Dictionaries, 2017). It has sought to identify the *DNA* of the agile teacher – what makes them who they are, as individuals and as an identifiable group. The study has explored these factors in the light of how they influence change in attitude and practice methodologies and strategies, the embodiment of new ideas, adaptable practices and the integration of available technologies to diversify and enhance learning. Focus in the study has also been on adaptability and innovation enabled by (but not necessarily driven by) technological change - reimagining what learning might be (Zhu et al., 2013). Innovation in technology has been abundant in the past few decades and the promise that technology will revolutionise learning has been repeatedly espoused, but needs to be critiqued and studied. Learning for adults and children is considered to be in a state of transformation (Cochrane & Narayan, 2013; Bedi & Germein, 2016) with the need for teachers and learners to adapt to technological developments and integration of strategies to address the changes required as a focus for schools, colleges and universities globally (Heppell, 2008; Bedi & Germein, 2016). Relationships between technological literacy and the practices of learning were also explored. The focus of this study has been heavily on pedagogy, referring to the activities of learning and teaching, the way thinking is described, learning activities planned, and how teachers apply theoretical understanding in practice (Beetham & Sharpe, 2013).

1.2 Problem Area

The study sought to identify recognisable factors of *agile* practice both from teachers' perceptions and from other research studies linking professional learning with effective, responsive and adaptable teaching practice (Cole, 2012). The findings by researchers who have previously explored the differences between early adopters (of technologies) and mainstream faculty practitioners (Jacobsen, 1998) were utilised to draw deeper conclusions about teacher practice. Adoption models or theories as described by Everett Rogers (2004) in his paper, a Prospective and Retrospective Look at the Diffusion Model, describe factors affecting innovation with technology for teaching and learning. The incentives and barriers to integrating technology and the resulting changes to the teaching and learning environment (Jacobsen, 1998; Keppell et al., 2015) were utilised to formulate questions, and to present a ground level entry point for the study. The Diffusion of Innovations theory (Rogers, 2004) helps to explain how ideas spread through a culture and also articulates the factors that identify those who (1) adopt innovations quickly (Innovators), (2) are early adopters who follow quickly on Innovators' heels, (3) are individuals who take some time to adopt new ideas and innovations and (4) are those who are slow to adopt new ideas or perhaps never identifiably change their practice. Rogers (2004) describes characteristics or elements of innovation that affect "uptake" such as the improvement of generational innovations, compatibility to an individual's life or practice, how easily an innovation can be tested and the observability or visibility of the innovation.

This study focused on identifying and describing practices that enable teachers to embrace innovation, be informed risk takers and to develop an agile practice through which they can manage change. It was not about "fixing" something that is broken or not working – it was not about identifying or "improving" underachieving teachers or students. It is important to note that the study was not a reaction to an absence of change in classrooms - indeed, research and case studies globally reflect considerable change in education - nor was it an attempt to understand how to make teachers "better". It is also noteworthy to establish that whilst at times it may be difficult to find evidence of observable change, that the researcher intended to establish if an absence of evidence was simply because that there was no (pre) gathered information regarding such evidence (Altman & Bland, 1995).

1.3 Aim of the study and Research Questions

The aim of the study was to investigate, identify, define and synthesise the characteristics of agile teachers, exploring how these practitioners think, why they make the decisions they do and to understand the relationship between these practices and the use of emerging technologies.
The initial research sought to address the following overarching questions:

a. *What are the identifying factors (ie., characteristics) of agile teachers?*
b. *How do agile teachers respond to the use of emerging technologies?*

Sub Questions

- Who are "agile" teachers?
- Why do "agile" teachers teach the way they do?
- What are the facilitators and barriers (drivers and inhibitors) that impact on agile teachers?
- Are "agile" teachers "great" teachers – and "great" teachers "agile"?
- Do technologies impact on how "agile" teachers teach?

1.4 Significance of the study

The significance and innovation offered by the study lies in the fact that comparative studies previously conducted have:

c. Focused primarily on the need ***for change***, rather than on understanding the development of agile, adaptable practice ***reflecting change***
d. Relied more heavily on establishing and understanding the differences between those who adopt technologies for learning and those who don't; rather than exploring the impact on practice by those who adopt technologies for learning.

The relationship between the evolution of teaching practice and the integration of emerging technologies is recognised with many teachers now feeling somewhat prepared in using technologies in learning (Ertmer, 2005). The relationship between technologies and an agile approach to teaching practice has not been previously established and this was explored during this study. The study was based on the premise that a range of technologies were available to the practitioner and that these were not, in themselves prescriptive or definitive.

The analytical focus of this study was to identify reflective, adaptive, flexible and responsive strategies and practices in educators and the factors that drive or inhibit such practices including the role of emerging technologies in contributing to the development of an agile teaching practice; and to interrogate the relationships between 'quality' teachers and agile practices.

1.5 Definitions and concepts used in the study

The notion of "*agile*" is used throughout the paper to describe the characteristics that are being investigated by the study, using a grounded theory approach to develop definitions and identification of the concept of agility.

Teacher and *educator* are used synonymously, indicating any practitioner involved in the education of young people from pre kindergarten to the end of secondary schooling.

Participant refers to the educators who have elected at any stage of the study to respond, reflect or provide an opinion that has shaped the course and findings of the study.

Social media refers to use of a range of social interactions among people in which they share, create or exchange information and ideas in virtual networks and communities (Pavelea, 2013) Social media includes, but is not restricted to Twitter, Facebook, LinkedIn and online professional forums

1.6 Structure of the dissertation

This dissertation is divided into five chapters. In chapter one, the background of the study has been discussed, including an overview of education in contemporary times and an introduction to the relevance of the term “agile”. The problem area, aims and objectives of the study, the research questions and significance of this study were also discussed. In Chapter Two, relevant literature and gaps being addressed from previous and existing studies are discussed; Chapter Three focuses on the presentation and discussion of the methodologies and methods used to generate data for the study. In addition to methods, the population, data collection processes and other relevant factors are considered. Ethical considerations and data analysis processes are explained, as well as limitations of the study. Issues of validity and reliability are also discussed in this chapter. In Chapter Four, evolving concepts and the emergence of theories from the study are examined through analysis of the data. Chapter Five discusses the findings and pulls the emerging theories together, considering implications, limitations and recommendations for further research.

Chapter 2 – Literature Review

2.1 Defining Practice

The practices of teachers have seemingly “always” been observed, critiqued and examined, with much discourse focusing on the quality of practice and the classification of good or great teaching. Best or excellent practice in education may be a challenging concept to determine, as researchers acknowledge that a widely accepted and readily observable definition of excellent or exemplary teaching has yet to achieve consensus (Korthagen, 2004; Gose, 2012). The concept of best or excellent practice has been a focus of much discussion in education in recent decades (Gose, 2012; Ayers, 2006; Budd & Miller, 1999; Shor, 1986), with a focus on “successful” teaching resulting in teaching guides and papers that articulate what best practice “is” (Crews & Wilkinson, 2015).

The term *best practice* was originally taken from professions such as medicine and law where measurable practices and applications of procedures directly affect outcomes. It is used in business to describe standardised strategies that embody success - tried and true behaviours (Zhao & Cziko, 2001). In some sectors of education, without being defined in specific processes, the term ‘best practice’ has been used to describe thoughtful, informed contemporary teaching (Scourdoumbis, 2014). Best practice as a definition of standards, is a dichotomy in that it is defined by specific processes whilst having to demonstrate active, experimental, rigorous and challenging practices (Emeling, Heibert & Gallimore, 2015).

When considering “best” practice across a range of studies, a variety of adjectives have been used to describe such practice: for example, ‘good’ (Avidov-Ungar & Eshet-Alkakay, 2011), ‘effective’ (Wang et al, 2010), ‘highly accomplished‘ (National Board for Professional Teaching Standards (NBPTS), 1987), ‘excellent’ (Robbs & Broyles, 2012), and ‘qualified’ (Darling-Hammond & Youngs, 2002). Despite the variation in terminology, each study and discussion describes a similar set of values and attributes, describing quality teaching practices (Biggs & Tang, 2011). Hattie (2015) discusses the continuum of effectiveness of teachers, from highly effective to low impact and considers how these affect student learning. In his framework of *Visible Learning,* Hattie outlines a range of strategies that impact on best practices and quality teaching instruction. In 2007, a study was conducted in Sydney (Zammit et al., 2007) defining quality in Australian schools and considering the relationship between quality teaching and student outcomes. Quality teaching, a term more recently accepted in education, focuses on the recognition of quality pedagogical practices (Wang, Lin, Spalding, Klecka, & Odell, 2011), skills and understanding of the learning process. Quality teaching uses as a framework observable

practices identifying general characteristics of pedagogy that impact on student learning behaviours and responses.

The Australian Government Quality Teaching program, the New South Wales (NSW) Quality Teacher Framework (Ewing, et al., 2004), The AITSL Professional Standards for Teachers (Timperley, 2011) and other frameworks developed and used internationally, provide scaffolds for teachers to recognise practices that are deemed effective and to implement these into their own practice. These frameworks are largely aimed at providing teachers with the skills they need to become efficient teachers, to focus on professional learning and to improve the use of learning technologies in the classroom (Ingvarson, 2010). The frameworks establish criteria for observable standards of teacher practice and for tools for reflection and professional learning. The Quality Teaching Framework was used by the NSW Quality Teaching Action Learning Project (Ewing et al., 2009) and the Learning to Walk Project (Wilson & Powell, 2013), to research and develop strategies and behaviours, to enhance practices in teaching and to further identify quality teaching. These and other studies endeavoured to identify the "multidimensionality" of teaching (Spooran, Brockx & Mortelmans, 2013), noting that students were more focused on the clarity, stimulation of interests in the course content, preparation and organisation of the teacher and the ability to motivate than on class level, progress and test scores (Slavit, Holmlund & Lesseig, 2016).

Hattie (2012; 2009), indicates that the teacher has an impact on student outcomes in ways that are difficult to measure and that the teacher is (after the student) the most powerful influence in learning. Hattie's analysis explores the way teachers organise and use content, the way they create a classroom environment that is optimal for learning, the way they establish high expectations for success, and the way they encourage and support feedback as factors affecting deeper levels of engagement and achievement. It is with this argument in mind that the current study is focusing on behaviours by teachers and on exploring those characteristics of teachers who develop and change practice to meet the needs of students in classrooms. The focus is on new ways of generating information and learning, using technologies and strategies that reflect the current and potential contexts of global and local change in student needs.

The emphasis for the study will be on educators embracing the transition from accepted practices that achieve good student learning outcomes towards "next" and agile practices that embody innovation, identifying the new opportunities that may present for learners, and building capabilities to capitalise on them (Spencer & Balacco, 2009). Change practice can be considered by focusing on doing what we do currently, but doing it 'better', that is, if we need to change, it is because we need to improve practices. This operates on the belief that teacher practices require reform, that technology will deliver better content, make learning better and most of all 'engage' students (Richardson, 2013). In contrast, deliberate practice (Hattie 2012), which aligns with the concept of agile practice focuses on the relationship of teaching to outcomes and engagement, and on intentional practice where teachers understand the differences of each child and respond

to these needs (Epstein, 2007). Quality teaching, a term more recently accepted in education, focuses on the recognition of quality pedagogical practices (Wang et al., 2011), skills and understanding of the learning process.

The characteristics of great teachers have previously been explored (Richards, 2004; Gose, 2012), with some parallels to the notion of the agile teacher clearly demonstrated. Gose indicates that the identification of great practitioners and their instinctive, intuitive practices and behaviours is, in part, attributed to their often unorthodox methods and strategies in the classroom. His research considers the attributes of teachers both living and deceased who have been recognised as "great" by either the author, or the community at large. Further consideration is given to the way in which best or great practices are determined, observed and impact on students; identifying factors that work successfully for these teachers and the challenges, inhibitors and legacy left by these teachers (Gose, 2012). The primary difference between Gose's research and the one undertaken in this study is in the focus of identification of the *agile* (or great teacher), the exploration of personal perceptions and attributes, influencing factors, drivers, and characteristics. This study, whilst utilising observed characteristics from others, has inquired more specifically into the agile teacher's mind, learning *about* them *from* them. In Gose's study, the explorations were *about* the great teachers, but not directly involving them, with many of the teachers studied, no longer alive. Other studies, such as those by Ehrenberg and Brewer on school and teacher characteristics (1994), Goldhaber and Anthony on the efficacy of assessing teacher quality (2007) and Romanelli on great teachers as storytellers (2016) have explored the identification and definition of great teaching and great teachers. The notion of the outstanding teacher making a difference has been explored by Hattie (2003) whilst Foote, Vermette, Wisniewski, Agnello and Pagano (2000) completed an interesting study on the characteristics of the 'bad teacher', which also raised suggestions for teachers about how not to be bad or awful *(*Hosgorur, 2015*).* This last study was completed because it was felt that there was sufficient research on how to be a good teacher but little investigation into the qualities and undesirable images of those teachers considered to be 'bad'. The personal characteristics of the 'bad' teacher were investigated and identified, although not directly with the teachers categorised as such, but rather from the observations and feedback of other teachers and students. Like Gose's study on the characteristics of great teachers, these other studies have considered observable behaviours and personal characteristics but have not explored the way in which the identified practitioners think, which is what this study has sought to achieve.

Studies on best practice and the need for change also embody the notion that teachers are either "best/excellent", good teachers or great teachers - or they are not (Easton, 2008). Underlying most teacher education studies is the notion that the quality of teaching is significant in influencing student learning (Wang, Odell, Klecka, Spalding, & Lin, 2010). Researchers have attempted to study and improve the practice of teachers, focusing on inquiry learning, collaborative activities, connecting school to real world concepts and the integration of pedagogies that elicit sustainable deep understanding of ideas (Lampert, 2012). Additional studies (Burin, 2010; Keppell et al.,

2015; Lubawy, 2003) have identified what teachers need to understand about teaching and about pedagogical practices that support student understanding. However, it appears that limited research has been done to specifically and substantially address the way in which teachers personally adapt to and manage the factors of change and adaptability that impact on the nature of learning. Additionally, there remains an ongoing need for providing support for teachers with strategies for enhanced professional learning, practices and curriculum design (Ingvarson et al, 2005)

This study will focus on teachers' perspectives on *why* they are "agile", *how* they think and what *drives* them as practitioners, thereby going beyond previous studies that have focused primarily on *how* and *what* a teacher *does* to become a quality or great teacher. The study will explore those characteristics that identify agile teaching practices and attempt to understand how and why these teachers think, make decisions and consider changes, and how they align these practices with a current understanding of quality teaching.

2.2 Models of change

Discussions on the concept and recommendations for best or excellent teaching have previously focused primarily on classroom strategies, physical structures and seating arrangements that range from clustered, varied and functional (Lubawy, 2003). Other studies exhort multi-modal styles of instruction and response, students at the centre of the learning process, activity centred learning experiences for students, the teacher "engaged" *with* students and students "engaged" *in* work (Blankenship & Kim, 2012). Teachers have been encouraged to implement an integrated curriculum, promote differentiation and provide active learning opportunities (e.g. see North Carolina Public Schools, 2007). Programs such as the New South Wales Quality Teacher Program (New South Wales, Department of Education and Training, 2003) have devised models to provide teachers with scaffolds and criteria to gauge "effective" teaching or best practices when observing other teachers in practice. Observations of classrooms and student learning or behaviours, and using these to determine what is best practice are not usually continued over a sustained period; therefore data collected may not provide sufficient information to assist in the development of strategies and methodologies to connect teaching to the learning process (Nuthall, 2004). Studies have also considered how 'good' teaching is about the how and what of classroom practice and 'successful' teaching is focused on what the child learns (Chen, et al., 2012).

Models of change that favour incremental or fundamental change have experienced both success and failure in a range of circumstances. The successful drivers of embedded, purposeful change practices and behaviours have yet to be specifically identified, although current studies demonstrate that a hybrid of the two approaches (incremental and fundamental) may be most

successful, encompassing teaching practices that draw from varied traditions and respond to the needs, motivations and aptitudes of students (Chen, et al., 2012). Recognising that the three main styles of teaching could be considered as didactic, socratic and facilitative, the changing face of teaching emphasises a movement gradually away from didactic, teacher centred to supported, facilitated learning (Biggs & Tang, 2011; Griffin, 2003). This change necessitates the move towards different teaching practices, where the teacher facilitates learning activities and students are directed towards a deeper understanding of content (Martinez & McCrath, 2014). An increasing understanding of the way in which children learn is also driving models of change - these changes are impacted upon by the use of and interaction with technologies (Scott-Webber, 2012; Kihoza et al., 2016).

When provided with the right tools teachers often use technology and differentiating classroom strategies to assist students in developing personalised experiences in learning. However, teachers are also realising that the time required to become acquainted with the new technology and the subsequent distraction from core teaching is an issue to implementation and uptake. A good teacher knows how to not just ‘use’ technology but to make it add value to the teaching and learning process (Moyle, 2012; Kihoza et al., 2016). There are schools that recognise the need for change and have introduced more flexible practices, transforming the learning environment to support new technologies and spatial requirements (Martinez & McCrath, 2014). This study will go beyond the school based transformation model, and explore the characteristics exhibited by teachers who demonstrate these practices of change, with or without models of change being implemented in the school.

2.3 21st Century Practice

As we progress towards the middle of the second decade of the 21st century, one may question if current teaching practice has evolved to reflect the interplay between pedagogy and technology, and if educators have the capacity to reinvent the shape of pedagogy, enabling innovation with intent and purpose. Since 2000, the term “21st Century Teacher” has been used to describe teachers with the qualities and competencies deemed relevant and purposeful in contemporary times (Bernhardt, 2015). This requires the educator to embrace new technologies and integrate them into pedagogical practices with a value adding purpose. These practices exemplify the range of behaviours required, implementing ‘new’ models of learning such as blended, flipped, teaching for understanding, inquiry or project based learning, and utilising ideas and strategies gained from professional learning networks that are agreed to be components of quality 21st century teaching practice (Ertmer, Ottenbreit-Leftwich, 2010). Student (and therefore teacher) 21st century skills are identified as requiring critical thinking and problem solving, collaboration, initiative and agility and adaptability (Saavedra & Opfer, 2012).

Rapid technological transformation and the impact this has on life beyond the classroom, highlights the importance of a technology-based and -integrated learning environment for students (Prasad et al., 2015). To meet future challenges, it is essential that technology is integrated into the curriculum and that education programs provide fundamental technology skills for teachers and students alike (Liu, 2016). Recognised as an issue, low levels of technology skill acquisition for teachers and factors affecting change practices are often associated with the characteristics of the teacher, their professional learning opportunities and their access to resources (Beetham & Sharpe, 2013). Teachers continue to struggle with the acquisition of new skills (in particular, in using digital technologies) and connecting the technologies with learning and purpose. Inconsistent paradigms, lack of infrastructure, lack of research and inconsistent leadership (Englebrecht & Ankiewicz, 2016) are factors impacting on the development of practices that enable the successful intersection of pedagogy, technologies and learning activities, and the realisation of the possibilities that technologies have promised. Technology has been “oversold“ and “underused” (Cuban, 2012, p.195) and many teachers continue to perceive the use of technology as optional or disruptive to learning (Ertmer, Ottenbreit-Leftwich, 2010; Prasad et al 2015).

The alternative view regarding the focus of schools and teachers in the 21st century is one shared by connected educators globally. This view encompasses the recognition for learning to reflect a changed world in which we all exist, and an uncertain future for the students we teach. This drive for change is based on years of progressive thinking (Richardson, 2013) and new understanding about how the brain learns, what knowledge is (and is not) and the importance of the application of knowledge. The basis for this level of change is on understanding that students are immersed in information and content and that they need to learn how to sort through this abundance of information, ask the right questions, work through the information to find answers and develop habits of learning that will enable them to develop learning mastery.

If technology is the engine of change, then teachers must, in turn, be the agents of change in the classroom (Lukacs & Galluzzo, 2014). When technologies are integrated, there should also be a corresponding demonstration of changed pedagogical practices that enable the transition of practice from substitution to redefinition, enabling the technologies to re-shape the possibilities of the learning experience (Romrell, Kidder & Wood, (2014). Studies also support that in current times, teachers cannot be effective if they are not integrating technology into their practice (Liu, 2016). Teachers' views about themselves as agents of change, their willingness to participate in self-reflection, staff power relationships and cultural background may also be barriers to the integration of technologies and change in pedagogical practices (Ertmer, Gopalakrishnan, & Ross, 2001). Successful implementation of digital technologies and the adoption of changed practices requires focus on the knowledge of learners and an understanding of the desired learning. Developing a culture that focuses on teacher confidence and subsequent behaviour (practice) change are essential for the emersion of contemporary good teaching practices (Ertmer & Ottenbreit-Leftwich, 2010).

Twenty-first century skills require a practice that demonstrates agility, adaptation, relevance and attention to the transfer of learning. This study recognises that students can be educated differently and will attempt to build on current understanding of teaching and learning, and identify those teachers who exhibit the skills and characteristics of agility and adaptation, and whose practices value add to the learning environment in the 21st century.

2.4 Barriers to Adopting Change Practice

Strike and Posner's (1992) revised theory of conceptual change which is concerned with the parameters of rational belief, draws on the relationship of personal beliefs with social and cultural factors. To initiate and embrace change, a person must be aware of and dissatisfied with their current conceptions and conditions, understand new ideas and see that these will solve a problem (Hill, 2000). They must also believe that the time and effort required for new ideas is worthwhile. Oreg (2003; 2006) studied the degree to which individuals are predisposed to either accept or reject change, constructing a resistance to change (RTC) scale to measure *"an individual's tendency to resist or avoid making changes" (*Oreg, 2003, p. 680). Personality characteristics were explored and used to identify how whilst all people are opposed to change at some level, those with high dispositional resistance will be the ones who are opposed at a higher level (Burnes, 2014). The American Productivity & Quality Center (APQC, 2013), identifies the three main barriers to adoption of changed practice as being limited knowledge of current best practices, a lack of motivation (intrinsic or extrinsic) to make the changes for uptake, and an absence of the skills required for implementation (Moller et al, 2006). Studies investigating the relationships between teachers' perceptions towards the implementation and the new instructional practices also connect these to teacher attitudes regarding the congruence, ease of use and (perceived) importance of the desired practices (Budd et al., 1999; Keppell et al., 2015).

In education, the realisation that policy makers (reform drivers) and teachers look at change in classroom practice from different perspectives is another potential barrier to change implementation. Labaree (2012) describes these differences:

> *Teachers focus on what is particular within their own classrooms; reformers focus on what is universal across many classrooms. Teachers operate in a setting dominated by personal relations; reformers operate in a setting dominated by abstract political and social aims. Teachers draw on clinical experience; reformers draw on social scientific theory. Teachers embrace the ambiguity of classroom process and practice; reformers pursue the clarity of tables and graphs. Teachers put a premium on professional adaptability; reformers put a premium on uniformity of practices and outcomes (p. 158).*

Technologies themselves may at times, have become barriers to innovation and change, recognised by versions of the Technology Acceptance Model (TAM) (Venkatesh & Davis, 2000), devised to describe how users come to accept and use a technology. The model identifies that when users are presented with new technologies there are a number of external factors that influence their acceptance and use. These include perceived usefulness (ie will this technology enhance my job/performance?) and the perception regarding ease of use, social influence and facilitating influences (Venkatesh & Davis, 2003). Additional factors such as familiarity with the technology, general user skills and frequency of use also have an impact on teacher preparedness to use and integrate technologies into their practice. Research in recent years has shown that whilst technologies are more readily available for teachers, there is limited innovative use in classroom activities (Hull, Scott, & Higgs, 2014). In many situations, the barrier to uptake has been that teachers are provided with the tools and skill development in a decontextualised way, that is, learning how to use the technology but not in the context of the classroom. Some studies show that immersing teachers in the use of the technology, understanding the connection between pedagogy and technology, and the creation of usable resources may affect the way in which teachers change their use of technologies in learning activities (Hull, Scott, & Higgs, 2014). Ertmer (1999) discusses how first order (external) and second order (internal) barriers impact on the teacher integrating technology into the curriculum (Ertmer, 1999; Ertmer 2005). The findings of this study appear to continue to hold true for many teachers as Prasad et al. (2015) considered the characteristics of teachers who reported experiencing barriers to using technologies. Whilst recording that the barriers were based on lack of infrastructure, lack of support and lack of funding (first order barriers), through deeper inquiry, this group of teachers acknowledged that deeper more personal factors (second order barriers) included lack of motivation, lack of confidence and low awareness of ICT skills (Prasad et al, 2015).

A significant issue for many teachers is the lack of access to technologies that are easy to use, the reliability of the technologies and the available support, both from a technical perspective and a skill development one. The mistake often made by schools is that in their desire to “stay ahead” and maximise the quantity of technology, professional development for teachers in effective integration of technologies for learning is often minimised (Tytler, Symington, Malcolm, & Kirkwood, 2009; Woo, 2016), with teachers experiencing a divergence between technological and pedagogical knowledge. Models such as the technological, pedagogical content knowledge (TPCK) framework (Mishra & Koehler, 2006), based on work by Shulman (1986) on the pedagogical content knowledge (PCK) model have been utilised in education to attempt to bridge this gap. The frameworks emphasise how knowledge about and experience with technologies interplays with pedagogical knowledge and content to inform and improve practice. Nevertheless, it would seem that there remains in education, a broad belief that “using technology” in the classroom is sufficient connection with 21st century skills and that there has not (overall) been a great emphasis on a direct alignment or interplay between pedagogical practices, 21st century

learning and development of integrated technologies to value add to learning (Bernhardt, 2015).

Barriers that impact on teachers integrating technologies and adapting new practices include time constraints, limited skill, lack of confidence, fear of looking "stupid" in front of the students, a general lack of interest in using computers or knowledge about how they might be used (Jenson, Lewis, & Savage, 2002; Bernhardt 2015). Socio-cultural factors may influence barriers to learning about and using technologies in education. When teachers have relationships with other educators who are confident in using technologies and have strong pedagogical practices that support innovation, the impact is generally positive and may minimise perceived barriers (Woo, 2016).

2.5 Professional Development - Professional Learning

As identified in Chapter One regarding the need for further research, professional development of teachers has been a focus of study for some time and has frequently been utilised as a mechanism for reform, offering new methodologies, skills, techniques and programmes. The terms 'development' or 'learning' used to describe professional improvement in teaching practice have, for some time, been used interchangeably to describe professional growth for educators. The term professional development is a cultural shift in the vernacular from teacher 'training', the emphasis remains on something being done *to* teachers rather than *by* teachers (Easton, 2008). Professional development (PD) has traditionally focused on growing, expanding, progressing and gaining skills; skills that are identified by others as essential and valuable to the growth of the educator. Research supports that educators should also become knowledgeable and wise, know enough in order to change and be self-developing, that is, become learners (Easton, 2008).

According to the OECD Teaching and Learning International Survey (2009) PD appears to be rarely focused on the real needs of the teacher in supporting student learning, and may be of limited use once the teacher returns to the classroom (Jensen, 2013). Much of the PD experienced by teachers remains focused on pedagogical practice and curriculum, with a "top-down" approach (Bernhardt, 2015). It would appear that what *really* makes a difference for teachers and their pupils (Curtis, 2013), is encouraging sustained, embedded changes in practice, immersion in new learning activities, access to personalised expert knowledge, collaborative professional learning, peer support and connections between teacher and pupil learning (Wang et al., 2010). Increased responsibility for ownership over learning from the teachers and the recognition of the role of specialist expertise, along with deep collaboration and learning indicate greater success for pedagogical change (Dole, Bloom & Kowalski, 2016).

One study indicates that subsequent to many workshops and PD programmes, less than a quarter of participating teachers (on average) indicated that their classroom practices or strategies

changed or improved (Jensen, 2013). Many teachers indicated that instead, existing practices were reinforced, or that there was no obvious change. The problem is not that there is a lack of promising programmes, but that they may not be reaching and impacting on teachers in a manner that encourages change and maintains effect (Hill, 2009). There also appears to be a general disconnect between an understanding of the need for students to develop appropriate skills for learning in the 21st century and the professional development opportunities for teachers (Bernhardt, 2015).

Teachers give significant hours to PD, attendance at conferences and workshops throughout the school year. Generally, when teachers experience "one-off" workshops, conferences or courses the significance of the learning is short-lived and does not necessarily align with teachers' actual needs for pedagogical development. Studies focusing on teacher professional development, indicate that in order to encourage teachers to participate in substantial learning opportunities, there needs to be an obvious perception of benefit, with clear alignment to classroom practice (Hill, 2009; Woo 2016). Professional learning preferences of teachers in a recent study indicated that for many teachers one of the most popular choices for professional learning continues to include conferences (Bernhardt, 2015). Ironically, these have been shown to have little effect on subsequent practice, with delivery often maintaining a lecture approach with little opportunity to exchange ideas (Levin, 2012). Many professional learning opportunities are lost through lack of infrastructure, rigid timetables, presenters not observing the required time limits; the focus on one main person talking, presenting ideas and describing ways teachers should do things differently (Levin, 2012).

Professional growth supported by communities of learners is another aspect to professional development that is worthy of mention. There is the argument for "*situatedness"* in learning and significant teacher learning takes place when there are opportunities for practitioners to share their expertise on a less formal basis (Tytler, Symington, Malcolm, & Kirkwood, 2009). Socio-cultural approaches to professional learning such as peer mentoring can meet the needs of reluctant teachers, building on relationships, acknowledging personal attributes and preferences and building pedagogical knowledge. Building communities of practice and learning through intra-school connections has been explored for a number of years with varying degrees of success with time, relationships and resources remaining issues (Woo, 2016). These communities have realised new possibilities as technologies have enabled connections via social media, online networks and asynchronous learning opportunities such as MOOCs (Qi & Chau, 2016). Teachers who are effective professional learners appear to utilise the knowledge and expertise of specialist sources and seek advice to identify strategies that address the needs and goals of learning. They also use specialists (self resourced) to assist in gaining control over learning new approaches to pedagogy and information gathering (Hill, 2009). There is in contrast recognition also that in many circumstances, due to the inherent nature of the school "silo" there may be limited opportunities for teachers to grow in competence in the teaching of their own discipline (Hull, Scott, & Higgs,

2014), and this may affect professional growth and adoption of change practices.

Sustained professional learning in schools that embraces and supports teachers through the provision of tools necessary to reflect emerging technologies may address the issue of disconnect and transfer that is reflected in research on professional development success (Hill, 2009; Dole et al., 2016). When there is an emphasis on the intersection of technical and pedagogical knowledge and skills and the availability of support mechanisms, teachers adopt practices that utilise these technologies (Lukacs & Galluzzo, 2014). A personalised approach to professional learning where teachers have opportunities to engage in various styles of professional learning is regarded as preferable (Hill, 2009; Jensen, et al., 2002; Dole et al., 2016) Combining workshops, discussions and on-going support with the teacher's own subject interests has also proven beneficial (Jenson, et al., 2002). Much research has been done in recent years identifying the characteristics of high quality professional learning and this has identified features that led to benefits for students and teachers as well as the nature of the learning experiences of the teachers themselves (Valerie, 2012; Dole et al., 2016). Professional learning is a key focus in the exploration of the characteristics of the agile teacher. Interest in the impact of professional learning, relevance and approaches taken by the agile teacher will build on existing understandings of the effectiveness of professional development/learning for teacher practices.

2.6 Conclusion

The chapter has considered previous research focused on teacher practice and the findings from these studies have influenced the development and direction of the research undertaken. The research literature demonstrates that whilst much work has been done concerning the nature of teacher practice, the gap that exists lies in the identified focus of this study - that is, exploring the characteristics of agile practice demonstrated by teachers in response to the changes of the 21st century. The literature supports the proposed study in recognising the significance of technologies in learning and in showing how the needs of learners have changed in the past twenty years. It notes the difficulties, challenges and motivating factors for teachers in the adoption of change.

This study has examined these findings in a different light, considering the impact of potential barriers and facilitators affecting the emergence of agile practices by teachers. The literature study also notes the importance of professional learning, identifying the researched differences between professional learning and professional development and the impact on sustainable change practice.

Overall, the literature study has been used to establish a foundation for the need for the proposed research. Much work has been done in previous years in the area of teacher practice, and this study intends to recognise existing findings, whilst exploring a new direction with the primary focus

of establishing an understanding of how agile practices develop and the factors that influence this development (Dole et al., 2016). This study has been exploratory in nature, building on established research into quality teacher practice, contemporary education and professional learning, searching primarily for the factors that drive and differentiate quality, adaptability and innovative teaching. The study has attempted to establish a relationship (or understanding) between agile teaching and quality teaching, considering the broadly accepted understandings of quality, diverse opinions regarding the use of technologies in learning and the range of thoughts regarding professional development and learning for teachers.

Chapter 3 - Research Design and Methodology

3.0 Introduction

The aim of the study has been to identify those characteristics of teachers that would categorise them as agile, and then identify “what makes them tick”, considering how and why they do what they do and the factors that influence the decisions they make in and beyond the classroom environment. This understanding is aimed at building a useful theory of practice that may inform and influence a wide range of educators.

3.1 Methodology

The study overall was qualitative, empirical in nature, exploring evidence of experience through inquiry, narrative and reflection (Vidich & Lyman, 1998). Data generated at each phase were used to develop and direct the methods used for the next phase of the study. The adoption of these approaches and processes was determined largely by the parameters of Grounded Theory (GT) in that there was no intent to prove or disprove a theory or hypothesis, but rather to explore what was known about the problematic. The intention was that the data generated would inform and direct each subsequent phase of the research, identifying factors that were of value and worthy of further research or study (Strauss & Corbin, 1990) and this process would result in the building of theory. True to the grounded nature of the methodology, no attempt was made to define the concept of an agile teacher at the start of the project, but rather efforts were made to develop an understanding of the characteristics of an agile teacher from the data collected. A qualitative research paradigm was chosen, as the aim was to establish an in-depth understanding of elements of human behaviour, in this case, teacher practices and their characteristics, and the influences that govern or impact on such characteristics.

The process was undertaken by combining methods, principles and processes from Grounded Theory (GT) and Narrative Inquiry (NI) methodologies, with the integration of these methodologies evolving during the course of the investigation. It is believed that by combining methodologies, research results may be better suited to translate into the domains of actual practice (Seaton, 2005). NI which uses story to research and understand the creation of meaning, is considered to be a qualitative inquiry approach, utilising and considering interdisciplinary “lenses” to consider and interpret the narrative of the participant (Denzin & Lincoln, 2005). In this study, the combination of GT and NI was used to generate the story of the agile practitioner, and to extract meaning from experiences. This methodology falls under the accepted term “combined methodological approach” (Swanson-Kauffman, 1986). The term refers to the way in which the

researcher combines methods, processes and principles that are usually aligned with specific methodologies, at various stages throughout the study in order to meet evolving objectives (Lal, Suto & Ungar., 2012). The use of a combined methodological approach reflects the desire within the study to demonstrate a clear, in-depth inquiry considering all aspects of the questions being investigated. The choice of research methodologies and directions was governed by the research questions, and the ways that my conceptual understandings of these questions evolved as the study progressed. Denzin and Lincoln suggest (2005) that the choice of research practices depends on the questions that are asked and the questions depend on their context (p. 4). The sub-questions and changing directions of inquiry were re-generated at each stage, through categorising and contextualizing responses from reflections and issues as they emerged; the methodologies chosen at various stages in the study also evolved as a response to a growing understanding of and interest in emerging characteristics and practices.

3.1.1 – Qualitative Research

…The qualitative researcher is a bricoleur (handyman)…using the aesthetic and material tools of his or her craft, deploying whatever strategies, methods and empirical materials are at hand…

(Denzin & Lincoln, 2005).

This study began with a broad topic of interest underpinned by a conceptual framework that would shape the processes through which an understanding of the topic would eventuate. Qualitative research is in essence, an interpretive approach that encompasses a range of strategies and techniques that elicit insights into and knowledge of interconnected phenomena, patterns and behaviours. For this study, where patterns of experience and reflections of participants were being sought, this seemed to be the best paradigm to interpret the story of the participant. The essential elements of qualitative research enabled the study to focus on experiential discoveries, generating data that were rich in description and provided opportunities to investigate and re-investigate through systematic, rigorous inquiry (Lapum & Hume, 2015).

Throughout the study, I worked in a non-linear fashion, as suggested by Khandar (2009), who indicates that the researcher should focus on three main elements – noticing, collecting and thinking, and should move as required between data generation, analysis, looking for connections, reflection and questioning. I sought to identify the characteristics of agile teachers through investigating patterns and descriptors that emerged from surveys and interviews, looking for meanings presented by participants in their responses to each step in the study. The qualitative paradigm enabled me to consider how the agile teacher thought, reacted to a range of influences, redesigned learning experiences and responded to the complexity of the learning environment. Through exploring the personal reflections of agile teachers through surveys and interviews, variables that were difficult to quantify and theories of explanation that were previously elusive, were identified.

I considered the significance of knowing that the respondents may have a range of perspectives within their reality of experience and that the stories might vary depending on audience and other external factors. I was aware of the possibility of a "gap" between espoused practices and observable practices, but as the focus was on the agile teacher's perspective, this gap was not seen as a major issue for the study and therefore not explored at this time. A key element of qualitative research is an understanding by the researcher that [participant] reality is based upon perceptions that are different for each individual and change over time and context. I was primarily concerned with the emic perspective, searching for meaning within the experiences, feelings and perceptions of the participant, gaining an "insider's" point of view rather than imposing a rigid framework of structure on the study.

3.1.2 – Grounded Theory

Grounded Theory (GT) differs from other qualitative research approaches in that it is not focused on proving a theory but rather relies on the building of a theory that accounts for and explains a particular situation or behaviour. The aim, as Glaser states, is to discover the theory that is implicit in the data generated throughout the research. Data collection and analysis includes but is not limited to video, images, interview, field observations, text etc, with specified procedures for data analysis such as identification of coding and categorizing data (Kolb, 2012). It is sometimes referred to as a "general" research method - a research tool that enables the researcher to search for and examine social patterns and structures of interest in increasingly narrower areas of focus.

Qualitative considerations contributed rigour to the study through the integration of questions, thought and the subsequent emergence of inquiry (Shermann & Webb, 2001). Utilising the structures in the model in *Figure 3.1.1*, developed by Gasson (2004), I was able to implement a *reflexive approach* throughout the analysis, continuously reflecting on the data collected, and examining existing assumptions, situational dynamics and preconceptions. The model guided the revisiting of ideas and establishment of overarching categories and relationships, ensuring that the process of interpretation and theoretical development remained true to the methodology underpinning the study.

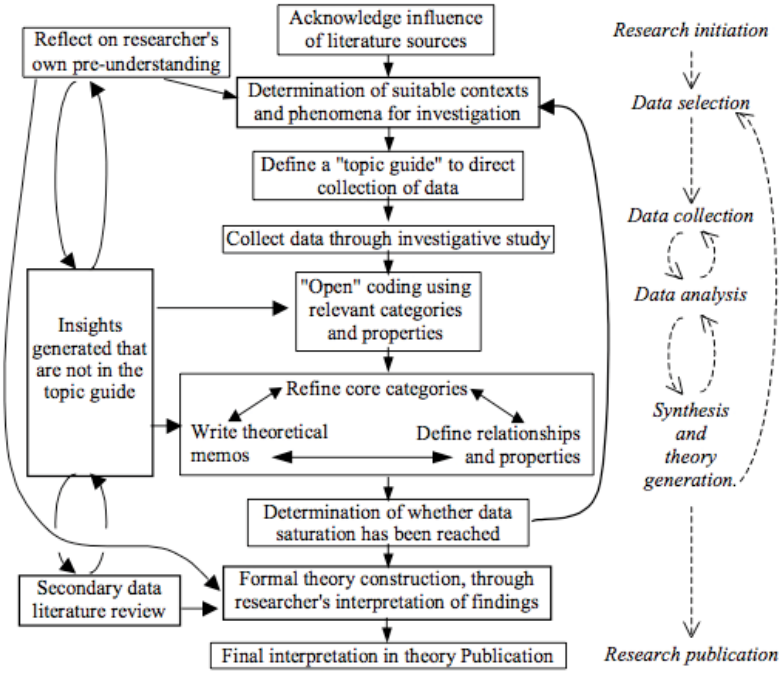


Figure 3.1.1 Diagram of a Reflexive Grounded Theory Approach (Gasson, 2004)

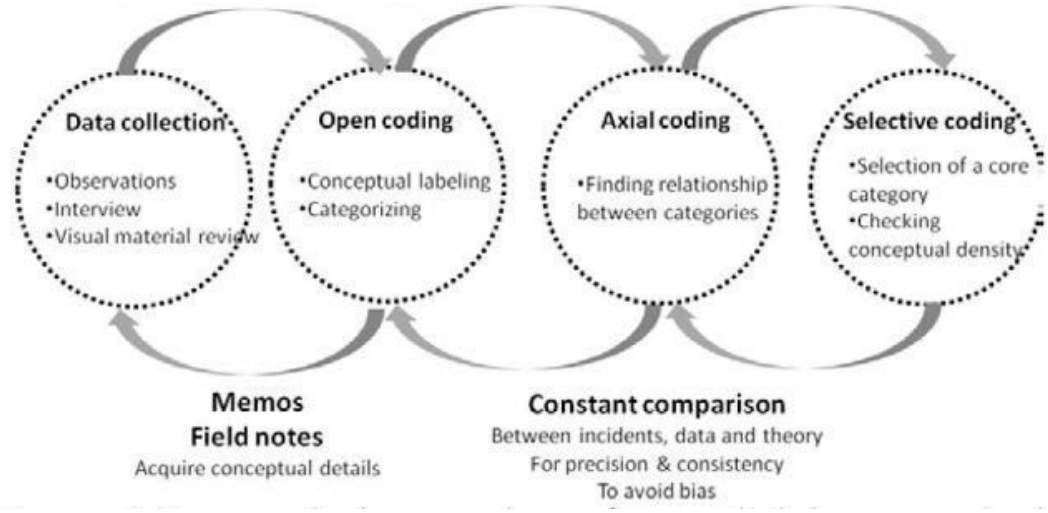


Figure 3.1.2 – Data analysis procedure of grounded theory method (Cho & Lee, 2014 p.9).

As data were collected, I was able to utilise a range of strategies and techniques for this purpose, including social media, global networks and the potential of both synchronous and asynchronous strategies to connect with participants, unpack their experiences and guide them to reflect on purpose and ideas to generate responses to questions asked. GT, in essence, is the emergence of a series of hypotheses generated through circular analysis of data that contribute to the development of an inductive theory (see Figure 3.1.2). As I processed the data generated, I was able to identify substantive information and consider relevant implications of experiences – sorting the data to attempt to explain the significance of the phenomenon of interest being investigated (Glaser & Holton, 2004).

Whilst there are a number of techniques possible for GT analysis, coding of data is the primary method of sorting information and developing a hierarchy of importance. Open coding is the first "layer" of analysis, where the researcher identifies major categories or "themes" that occur throughout the data generated and collected. Selective words and phrases are categorised into groups, creating broad umbrellas for the next phase of analysis. Codes are constructed through naming data, defining and labeling, choosing words that arise from the language of both the researcher and the participant.

During the open coding phases, Glaser (1978, p. 57) provides three separate questions for scaffolding structure and generating top-level categories:

1. "What is the data a study of?"
2. "What does the category for this incident indicate?"
3. "What is actually happening in the data?"

Experimenting with open coding, I was able to work through several iterations of categories and codes, making sense of the data, developing an understanding of participants' standpoints and perspectives, while aiming to manage preconceived conjectures. The process of open coding enabled me to look at the data line by line or moment by moment, differentiating between and comparing incidents, interacting with the experiences and responses shared, defining and redefining codes, looking for patterns between categories (Charmaz, 2006). At times, when categories became saturated, this gave reason to pause and take note of new directions that were appearing in the data. By using constant comparative methods (Glaser & Strauss, 1967) analytical distinctions were made, where I was able to look for similarities and differences by making comparisons, analysing sections of sentences or reflections, looking for connections, disconnections and other distinguishing constructs. Constant comparison is used to see that the data continues to support the categories that are emerging from the coding process and resolves "data overwhelm" (Glaser, 2003, p.24), reducing the likelihood of collecting redundant data. Looking for comparisons and similarities in the surveys and then from one interview to the other I was able to identify categories and their properties (these would become sub-categories). This made the coding process somewhat easier as once I had identified "core categories", sub-

categories could be nested within these. This process was long and tedious, however, after a time, core categories emerged, establishing overarching themes under which code sub-categories could sit. The categories and codes became increasingly obvious and naturally connected as I sorted through interview transcripts. As recommended by Glaser (2003), I endeavoured to focus on one category at a time - Glaser suggests that this is the preferred way to analyse the data as it avoids confusion. Interestingly, Glaser (2003) also recommends against recording interviews and/or using specific transcripts for analysis of data, and suggests, rather, that the researcher develop a system of memorizing significant points and re-interviewing if greater depth is required. My experience with writing the transcripts from the recorded interviews (most of my interviews were audio recorded only, as the majority of interviewees responded asynchronously online rather than face to face) enabled a sense of immersion in the discussion and a deeper understanding of the narrative of the participant. This is supported by Dowling (2012) who discusses the significance of being fully immersed in the analysis process through transcribing, in addition to avoiding the loss of data authenticity when relying on memory and recall.

At this stage in the analysis process, *in vivo* codes, derived from the participants' language and terminology – the specific wording or terms used by an individual – was used as a way of preserving the integrity of the descriptions shared by the participants. *In vivo* coding involves the researcher assigning a label to a section of the data, using a word or phrase directly from the transcript. These codes are characteristic of social worlds, reflecting terms that may be commonly used within a setting or specific environment, and may enable a deeper understanding of that environment, as they are representative of a phenomenon and guide an understanding of experiences (Chong & Yeo, 2015). *In-vivo (Latin: In life)* codes are significant when using GT as they are a direct reflection of the thoughts and ideas coming from the participant and reflect their conceptualisations and terms. They provide access to a form of interpretation and understanding of concepts discussed by the participant. For example, in this study, participants may use the term "*tecchy*" to refer to the type of teacher who seems comfortable and confident with using technology – the "go to" person when you need help or direction when using technology. In order to achieve this level of analysis and interpretation of the interview data, I had to once more, disagree with Glaser's recommendation for not creating transcripts: for authentic analysis and categorising I felt it was imperative to have the actual text communicated by the interviewee rather than my anecdotal notes made from the interview recording.

The second stage of the coding process is referred to as *axial coding* and is where the researcher establishes relationships within the data, relating categories to sub-categories. Strauss (1987, p64) refers to axial coding as the construction of "a dense texture of relationships around the 'axis' of a category." At the same time as the researcher is coding, the process of "memoing" should be undertaken as it captures the formation of ideas and concepts as they emerge. Memos help to shape the continuing reflective process of analysing ideas about the codes and data, making sense of the range of ideas that emerge as data are analysed (Glaser, 2013). When memoing the researcher is able to freely annotate notes, make suggestions and create connections that track

main ideas during open coding and selective sampling. Evans (2015) discusses memoing as significant because the memos ensure that observations and points of interest are not forgotten over time. They were useful for communicating comparisons and connections, creating notes for further development of relationships and conclusions about these comparisons throughout the more formal processes of analysis (Holton, 2010). Glaser (2003) notes that memoing is a high priority when using GT for research and is useful in capturing significant notes that contribute to the emergence of the big ideas and emerging theory (Elliot, 2014). Memoing also gave credibility to the consideration of my own ideas throughout the process (Charmaz, 2006), knowing that in this methodology, my perspective is also seen as representational of another view in the study and therefore an acceptable contribution to the development of theory.

An essential aspect of GT is theoretical sampling which differs from other forms of "sampling" in traditional qualitative research designs. Theoretical sampling can be defined as "the process of data collection for generating theory whereby the analyst jointly collects, codes and analyses his data and decides what data to collect next and where to find them in order to develop his theory as it emerges" (Glaser, 1978, p.30). Theoretical sampling is used by the researcher to generate and develop theoretical data, and can be used to provide structure to the data collection and analysis process.

GT was used in this research study to foster a process of discovery, enabling the emergence of characteristics, ideas and theory through the generation and analysis of data, where there was no preconceived outcome or hypothesis to support. The processes and continual narrowing of focus in GT enabled me, as the researcher, to be immersed in the data, providing explicit guidelines through the use of coding, memoing and theoretical sampling. The study was able to use empirical data to generate concepts and theories and to determine the directions of the study as these emerged (El Hussein et al, 2014).

3.1.3 – Narrative Inquiry

Narrative Inquiry (NI) was used in this study to capture a broad scope of ideas about the characteristics of the agile teacher, through the stories shared by participants. Narrative is the "whole story", beyond the components identified in coding and categorising responses. NI is an extension of direct narrative, focusing on elements of construction and the development of meaning from unanticipated elements of the story and enables participants to make meaning of their experiences (Hendry, 2009). In this study, the participant interpretation of experiences was significant, as the characteristics and practices being explored arose from teachers' reflections and reporting of the personal classroom and learning experience. Canagarajah (1966) argues that narratives function in opposition to elitist scholarly discourse – providing opportunity for disparate groups to participate in knowledge construction. This concept was valuable in the context of this study as participants were self-selecting (see section 3.2) and were drawn from a wide variety of social and educational demographics, and consequently it was important to gain their thoughts about the construct of agility.

The narrative aspect of the inquiry, adds the human experience to the data being generated through interpretation, enabling the research to gain deeper understanding of the participant perspective. In narrative research, if a finding is significant to the story of the participant, then it can be considered important and validated. Narrative inquiry does not claim to represent the exact "truth", but rather aims for "verisimilitude", that is the trustworthiness of notes and transcripts is underpinned by the believability of the narrative, which is borne from the perceived authenticity of the story (Abbas, 2016).

Narrative inquiry also connects the researcher and participants to both the social phenomenon being explored and the individual's story, enabling a connection between scientific and artistic research methodologies (Cooper, 2010). In his book *Narrative Knowing and the Human Sciences,* Polkinhorne (1988; 2007) supports the theory that narrative is a way through which people give meaning to their experiences, actions and non-permanence. According to Connelly and Claninin (2006), the narrative inquiry comprises a three dimensional framework of "temporality, sociality and place" (p. 479). The significance therefore, in the context of this study, is that these elements establish a deep connection with personal experiences where narrative is the best way to recount events and situations that contribute to a social construct. Narrative inquiry enabled the participants to share reflections and observations of practice, describing personal and social experiences, thus transforming experiences in a way that connected with and made sense of the social world. The study was designed to be reflective of practices that educators might not have previously considered as significant to their practice; providing an opportunity for participants to tell their story [narrative] and was, therefore a good choice for generating purposeful data. As both methodologies utilise interview as a method of data collection, there was an alignment of purpose, with the NI focus being on the story within the response and providing the opportunity for the participant to "tell their story" using questioning (open ended and recount) and the use of visual metaphor to encourage the participant to engage on a personal level. The use of GI in the analytical phase enabled the establishment of relationships across the range of interviews, whilst the NI approach ensured the integrity of the story remained intact.

There is a variety of perspectives on using a combination of GT and NI, given the concern, noted by Lal, et al., (2012) that the two methodologies, whilst both qualitative, come from diverging paradigms ie., post-positivism and constructivism. However, there are a number of studies that have utilised this approach (eg Bailey & Jackson, 2003, 2005; Cohn et al. 2009). It seemed a natural congruence for this study to combine methodologies that focused on the psychological and social processes of the inquiry, together with endeavouring to understand the experiences of the practitioners concerned. Although GT and NI do have differences, it appears that they can work together to assist the researcher to understand social processes, in particular, the understanding of human processes. Each methodology also has versions of accepted implementation, with similar methods of accepted sampling and data collection. The most significant factor to be aware of when combining methodologies is the expertise of the researcher across both disciplines (Lal et al., 2012), with the need for the researcher to be well informed, to know strengths and

weaknesses and to be able to remain authentic to both, whilst drawing on the potential they provide for the research study (Venkatesh, Brown, & Bala, 2013). This idea has been developed further with the suggestion that mixing methodologies is advantageous as *" the design of a study [comprises] several different dimensions (from many different typologies) that researchers can flexibly integrate to meet their studies' purposes"* (Venkatesh, Brown, & Sullivan, 2016).

3.2 Research Design

The study used qualitative methods of survey and interview to collect the data that would address the primary research questions. The goal was to connect with as many educators as possible, using social networks, the Internet and personal connections for a broad distribution of different components of the study. Participants in the surveys were connected through professional networks and then via social media including LinkedIn, Twitter and FaceBook. Section 3.1 details the way this was done. Aside from the pilot survey, participants were completely anonymous and not necessarily within my known network of professional or personal connections. Using social media I was able to disseminate the main survey globally with a final distribution that represented a range of teaching geo-demographics. Finally, the participants for the interviews self-selected and could either complete the interview asynchronously online, face to face or using a range of web interfaces.

3.2.1 – Survey development

For this study, two surveys were developed. Several sampling methodologies were used, the first being *convenience* sampling followed by *snowball* sampling. Snowball sampling is also referred to as *chain sampling, chain referral sampling or referral sampling (Berg, 2006; Dusek et al 2015).*

Convenience sampling is a type of non-probability (non-random) sampling technique. Participants are not selected randomly, but rather because they are a “convenient” group available to the researcher. This sampling technique was chosen for the starting point for the study as it enabled the researcher to connect with groups of educators known from years of professional practice and through professional networks, for initial piloting of the first survey with no specific inclusion or exclusion criteria used to select participants (Denzin & Lincoln, 2005). This group was contacted primarily through email, LinkedIn and FaceBook. In this way, the wider education sector was also not “saturated” with the research study earlier than desired. The initial or pilot survey was emailed to this group of educators in the researcher’s personal and professional networks (Appendix A) to ascertain interest in the study, to construct a scaffold of what educators believed “agile characteristics” of teachers to “look like” and to determine effectiveness of the survey style and questions. The preamble, (see below) provided a brief description of what the overall survey was seeking to find. The questions were constructed to gain interest in the study and to determine the ideas of existing teachers as to the types of descriptors that might be applied to an agile teacher, the general behaviours expected and observations that might be made of this type of teacher in

practice. Reflecting on responses it became clear that the actual questions asked focused more on profiling the teacher responding to the survey for the first part, and then asked for descriptors of what they thought an agile teacher might look like. As profiling was not the intent of the research and the questions asked were not sufficiently open-ended to provide authentic responses, it was clear that the actual survey for the study would require revision. Nevertheless, the pilot study was useful in determining interest and in guiding the redesign of the survey that would be used for the generation of data for the proposed research.

Preamble in email to network of teachers: *The aim of this study is to identify the characteristics of "agile" teachers – those who not only adapt to, but also take advantage of significant changes…responding to the ever changing world as we know it, with globalisation, demographic shifts and emerging technologies making the education world an unpredictable place...*

Question examples:

1: Select the words from the list that best describe your current teaching practice. Choose as many as are applicable.

2: Select from the list below any words or phrases that best describe what you think an agile teacher would be?

For both questions choices included: reflective, flexible, adaptable, innovative, exploratory, intuitive, creative, traditional, inclusive, organised, evolving and passionate. Communicative…

3: Assuming all teachers are "good" teachers, how can we tell if a teacher is "agile"? In addition to "good" teaching practices, agile teachers also: ……..
Response choices included: Have enthusiasm for subject matter, make decisions as a response to change, embrace change with enthusiasm, use emerging technologies with enthusiasm, take advantage of change, adjust easily to challenging situations…

For a complete list of questions and responses, see Appendix A

In the second phase of the study, a new survey (Survey 2) was constructed. This survey was developed after reflecting on the types of responses generated from the pilot survey, with a focus on more open-ended questions, enabling participants to respond more richly on a personal level, using observations, perceptions and experiences to formulate answers. In this phase *snowball* or *chain sampling* was utilised. Snowball sampling, a non-probability technique, is where the first set of respondents may be selected according to probability or non-probability methods and then additional participants are connected to from the first respondents. This method is used when the researcher wants to access a wide

representation of participants, and relies on semi-targeted groups passing on the survey questions to others in their networks who may be interested (Noy, 2008). In this study, a direct link to the survey with a short explanation regarding the purpose of the study was added to the researcher's own FaceBook site (accessed only by friends - many of whom were colleagues or previous colleagues), Twitter hash tagged discussions such as #edteach, #edtech, #blendedlearning, to the researcher's LinkedIn profile, and posted on several education discussion forums in LinkedIn, including "21st Century Education" (12,902 members); "Educational Leadership" (66,281 members); "Innovative Learning" (6, 031 members) and "Apple Distinguished Educators" (1,864 members). See invitation in Appendix H. Participants were encouraged to pass the link on to any other educators they considered might be interested, thus fulfilling the desired outcome of snowball or chain sampling.

The purpose of this second survey was to reach a wide and hopefully global network of participants, who could reflect on the questions openly and with anonymity. The responses from this survey were then used to generate deeper questions that would be used in the interviews in the third phase of the study, and to recruit potential participants for this interview phase.

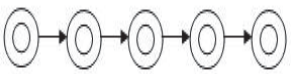
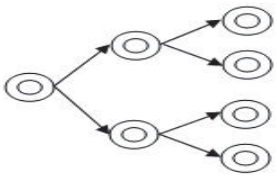
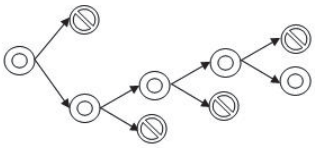
Linear snowball sampling	Exponential non-discriminative snowball sampling	Exponential discriminative snowball sampling
		

Figure 3.2.1a: Snowball sampling

Retrieved Sep 01, 2015 from Explorable.com: https://explorable.com/snowball-sampling

The second survey was conducted utilising a combination of exponential non-discriminative sampling (researcher connects to convenience group, then they send survey on to their convenience groups or other connections in their professional network) and a more contemporary approach - *virtual social media snowball sampling* technique - utilising social media, particularly using Twitter hash tags, Facebook and LinkedIn groups (Figure3.2.1b). The social media technique was used in this study to broaden the reach of the survey, accessing respondents from across the globe and expanding the geographical scope and increasing the flexibility of perspective (Baltar & Brunet, 2012) as greater diversity of respondent population was made

possible through a range of social networks. Figure 3.2.1c (below) demonstrates the exponential capacity of social networking, with potential respondents being linked through numerous connections.

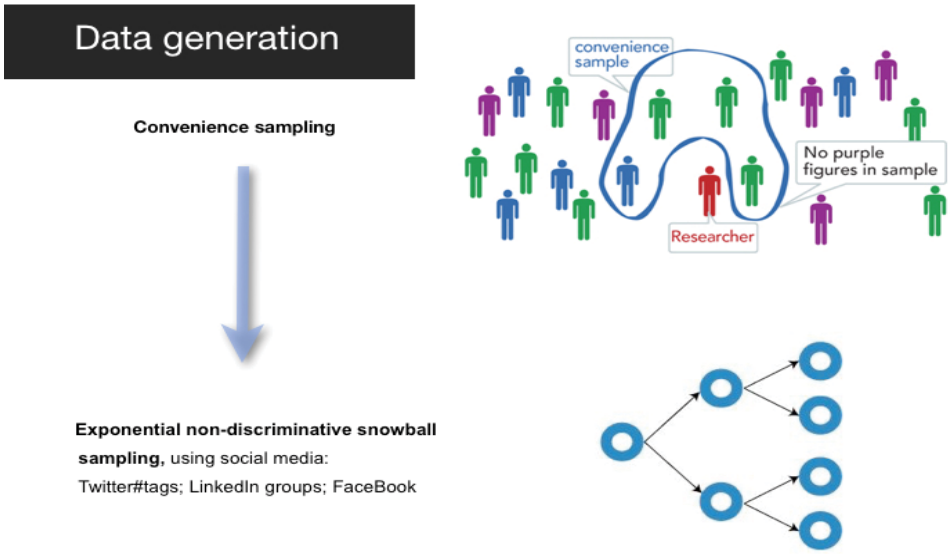


Figure 3.2.1b – Data generation – convenience sampling to exponential non-discriminative snowball sampling

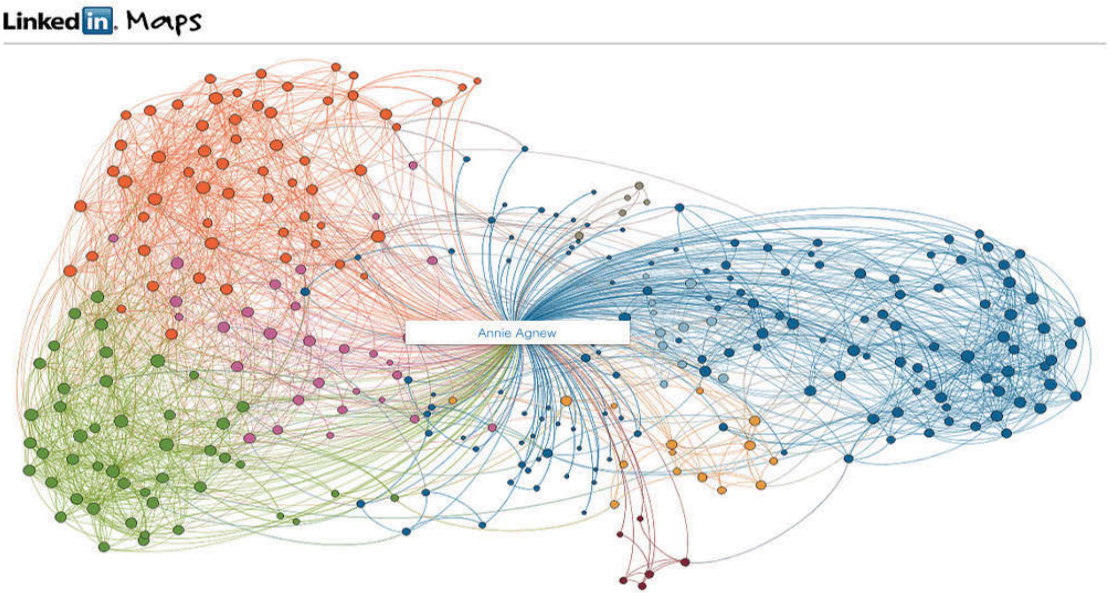


Figure 3.2.1c: Global connection networks.

The colours represent different "layers' of direct and indirect connections.

Researcher's own image

Using social media, the survey referral did not have to rely on personal recommendations, but rather on semi-targeted, [but still] non-specific notifications through either social postings, group discussions or hash tags. The groups and hashtags were selected from randomly selected educational social communities, following commonly used hashtags (e.g. #edchat, #edteach, # flipclass) in educational discussions on Twitter. In a virtual social network connections are made through known and unknown individuals, determining acceptability through other filters such as belonging to discussion groups, like-minded interest groups and random connection opportunities.

The advantages of using *virtual social media snowball sampling* were that this method of sampling increased the reach of the survey more rapidly with a wider scope than could otherwise have been achieved using traditional snowball sampling. This technique reduced the chances of the network of participants being connected to me, as the researcher, either directly or through tiered levels of connections – ensuring that the respondents were self selected, drawn from groups unknown to me, thereby eliminating bias. The concept of "weak ties" as illustrated by Mark Granovetter (1973) explores the value of connecting those outside our immediate networks to a wider circle of social connections, thereby reaching a widespread representation of the desired group.

In response to a global trend of declining response rates to surveys (Dusek et al, 2015), the use of social networks for distribution enables survey convenience to both the researcher and respondent, reducing turnaround times, and with distribution and responses completed electronically. Although still a saturated field of survey delivery, due to global dissemination facilitated by the snowball effect, the opportunity to find individuals willing to respond is increased in contrast to more traditional methods of survey distribution. Virtual distribution enables access and completion of the survey at the convenience of the participant, with the data, collation and analysis electronically generated at the convenience of the researcher (Brickman-Bhutta, 2012). Nevertheless, surveys in all forms of distribution appear to be experiencing declining rates of response which is becoming an issue for data collection. This phenomenon is sometimes referred to as "survey fatigue" and results from survey/feedback saturation largely through email and social media (Porter et al., 2004).

Building on responses from the second phase survey, further questions were developed to tighten the lens of inquiry for the third phase of the study, the interviews. Participants were recruited through *self-selection sampling* (non-probability sampling technique). At the completion of survey #2 (Appendix B) respondents were given an option to volunteer for further participation in the study. At this point, they were not asked if they thought they were "agile", just if they would like to participate in interviews. The option was given to either go directly to the online interview platform (Jotform) or to be contacted to arrange a face to face interview. Participants were only asked if they considered themselves to demonstrate the characteristics of an agile practitioner at the interview phase of the study.

3.2.2 – Interviews

In qualitative research studies, the main purpose of interview is to gain the perspective of the participant, guided by questions that have risen from an earlier aspect of the study. When using interview as a component of GT, the researcher relies on uncovering the participants' reconstruction of lived experiences and subjective reflections. Questions for this study were open ended, encouraging the participant to explore and reconstruct their experiences and build upon reflective discussion. As meaning is socially constructed and changes over time, the purpose of interviews was to elicit the story of the participant as an external discussion of their lived experience (Glaser, 2004). For this study, semi-structured interviews were used for primary data collection. Depth was enabled as the interview questions were purposefully structured in such a way that key questions were used to define the primary direction, whilst allowing the participant to diverge as desired, pursuing their own journey as the discussion unfolded. This flexibility allowed for the narration to take its own course without restrictions by pre-determined configuration of questioning achieving a specific outcome.

Invitations were provided at the end of the second survey for interested respondents to volunteer for the next phase of the study if they felt that they fitted their own understanding of an agile practitioner, according to their responses to the survey. Twenty-four individuals self-selected to complete this phase of the study – the interview. The advantage of self-selection is that participants could be expected to complete this phase as they have made a voluntary decision to contribute and feel they have something to offer that would benefit the study. When enabling self-selection, there may be bias based on personal perspectives, which could impact on the interview data. However, participant motivation to contribute, assumed identification of personal "agile" characteristics and the overall nature of the study, led me to believe self-selection would provide the best results. Participants were asked to self-select based on their willingness to participate and their perceptions of their own agility. Question 1 in the interview schedule presumed participant self- selection based on their own identification of being an agile teacher in that it asked: *Discuss which picture you chose from the gallery above and your connection with the imagery - talk about why you chose that particular image, how it reflects you as an agile teacher and/or how it helps you to describe your perspective regarding your characteristics as an agile teacher. (Appendix C).*

It is possible that respondents who initially self-selected did not continue with the interview after they had seen the first question, which probed their agile practices. It is not known how many respondents who initially self-selected to participate in the interview phase actually completed the interview, as an option was given to link directly to the interview resource online. Ethical processes were followed in all aspects of the study though provision of a link to the full ethics approval and consent information, with a check box for interviewees to select if they agreed to the conditions of participation (see appendix C). The interview resource used was Jotform, an online survey application that enabled a range of techniques to both provide questions and for the

interviewee to record their responses. Jotform enabled images, video and text for questioning (not unlike a range of online resources), but what set it apart from other resources was that it enabled the interviewee to audio record their discussion directly into the survey. A percentage of those who were interested may not have completed the actual interview using Jotform (online) as the resource only records information once a response is created. One participant began the interview online and struggled with the technology, opting thereafter to answer the questions in digital format and email a document when completed. Of those who opted for direct contact, approximately 60% completed the interviews - see Figure 3.2.2a, 3.2.2b and 3.2.2c for further information regarding the demographics of interview participants. Demographic information includes geo-location, number of years of teaching experience and the pseudonyms provided for the research study. There is no information regarding individual's primary, secondary or tertiary teaching experience, as this data was not generated during the interview process. In hindsight, this was an oversight as this information would have proven useful during analysis.

Interviews were constructed from an in-depth, phenomenological basis, using primarily asynchronous online strategies. By utilising an online asynchronous approach, the integrity of both GT and NI was assured in that the participant could not be influenced during the "interview" by the researcher deliberately or inadvertently and respondents were encouraged to talk freely, responding to the question stimulus in their own way. The story of lived experience was the outcome desired, with questions being framed to elicit personal narrative. Respondents had exactly the same questions, with no additional commentary or influence – not always possible in a face-to-face interview. This approach also eliminated issues such as availability, location and limitations of needing a certain amount of time to interview a specific number of participants. By utilising an online resource, "Jotform" (see appendix C) participants were able to complete their interview at a time that suited them, in stages, reflectively, without input from others and with time to consider responses. The aims of the questions were to elicit authentic reflections from educators on their practices, thoughts and responses to previous data generated from the survey.

Sample questions included:

Q2: Reflecting on survey respondents' descriptors of agile teacher characteristics in the word cloud image above, please discuss the characteristics that you consider make you an agile teacher.

Q3: Do you have any doubts or hesitancies about categorising yourself as an "agile" teacher?

Q5: Can you describe an incident or occurrence that demonstrates you as an agile teacher?

Q7: Why do you teach the way you do?

In contrast to Jotform, other online resources do not enable audio recording and I believed that better responses would be achieved in an oral response from participants, reflecting a more traditional form of interview for the individual. Collecting oral responses from participants can also be advantageous as it affords the interviewee greater "thought flexibility", reducing the need to

focus on the accuracy and structure of a written response. Jotform also provided flexibility, with easy addition of text and images to support the prompting questions.

The online interview style enabled the possibility of any number of participants to be "interviewed" in the same timeframe, which is impossible for a researcher using more traditional methods of contact. The interviews were submitted through Jotform, enabling the researcher to listen to responses for each question separately. The benefits became more obvious once interviews started to increase in number, with the individuality of each participant's responses becoming evident. This phenomenon will be explored in greater depth in Chapter 4.

Geo-location	Teaching experience	Gender

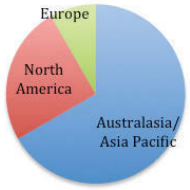
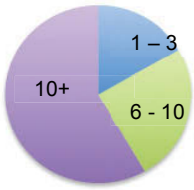
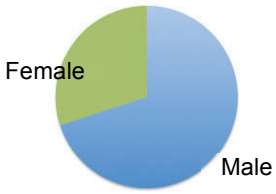

		

Figure. 3.2a – Geographic distribution of respondents for Interviews	**Figure. 3.2b – Years of teaching experience of Interview respondents**	**Figure. 3.2c – Gender distribution of Interview respondents**

Whilst twenty-four respondents to the survey selected to participate in the interviews, ultimately, twelve actually completed this aspect of the study. *Figure 3.2.2a, 3.2.2b and 3.2.2c* (above) demonstrate the geo-location and teaching experience of the participants. Pseudonyms were given to all participants in order to maintain the integrity of the ethics parameters under which this study was conducted – see *Figure 3.2.2d*.

Years Teaching	Geo-location	Gender	Pseudonym
10+	Australasia/Asia Pacific	Male	Stefano
10+	Australasia/Asia Pacific	Female	Willow
10+	Australasia/Asia Pacific	Male	Hugh
10+	Australasia/Asia Pacific	Female	Lana
10+	Australasia/Asia Pacific	Male	Geoffrey
10+	North America	Male	David
10+	North America	Female	Nadine
6-10	Australasia/Asia Pacific	Male	Joseph
6-10	Europe	Male	Geoffrey
6-10	North America	Male	Rohan
1-3	Australasia/Asia Pacific	Female	April
1-3	Australasia/Asia Pacific	Male	Antonio

Figure: 3.2.2d Pseudonyms and general information about interview participants

The majority of interviews were conducted using Jotform as an asynchronous, online resource (7 of the total 12), two participants opted for a face-to-face (online) interview using Skype, one face to face, one responded with text using email, and one participant accessed the questions using Jotform and responded by audio recording directly on their laptop and emailing their responses. The reasons given by those who preferred not to use the Jotform platform included, unfamiliarity with the required online resource, limited bandwidth or a preference for a personal interview. The responses from the face to face interviews tended to take somewhat longer and contain more content than some of those submitted online, as the session was more "chat-like' and not time pressured. Some disadvantages with the online interviews included participants being unsure as to how long they could record their responses and perhaps cutting the discussion short. Using Jotform I was not able to prompt participants to continue if they stopped after a short time, or to clarify aspects of the discussion, which may have impacted on the length and depth of narrative. The advantage to the participant in the face-to-face interviews was that they could talk as long as they felt appropriate (guided by body language and other feedback cues) and were able to ask clarifying questions if required. The disadvantages of the face-to-face interviews included time allocation, location and the interviewer having to be more conscious of body language and feedback that could influence responses.

Scaffolded, but somewhat unstructured questions were utilised for these interviews as pre-determined, highly structured questions may leave little room for the participant to improvise or exercise independent judgement (Attwater & Hase, 2004). Unstructured interviews align more closely with GT and may afford greater access into the participant's perspective. In this study, the questions used for the interviews were established directly from the data generated through the second online survey, with opportunity for the respondent to interpret and reflect without strict guidelines. The disadvantage to the participant was that they were not able to ask for clarification - a frequently experienced complexity when using interview as a technique, is the issue of "text" or question interpretation, which is subjective and relies on the experiences and understanding of the recipient, thereby possibly affecting the response constructed.

In this study, visual metaphor was used as a technique for the interviews, to initiate the participant's responses about their own practice (appendix D) encouraging them to connect with the topic from a personal perspective and to describe this connection. Metaphor is a figure of speech, where the representation of one thing in terms of another is symbolic. Methods using visual or image based metaphors, rely on the participant connecting to an image eliciting a personal connection with an experience or phenomenon and describing this relationship through the image. This approach is referred to as the Zaltman Metaphor Elicitation Technique (ZMET) and requires participants to choose visual images that represent their feelings on an issue and bring these to an interview. It is often used in marketing research by companies attempting to define and qualify consumers' thoughts and feelings about products and constructs (Zaltman & Coulter, 1994), and is used in educational research projects as a stimulus for connecting the interviewee with an experience – to start their reflection of personal narrative without guided

questions. The visual metaphors were selected for the interview process of this study (Appendix D) by asking a range of my colleagues and family members to send an image they "liked" – with no linked context or direct connection to the research study. No attempt was made to predetermine a connection with education, teaching practice or other experiences of participants. The images were selected so the participant was not really choosing, but rather [hopefully] being drawn to one image with which there was a natural connection on a personal level. The aim, successfully achieved in the study, was to find a connection with one image that encouraged the participant to talk about themselves – tell their story – and to become comfortable with the ongoing interview, rather than viewing the process as a series of questions requiring answers. Participants accessed the images by either viewing them directly within the Jotform online interview resource (see Appendix C), or by clicking on the link provided to view the images directly in iCloud as a slide show or individual images as preferred by each respondent.

3.3 Timeline – the research process

The research study on the characteristics of agile teachers commenced with an initial pilot survey. The purpose of this was to determine the collective understanding of "agile characteristics" of teaching practitioners from a broad group of educators. A survey with questions enabling multiple selections and personal contributions reflecting practice was devised and distributed via Survey Monkey to a purposeful, select group. The response rate was reasonable (27) and whilst there appeared to be a lot of "data" it became quickly apparent that the format of the survey would not provide adequate "analysable" data for the study. The questions were, overall, too closed and pre-determined – not reflecting grounded theory philosophies. From the pilot responses, the most frequently selected characteristics of "agile" practitioners were used to create a word bank that would be used as a starting point for open responses in the newly developed survey for the study.

The second survey (Appendix B) was more difficult to develop as greater care had to be taken to avoid channeling and directing responses - and to ensure greater openness to a range of possibilities from participants. This survey was also created using Survey Monkey, piloted with a small group and then distributed openly using snowball sampling and virtual social snowball sampling techniques. Responses were collected over a period of 2 months, allowing for continual distribution during that time, using a wide range of social networks in order to generate sufficient responses.

Following the surveys, respondents who elected to participate further in the interviews were contacted either directly (if requested), and a time for the interview selected, or they were directed to the online interview resource (Jotform), or clicked straight through to the interview online resource from the survey. This meant that most completed the interview almost immediately after the survey whilst interest in the research study was high. Interviews took place over an eight week period – most utilising Jotform as an asynchronous, online resource. Interviews that were face to

face took a little longer, as meetings had to be set up at a time at a location of convenience. This included the interviews conducted using Skype – location not being an issue, but time management and bandwidth demanding some considerations.

3.4 Data analysis methods

3.4.1 – Survey

As noted above, two surveys were created for this research study. The first survey (Appendix A) was designed with the anticipation that data generated would be useful in developing an understanding of agile characteristics. However, after collating responses, I was able to see that the information gathered did not fulfill this promise, to some extent due to the question design. Whilst questions were qualitative in nature, due to the way they were presented in the survey, the data generated was more quantitative and hence closed, which was not the aim of the study. The general information gathered, however, was used as a guide for developing more open-ended, qualitative questions for the [second] survey that would be the main data collection instrument for the study. The data generated by the first survey were also useful in that they enabled me to ascertain that the participants who had been sent the survey, many of whom were in my direct professional network were in general, reflective, collaborative, adaptable and implementing new teaching strategies in their classrooms.

In the second survey (Appendix B), for a time I found it difficult to adhere to a Grounded Theory approach whilst trying to develop questions which would allow for open, reflective responses from participants. Self-reflecting on the “errors” of the questions and data generated in the first survey, I used this learning to re-shape the questions for the second survey. Eventually most questions provided opportunity for the respondent to reflect on their own practice or on observations of the characteristics or practices of other teachers – this meant that a wide range of educators could respond, (including final year pre-service teachers), not restricting responses to those who already considered themselves “agile”. A total of 79 responses were submitted over a period of several weeks – when initial replies (60) slowed, to increase data generation for analysis, I added the survey to several new social media sites which generated further interest.

Glaser and Strauss (1967, 1987) argue for the importance of combining the collection of data with analysis where possible. As responses to the survey were submitted in a relatively spread out timeframe, I was able to begin the process of reviewing and analysing the data - coding, categorising and making comparisons relatively easily, developing notes that showed relationships between responses as well as frequency of comments, words etc. Again, GT was the right paradigm within which to conduct data analysis, as this research study was looking for something “new” and trying to avoid looking for something “specific”. This process accorded with

the view that data should be collected through an inductive process ensuring that, as much as is possible, only the voice of the participant is heard (Glaser, 1998). Using GT and choosing not to use methodologies that included components such as pre-coding for analysis, I was able to maintain and justify the integrity of the data analysis and emergence of theory.

I permitted the survey to continue circulating throughout social networks until "saturation" occurred, i.e., when no new data resulted from additional data collection. As saturation is an essential element of GT, all data are valid for inclusion in the study until there appear to be no new data being generated. I would reflect however, that with the current status of survey saturation as a global research issue, the data collection possibilities might also have become saturated at this time. I am unsure as to whether or not targeted surveys or a re-introduction of the survey through social networks after a "break" of a number of weeks may have resulted in renewed interest and response.

3.4.2 – Interview

The interviews in this study were designed to elicit the stories of those participants who felt, after completing the survey (#2) that they were "agile" in their practice. In all, twelve participants were interviewed – either online or face-to-face. Each set of recorded responses was fully transcribed and held on a secure, external hard-drive. Participants were provided a copy of the recording and transcript to assure authenticity of the text being used for coding and further analysis. All participants were provided with pseudonyms to ensure identity security.

Data from interviews were coded, categorised and "memoed" with analysis running continuously alongside. In GT there are several significant components that must be included throughout the study and analysis – sampling procedures, coding procedures, memoing, constant comparison and writing (Martin & Gynnild, 2011). The interviews contained discourse from the participants reflecting practice, perspectives and tangible experiences – all elements were included in coding and analysis.

Categorising and coding for the survey and interviews were done manually initially, after which I trialed a free web based tool, *Saturate,* developed by Dr Sillito from the University of Calgary, Canada. At some point, I lost track of this resource and seemed unable to relocate it or recall relevant information that would enable me to continue using it and so I began using a trial version of the online software resource, "*Nvivo*". This resource appeared extremely useful, but not as user friendly as *Saturate. Nvivo* did not "come naturally" to me as a working tool for coding. Whilst hand coding may have been easier and faster, I felt that in the long run, having the categories, codes and data electronically available would be advantageous. I was eventually able to relocate the resource, *Saturate* and my "notebooks" (cached online) and thereby decided to complete the analysis and coding of the research findings using this tool. A video tutorial for using *Saturate* was located on the internet and can be located in Appendix E.

Electronic storage of large amounts of data and the ability to manipulate or sort the information is much more achievable when digitally available. The software also has “memoing” tools that enable the researcher to annotate and draw from the data as theories emerge. The use of electronic software for categorising and coding also assisted in maintaining rigour by allowing quick, accurate searches of large amounts of text. As a means of cross-referencing, all text was also manually searched, as the software cannot search for nuances and alternative ways of expressing experiences or responses.

3.5 Limitations of the study

In this study, some of the normally expected limitations when using survey and interview may have been averted, through the use of online survey development and distributions and (primarily) online, self-managed interviews. These include:

Survey:

- cost of development (printing and postage)
- labour-intensity (distribution and collation)
- finding participant addresses or locations for distribution
- Collection and return of surveys

Interviews:

- Time consuming for both respondent and interviewer
- Difficult to schedule times that are mutually convenient
- Travel costs for participant and interviewer
- Possible bias or interjection from interviewer affecting integrity of responses

Nevertheless, whilst the methodology and procedures undertaken in this study avoided some of the more “traditional” limitations indicated above, there were factors that impacted on the overall process and data collection:

Survey

Combining snowball sampling and the use of virtual social networks, there was no way of measuring overall response rate of the surveys. The researcher can only gauge interest by the number of responses but when responses were slow, it was difficult to know where to “re-target” –

or if any particular social network had been more successful than another - as with all snowball sampling methods.

The disadvantages of using social networks for distributing surveys, include the researcher having no way of measuring degrees of access to the survey, and whether decisions regarding non participation are through lack of interest, time or other factors. Social networks are also saturated with individuals requesting survey responses, feedback and discussion participation which may impact on interest. Saturation of general information on social networks also means that for many potential participants they did not see the request for survey participation, as it was "lost" amongst a high volume of "feeds". For a request or question to be "in the right place at the right time" could prove challenging and this situation could limit the number of responses simply through chance.

Interviews

The interviews in this study may have been limited by the participants' technical competence and/or confidence. As access was primarily online, comfort with using the technologies required may have reduced the number of replies received and impacted on the length of discussions. At least one participant, despite what I considered to be sound instructions, was not able to work out the process and ultimately emailed a word document with responses to the questions – "*I chose the gloved hands…but when I clicked on the image it didn't work..."*

Bandwidth available to participants may also have limited the length and quality of responses. As recordings consumed a reasonable amount of bandwidth and took a significant time to "save" if bandwidth was low, this may have meant that some respondents did not complete their interview.

Recording responses may have also been limited by the fact that respondents might have wanted to "not make mistakes" in their discussions or narrations. Although the directions clearly stated that if the participant made a mistake they should just keep recording, there appeared to be few occasions where that happened. I can only surmise that participants were either very confident in their replies, re-recorded responses or wrote notes before recording.

Self-selection for interview participants could be considered both a strength and limitation of the study. On the one hand, it allowed the definition of agility to be fully grounded, coming from the understandings that the teachers had of themselves and their practices. Allowing for self-identification enabled authentic selection for interviews with no bias or personalisation from the researcher. On the other hand, some individuals self-identified as agile who did not seem to fully meet the criteria arising from the survey when analysing their responses to questions. The responses of two participants, identified as Hugh and Lana, could be considered "outliers" in that they appeared to have their own agenda at times, not always addressing the question as such and indicating a lack of connection with the concept of agile characteristics and practices.

Misinterpretation of questions by respondents, with no means of clarification was another limitation for the online interviews. If a participant misinterpreted the meaning of the question this

could impact on the nature and direction of all responses, as there could be no prompting or clarification from the interviewer. For example, one participant, Lana, completely misinterpreted the meaning of "*agile*" and discussed physical attributes of the teacher they were describing as opposed to the characteristics of practice "*agile implies physically active… the woman next door to me, terms one and two this year was obese, didn't leave her desk much but due to the class climate and inquiry teaching mode she had actively pursued and developed with her class, I would definitely classify her as a teacher you are looking for"***.** This same participant thought that this research was more about the use of technology: "*Your research is about technology. Could you possibly use a term that incorporates or suggests this focus"?* Prompting or redirecting the participant was not possible as the respondent was completing their interview online.

Considering all advantages and limitations for this study, in spite of some of the issues experienced, the advantages of distributing, completing and collecting responses for both surveys and interviews using online resources, outweighed the disadvantages. The ease of creation, global distribution, ability to connect with a wide range of teachers from many sectors and networks added a strong foundation to the validity and rigour of research. The technologies available "value added" to the research experience, enabling a redesign of traditional survey and interview approaches enabling participants to connect with the study who might otherwise be restricted by distance and time. In this way, they could asynchronously share their perspective and narrate professional experiences, thus adding dimension and authenticity in a way that might otherwise not be possible. Conversely, the "risk" and limitation of this approach was that there was no way to authenticate who was answering the survey, nor to ensure that they actually were teachers.

3.6 Conclusion

This chapter discussed the methodologies and processes used to address the major focus of this research study, identifying the characteristics of the agile teacher, considering *why,* rather than *how* they "do what they do" as they adapt, reshape and respond to the changing needs of students and the learning environment. Using a process of qualitative investigation, with an infrastructure of grounded theory and narrative inquiry, the study surveyed and interviewed practitioners globally in an endeavour to identify the characteristics of an agile practitioner, using social media to connect with broad networks of educators. New media and online resources were utilised to connect with, survey and interview participants, and to gather and analyse data. The chapter explored limitations of the study, not only through time restrictions, but furthermore, as a result of some of the methods of data generation applied. In Chapter 4*, Presentation of Findings*, the data will be explored, considering the alignment and conflict that may have presented in both survey and interview responses. As data of significance emerged, this shaped the theory being

constructed, enabling identification of the characteristics of the agile teacher and a deeper understanding of these characteristics in practice.

Chapter 4 – Presentation of findings

This chapter provides a detailed account of the findings from the three empirical data collection phases – initial/pilot survey (1), major survey (2) and interviews. Accordingly, this chapter is structured into three parts: the first part discusses findings from the pilot study, the second part focuses on the analysis of the findings from the online survey and the third, the in-depth interviews from self-selected participants.

The study sought to understand characteristics of agile teachers, and then to use these emergent understandings to examiner agile teacher practices. Essentially, the key area of research was to uncover these characteristics, and then consider from the agile teacher's perspective what the drivers and facilitators might be that influence their agile practice. The research included an investigation of the relationship between such practices and existing, new and emerging educational technologies. The questions used to guide the study are repeated below:

a. *What are the identifying characteristics of agile teachers*
b. *How do agile teachers respond to the use of emerging technologies?*

Sub Questions

- Who are the "agile" teachers?
- Why do "agile" teachers teach the way they do?
- What are the barriers and facilitators that impact on agile teachers?
- Are "agile" teachers "great" teachers – and "great" teachers "agile"?
- Do technologies impact on how "agile" teachers teach?

In this chapter I will show how Grounded Theory codes, memos and visual demonstrations of ideas, provided an insight into how the final categories were developed. The primary categories and codes that became evident during analysis of survey 2 and interviews are displayed in *Figure 4.0* below. These categories will be further discussed and unpacked in this chapter.

Agile	Barriers	Learning	Practice	Technology
adaptability allow change different interesting perceptions personal reflective characteristic divergent	frustration preparation curriculum time disappointment fear colleagues conflict burnout personal careful unsure cautious	ongoing new reflective curiosity adaptable continuous sustainable embedded dissatisfied disconnected personal restrictive purposeful ownership quality	demonstration new strategies sustainable successful risk-taking reflective spontaneous fear challenging alternative change contrast quality	embrace learning supporting sustainable cutting edge spontaneous irresistible

Figure 4.0 Primary categories and codes from data analysis

4.1 Findings from survey 1

Initially, a pilot survey (Appendix A) was developed to investigate potential interest in the focus of the research study, which was to identify the characteristics of agile teachers. Using feedback from the pilot survey and recognising that questions needed to be more open-ended, a second survey (Survey 2) was created (Appendix B). As previously mentioned in Chapter 3, the pilot survey identified those characteristics that participants selected from a list of possible characteristics and behaviours provided with no option to add personal choices. As data were generated, it quickly became apparent that whilst there was significant interest in the study, the format of the survey would not provide the grounded theory approach authenticity that was desired in the study. Nevertheless, indicators of preferences for specific characteristics was an indicator of popularity for these descriptors. Overall, the findings were interesting in that they indicated that teachers were interested in the proposed study and that there was a somewhat emerging concept of what an agile teacher might look like (see Q 10 and Q 11, Appendix A)

The pilot survey did help to identify some interesting factors and characteristics that were most commonly selected by participants. These characteristics of agile practice included continual

learning and connecting with peers through networks that are either personal or virtual, a view that professional learning was important and positive attitudes towards the use of and early uptake of technology. The focus on practice also emerged from the pilot survey as a commonly selected characteristic that would identify an agile teacher and demonstrate "difference" from a non-agile teacher. This data would guide the development of questions around practice and professional learning.

The changes from specific questions with selected responses in the pilot survey to open-ended questions with guiding examples in survey 2 can be reviewed in section 4.2.3 – 4.2.5. Further details can be found in appendix A and appendix B.

4.2 Findings from survey 2

The second survey, as previously discussed was designed as a response to the data and shortcomings of survey 1. In survey 1, participants were provided with a range of descriptors and questions from which to select preferences, but there was no opportunity provided for personal reflections or inclusions. This meant that whilst there were charts produced that indicated some interesting choices, the survey lacked personalised responses and did not support the integrity of grounded theory which requires open-ended questions to allow perspective and to provide for the emergence of ideas and theories.

In the development of the second survey, questions were designed to enable participants to respond authentically and without specific direction. The responses from the second survey encouraged richer expressions of perspective regarding agile teacher characteristics, enabling some foundational concepts to emerge (see Section 4.2.1), which underpinned the questions that would be asked in the interview phase.

The findings in survey 2 provided a wide range of data that required more significant coding and analysis. Using the online resource, *saturate* (See appendix E), I was able to create codes and categories for terminology, ideas and perspectives that were repeating elements of responses, and to identify those descriptors or reflection points that appeared to be outside this range. Overall, the themes that emerged were quickly obvious, with the main categories of descriptors of identifying characteristics; practice; attitudes towards professional learning and attitudes towards the use of technologies displaying prominence.

4.2.1 Agile characteristics identified

Figure 4.2 shows the distribution of respondents to survey 2 in terms of geographic location, years of teaching experience and gender distribution. *Figure 4.2.1a* demonstrates a wide spread of geographical representation, which supports the premise that respondents come from a wide range of educational perspectives. *Figure 4.2.1b* demonstrates that respondents come from a

diverse selection of teaching experiences, including pre-service teachers who have yet to graduate or practise as qualified teachers. *Figure 4..12c* indicates the even distribution of gender amongst respondents. The fact that there was a gender balance is interesting as predominately on a global scale, there are more female than male teachers in schools (See Appendix J). We could speculate that male teachers are more likely to answer an online survey, however, studies focusing on this phenomena (Smith, 2008), record that females respond at higher rates than males. Additional studies considering online survey participation via mobile devices (Bosnjak, Poggio, Becker, Funke, Wachenfeld, & Fischer, 2013) do indicate a higher proportion of male participation than female. It is also possible that the pattern of response is attributed to a higher number of men seeing themselves as agile teachers, but this was not a focus of the research undertaken. However, it may be a worthwhile follow-up to this study. Another interesting factor that was not determined by the survey was the number of years teaching in a particular location – this could have been interesting data as it may have been noteworthy for the study to determine if agile teachers stay in one school for a long period or move frequently. This could be considered in a future study of agile teaching practices.

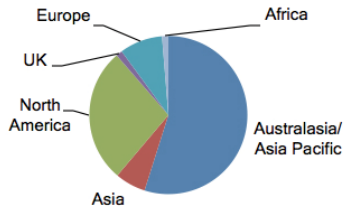


Figure. 4.2.1a – Geographic distribution of respondents for Survey

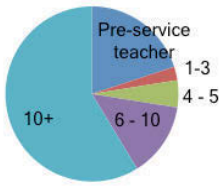


Figure. 4.2.1b – Years of teaching experience for survey respondents

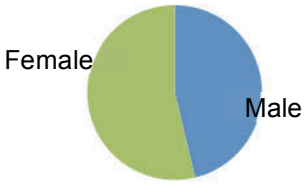


Figure. 4.2.1c – Gender distribution of survey respondents

4.2.2 – Describing agile characteristics

A word cloud was created from survey 2 responses, (Figure 4.2.2a) identifying around forty key words that were used by participants to describe agile teaching characteristics, with *adaptable, reflective, intuitive, creative, flexible* and *imaginative* being the most frequently contributed. Word clouds are frequently used to represent qualitative data as they provide a visual demonstration of size, number or frequency without the use of more traditional graphical representation. Ramsden and Bate (2008) describe the use of word clouds as an additional tool for survey response analysis as they provide "a visual depiction of the responses within a minute" (p.2). The use of word clouds enables a quick visual analysis of data to be generated, highlighting key findings or

information, which may be of use in directing more detailed analysis later in the research study, for example, during the categorising and coding stage of data analysis (McNaught & Lam, 2010).

The descriptors of agile teacher characteristics identified in the survey were then used in the interview phase to gain initial feedback from participants regarding reflections on their own agile practice. Participants discussed their connections with the existing descriptors and then elaborated through discussion, adding new descriptors to the original list provided. In the word cloud below (Figure 4.2.2a), the frequency of words contributed in each phase is demonstrated by the size of the word displayed - the larger the word, the more frequently contributed by participants. For the purpose of this survey, any words that were contributed less than three times were not used for the word cloud image.

Figure 4.2.2a – Word Cloud - Survey identified "agile" teacher characteristics

This word cloud can also be demonstrated in a chart of frequency as shown in Figure 4.2.2a1

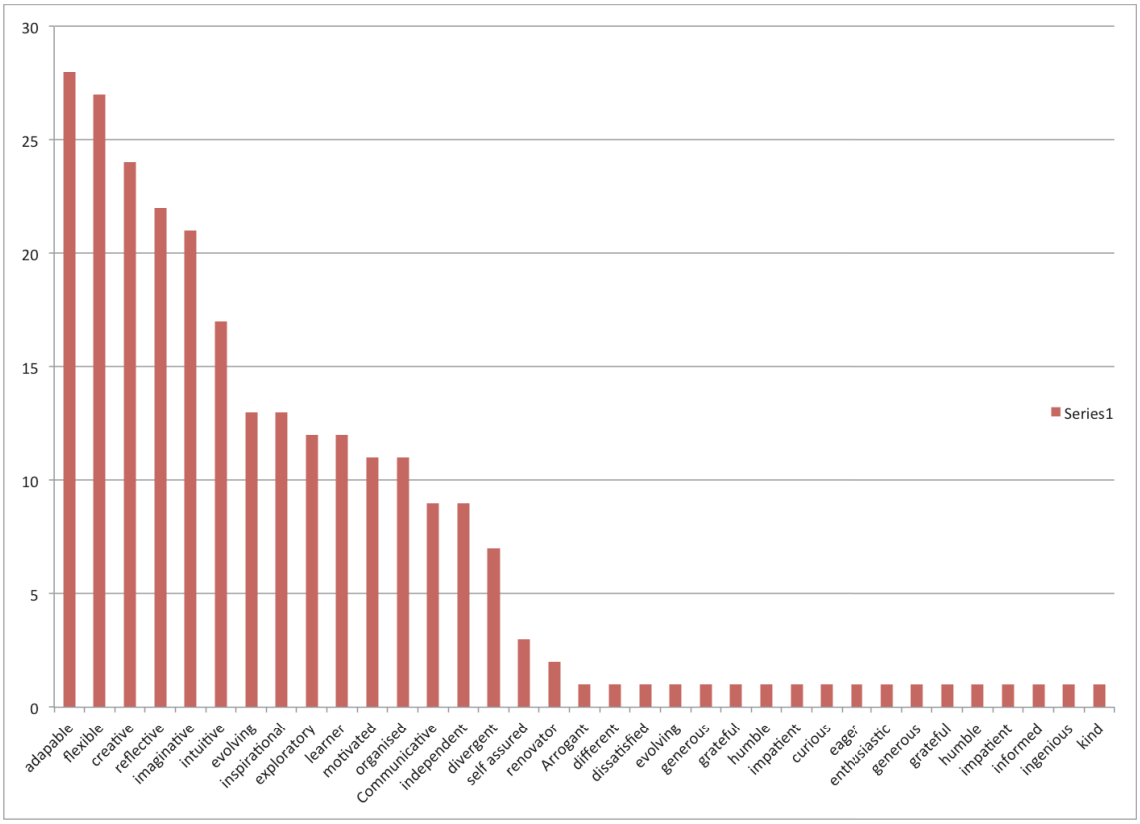


Figure 4.2.2b – Table of frequency - Survey identified "agile" teacher characteristics

It would seem that from the perspective of respondent teachers (who may or may not themselves be "agile" teachers), the view of the agile teacher is, overall, one that is very positive. From the viewpoint of peers, agile teachers appear to be primarily seen as interesting, exploratory, imaginative, creative, motivated and adaptable. Along with being reflective, intuitive and responsive, it could be inferred that colleagues generally see them as practitioners who demonstrate interesting characteristics to which other classroom teachers might aspire. Many of these descriptors are also reflected in research about "good" or "great" teachers (Gose, 2012); therefore, it is likely that from the perspective of other teachers, good/great and "agile" teachers exhibit similar characteristics See *Figure. 4.2.2c* for characteristics of good teachers, as noted on a website for teachers. A frequency chart is also provided to review a graphical representation of these descriptors (Figure 4.2.2d)

The notion of agile and good (or great) teachers will be discussed in a later section of this chapter.

Figure 4.2.2c – "Good" teacher characteristics – word cloud

Adapted from: http://www.bchmsg.yolasite.com/a-good-teacher.php

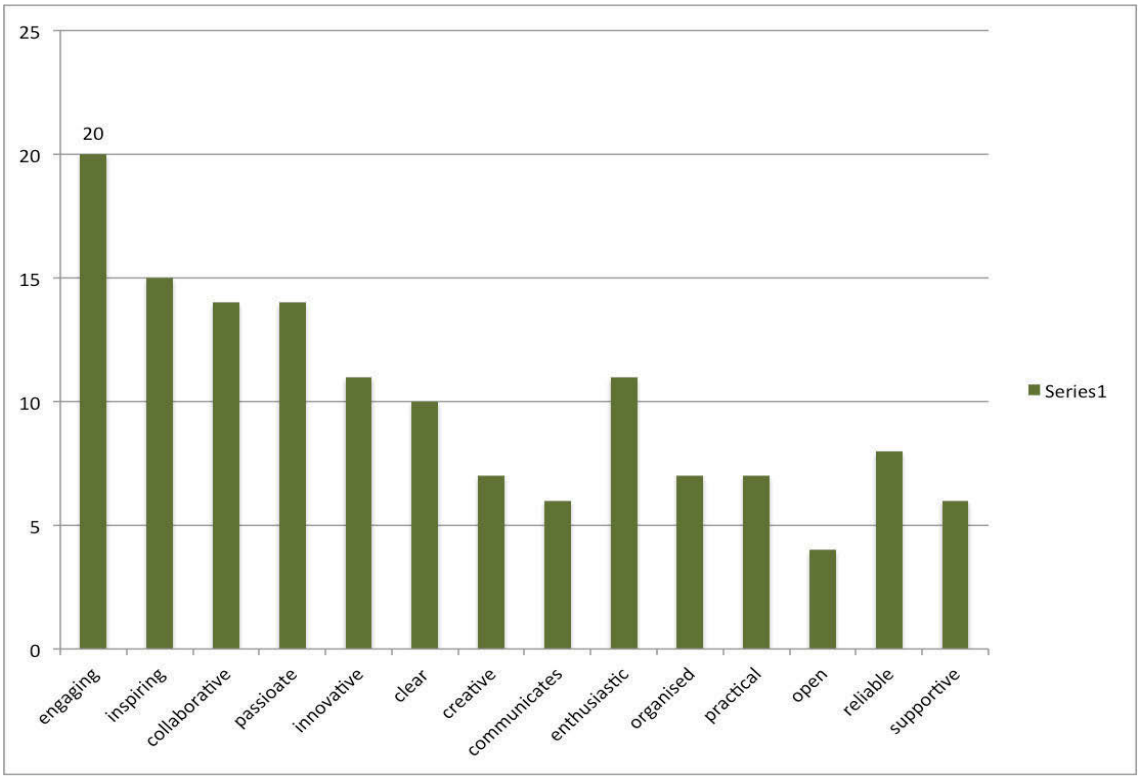


Figure 4.2.2d – Good teacher characteristics, frequency chart

4.2.3 – Practice

In addition to the descriptors provided in responses, survey 2 participants were asked to reflect on observable teaching practices or behaviours that they considered agile teachers enact. The themes in the second survey that emerged focused largely on factors regarding: connecting with students, trust between teachers and students/ teachers and teachers, being organised and being reflective – and demonstrating action from reflections. Personal attributes such as being inspirational, adaptable and a person who seems to be "okay" with all the changes happening in education, were also identified as characteristics that agile teachers possessed. During analysis and coding of the generated data, similarities between comments, frequently used terminology and attitudinal concepts were used identify popular themes and terms. Contributions included:

- *can think outside the box and is unpredictable*
- *able to adapt to any situations in the classroom and learn from that situation*
- *the person who is aware of what is taking place in the classroom and how the students are learning/understanding*
- *more focused on learning than curricular compliance*
- *generate creative evidence of student work*
- *differences seen each time you observe them because they teach in different ways when it suits the occasion*
- *agile teachers can inspire others and share ideas*
- *reflects in action and upon action*
- *is willing to change*
- *busy meeting the diverse needs of student interests and abilities in their class*
- *has good plans – and has a good plan "B"*
- *reflects to enhance or refine practice with a willingness to adapt*
- *do not view themselves as the "font of all knowledge"*
- *effect learning rather than direct it*
- *allow participation from students*
- *believes in and exhibits lifelong learning behaviours*
- *trust their students*

These reflections of observable practices relate to characteristics such as adaptability, preparation, belief in the learner, awareness of student individualities, reflective practice and awareness of authentic learning. None of the statements reflect characteristics that suggest

entertainment, fun or chaos; it appears that overall, the agile teacher is seen to be well prepared and focused on deep learning through their adaptability to changing paradigms and student needs, is focused on relationships and inspires other teachers. It could be concluded from these statements that agile teachers are recognised by their colleagues as pedagogically adaptive, knowing how to change learning activities and parameters as necessary to suit the needs of their students.

4.2.4 - Professional Learning

As noted previously, continual learning, connecting with peers through networks and professional learning were areas most commonly nominated in survey one responses, indicating the characteristics of the agile teacher. Respondents to the second survey where open-ended questions about how the agile teacher might perceive and respond to professional learning identified the following factors. These factors arose during analysis where coding enabled the grouping of similar perspectives, the emergence of frequent classifying words and the indication of a range of attitudes that were considered to be demonstrated by an agile teacher.

- *keeping an eye on literature and social media*
- *joining lots of forums or professional platforms/groups*
- *asking lots of questions*
- *challenging the status quo*
- *seeks out current research – with a critical eye*
- *being able to throw creative 'grenades" yet stay away from hyped up or evangelical ideas/conferences*
- *seeks out learning opportunities*
- *keeps an eye on the education landscape and changes practice to reflect learner needs*
- *participates in their own research*
- *doesn't wait to have professional learning organised for them*
- *often don't like watching a talking head "webinar"*
- *knows that a [school based] in-service is not usually effective professional learning*
- *observes other innovative teachers and model practices*
- *speak to their students and adapt as required*
- *lots of - "but why" and "how"*
- *looks for opportunities to add to pedagogical knowledge*

- *Is self-aware and asks questions to clarify thinking*

It would appear from these statements in survey responses, that the agile teacher has a preference for professional learning rather than professional development, ie., they do not require nor like to have another person or system determine the learning they require for professional growth. Overall, it seems that they are considered self-directed and driven to learn for themselves, seeking opportunities for professional improvement using a range of sources including professional networks, literature, peers and students. Others see the agile teacher as preferring interactive and relational professional learning – where they have an opportunity to observe and align with others who affirm and inspire. Reflective practices and communicating with students is also seen as professional growth and they prefer such practices to having to rely on external and/or organised workshops, conferences or seminars. The statements about professional learning from the survey also indicate that although perceived to be inspirational and somewhat evangelical, interestingly, peers also see the agile teacher as one who is able to discern usefulness and avoid the "hype" of evangelistic professional messaging. Whilst they are known for their leadership styles and practices and are seen to be front-runners in innovation, agile teachers seems less affected by the propaganda of catchy strategies, promises and ideas, until they have interacted more intimately with these concepts and made their own decisions about purpose. Whilst appreciating peer networks and support from other sources, agile teachers seem to be very much self-directed and determined regarding choices they make for professional learning.

4.2.5 – Technology

The study sought to determine the impact of existing and emerging technologies on the agile teacher. The reason for this stemmed from a general interest as part of the study to determine the influence of technologies on the practices and characteristics of agile teachers. Survey respondents discussed the connection between agile teachers and technologies and noted that most agile teachers were users of technology and frequently early adopters of emerging technologies. Significantly, the most important factors discussed were the connections and interplay between agile practice and "good" teaching/learning using educational technologies.

- *an agile teacher knows how to use technology*
- *critically chooses varieties of technologies*
- *is open to new forms of incorporating technology*
- *will only use technology if it offers improvement*
- *experiments with emergent technologies*
- *finds alternative uses for traditional technologies*

- *uses technology as a tool not an answer*
- *does not automatically assume that technology delivers a better solution*
- *is ready to exploit the educational opportunities of technology*
- *uses technology to enrich pedagogy*
- *enables students to take risks with technologies*

Agile teachers are seen by their peers to be adept at and interested in existing and emerging technologies. Statements by respondents indicate that whilst they embrace and experiment with technology, agile teachers are considered as deliberate in their use of technologies in learning. They are also seen to use technologies as a resource for learning possibilities, not as a driver of pedagogy. Reflections in the survey on experimental and risk-taking interactions with technology, replicate some of the general characteristics and practices of the agile teacher observed by their colleagues, as discussed in previous sections.

4.3 Findings from interviews

As previously discussed (Chapter 3), interview participants self-selected for the research study, after responding to the questions in the second survey. Respondents who had completed the second survey had constructed an image of an agile teacher's characteristics. Whilst not specifically stated, it was implied that further participation in the study would indicate self - identification as an agile teacher. The initial survey preamble included: *The purpose of this study is to grapple with understanding the teacher who is adaptable to change, is flexible and able to "seize the day" or teachable moment. For the purpose of this study, these teachers will be referred to as "Agile" teachers. This survey, intends to understand what agile teacher characteristics could be, and is part of a larger study: Embracing Innovation – a study of agile teaching characteristics and the use of emerging technologies*. Questions that followed focused on the participant openly reflecting on the characteristics and behaviours that they felt would be practiced by and observable in an "agile" teacher. The question asking for participation in the next phase of the study simply stated: *If you would be interested in participating in the interviews for this study, please either select this link to record your responses online http://form.jotform.co/form/50069097858872 OR complete the form below and I will contact you to arrange a time for a face-to-face or Skype interview.* As indicated in Chapter 3, it is quite possible that some respondents dropped out of the interview phase only when they realised that the questions were focused on their experiences as agile teachers.

In the interview phase of the study, participants were those who felt that their description of these characteristics aligned with their perception of their own characteristics. The interviews provided

an opportunity to reflect on themselves as such a teacher. The grounded nature of this study did not allow for a definition of agile teacher characteristics to be offered by the researcher. This definition arose from the respondents' understandings on completion of the survey, and might well have varied from one respondent to another. The limitation of this approach therefore, was that some who elected to participate might not have been "agile" or might have considered themselves to be agile according to an idiosyncratic understanding of agility that they possessed. This possibility was further evaluated and identified during the analysis of the data generated, with outliers being considered in the discussion but disregarded in analysis aimed at gaining deeper understanding of the research questions.

The majority of respondents (7 from 12) elected to complete the interview process using the online resource, Jotform (Appendix C). Of these, all except one were able to complete the interview online, recording audio responses using the questions provided as a guide for beginning their discussion. The one individual, who was not able to use the resource, responded to the questions in text form, emailing a document with the responses. Several others elected not to use the online resource, preferring to be interviewed face to face, or by using the questions as a guide and writing responses in an email or recording audio responses using mobile recording apps such as *soundcloud* (online audio recording resource).

Excerpts of responses from individual participants are used throughout the research discussion to demonstrate themes and patterns that have emerged from the interviews. In keeping with a grounded theory approach, all responses have been considered, using data generated from participants to support the emerging ideas and categories. All direct responses are identified in *italics* throughout the following discussion. Where relevant, the name (pseudonym) of the respondent is included. At times, compilations of responses that provide a general reflection of discussions from the agile interviewees are presented.

4.3.1 – Visual metaphor reflections

Visual metaphor, as previously discussed in Chapter 3, was used to initiate discussion and to engage the interviewee in reflective responses. This aspect of the interview was scaffolded through narrative inquiry, ensuring the voice of the participant was the primary focus and that their story was the underlying driver in the conversation. The concept of metaphor as a means of recollection and driver of discussion worked particularly well for the interviews in this study as it initiated personal reflection and storytelling, thus connecting the interviewee with their passions and interests. In each instance, the interviewee chose an image to which they related in the context of being an agile teacher – either as a direct reflection of their own experience or metaphorically, in that the image invoked a connection with their professional and/or personal narrative. The participant used the image as a reference or springboard for their discussion.

The unfolding narrative enabled the participant to create a personal connection with the interview, creating a foundation from which they would be able to respond to the remainder of the questions. Interestingly there was considerable overlap of images chosen by the interviewees, with several choosing the same image, whilst presenting a personalised narrative on each occasion. This overlap reflected the possible connections of thought, yet still allowed a range of perspectives and experiences to be brought to the study. Excerpts that follow are from the participants' responses to visual metaphors (Figure. 4.3.1a). The full range of twenty images used in the visual metaphor stimulus can be reviewed in Appendix D.

I choose [this] image as to me it represents a great change over time… you've go explosive change that an agile teacher can make in the moment, seizing what's going on and chasing that down. You've also got the kind of change, which happens slowly over time… So I guess it shows the change and the difficulty in the pathways that we're wading through – and certainly the nature of the journey as well (Antony)

I chose the man walking down the road. It was a real plain background and sharp contrast to the road. Reminds me a lot of teaching and thinkin about we all have different paths that we take – multiple ways to get to the same location. We arrive at the same location hopefully through multiple routes – and our students do as well. We have to be able to arrive at the proper location and at the same point (David).

I think the image I related to was number 5 – often when you're moving i a particular direction, you have an end goal in mind…but something comes up which is important – and when that does come up, when you grab someone's attention when they become involved in a lesson and want to explore a tangent – it's important to go off on that tangent. You can always come back to where you were and where you wanted to go. Once a child has their attention grabbed that's a precious moment and you should take advantage of that (Stefano).

I chose the iceberg image – there's a few things - one the idea that education only touches the surface of people's potential - it can clarify th big picture though (the glass) but only the person themselves can raise the glass, shake things up, and drink. An agile teacher would encourage students to find what lies beneath - to learn how to learn for themselves, to be active - pick up [the] glass…shake it (Nathan)

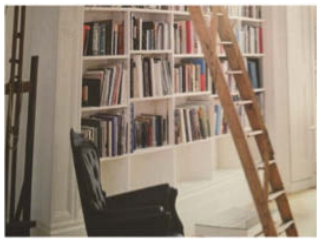
I selected [this] image because there is more below the surface to me as an agile teacher - you are not necessarily who you are on the surface bu that you are really delving more deeply than that. There's more to being an agile practice teacher than we can learn… it's not just about the information or the knowledge but about what that actually means, how it can be practised, thought out, enacted and support further learning (Joseph).

I've chosen [this] image because it has lots of both depth, which I think depth in a range of ways is important as an agile teacher – but it's also within that controlled environment of that class or whatever it is. I particularly like it because I think what that says about agility as a teache or for anyone really, is that no matter where we are, we are in a controlled environment whether it's a school, or whatever it happens to be (Willow).

I chose the pictures of the footprints in the sand [because] I believe learning happens everywhere, or anywhere and we need to be able to deliver the instruction so that it's convenient for the student. There's kind of a deeper meaning for me in the sand and the ocean shore – I love the ocean…my house is located so that I can hear the big waves crashing to the shore here. It's my source for inspiration, but it's also my place to go and calm down when needed (Nadine).

I chose the gloved hands… it represents collaboration and valuing difference in education…we are moving towards individualised learning and valuing student voice- both facilitated through integrating ICT in education (Lana)

The image that resonates most with me is the water with the lily pads sitting on the top and then the lotus blooming out of the water. I think for me it represents the large body of knowledge that you need to have as a teacher…the lily pads are the techniques you draw on for each particular moment, maybe just in your current working memory – from your huge body of knowledge you just draw on a few ideas at a time - and work on a few theories and put them into place to ensure that students can learn…to ensure that flower blossoms (Maria).



It's all about knowledge, it's all about learning – books open doors and I believe in having as many doors open to my approaches as I possibly can, because I know that in the group that I've got, there are so many differences between individuals…being able to meet all these individual differences is what matters (Hugh)

Figure 4.3.1a Summary of responses for visual metaphor stimulus

Further to these descriptions, two of the interview contributors, Rohan and Geoffrey did not submit a response for the visual metaphor question; therefore no data were available for these participants from the stimulus. This issue (that is, non-response) is reflective of the limitations discussed in the previous chapter, that is, when using asynchronous online interview resources, there is often no process for the researcher to redirect or follow up with the interviewee if required.

The discussions from the visual metaphor stimulus enabled me to catch a glimpse of the authentic agile practitioner, unconstrained by having to answer specific questions. As the interviewees spoke about their connections to the images, it was interesting to listen to the narrative that wove meaning into their experiences, describing the complexity with how they think about learning. These responses were, overall, reflected throughout the remainder of the interview, although at times, there appeared to be some disconnect between the personalised response (visual metaphor) and the "answer" being formulated in response to a specific question in the interview. This issue is revisited later in the next chapter.

4.3.2 – Agile reflections and connections

Interview participants were asked to reflect on the word cloud that had been created using the most frequent words identified by survey respondents to describe the characteristics they believed best identified practices and behaviours demonstrated by "agile" teachers. Each participant

selected those words that resonated most strongly with their “picture” of an agile teacher, and with their own “agile” practices, contributing additional words if desired.

As interviews were collated and coded, a new word cloud was created to reflect those adjectives from the survey word cloud that were most frequently identified and discussed by the interviewees. The most frequently discussed words included adaptable, exploratory, resilient, reflective, creative, flexible, intuitive, exploratory and intuitive. As demonstrated in the image below, (understanding the significance of the relative size of words in a word cloud indicating frequency of use), a greater number of descriptors appeared to hold equal significance for interview respondents than demonstrated through the survey, with additional emphasis on observable characteristics such as evolving and exploratory practices. From the interviews there was also a new focus (as compared to survey responses) on subjective characteristics such as being pragmatic and self-assured. These frequencies are demonstrated in Figures 4.3.1a and 4.3.1b

Figure 4.3.1a – Interview “agile” teacher characteristics reflected

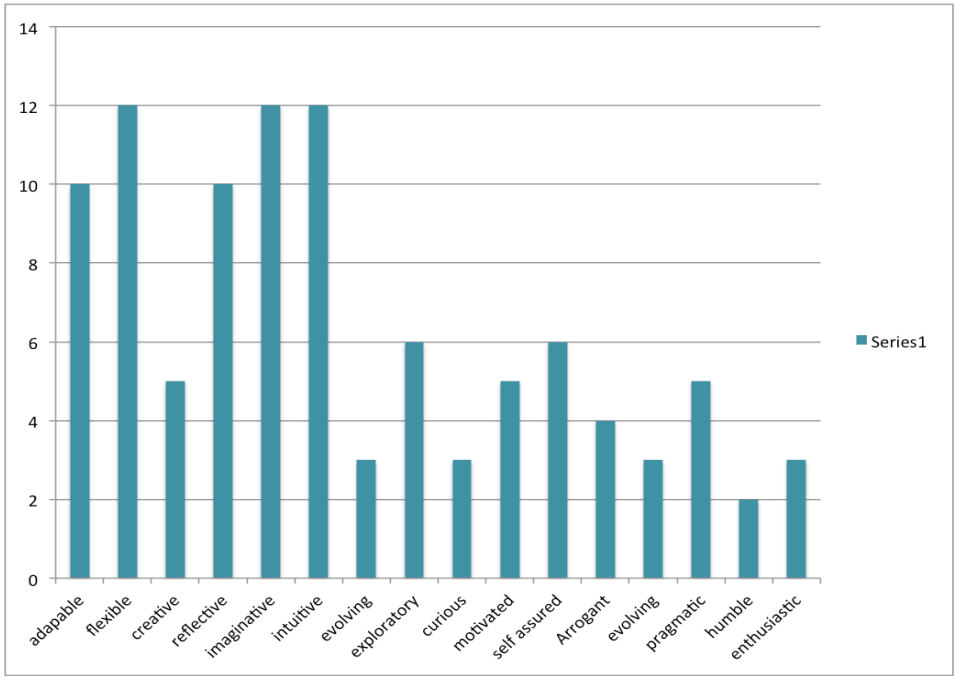


Figure 4.3.1b – Interview "agile" teacher characteristics reflected

Of interest are new descriptors added by the interview participants (Figure 4.3.1c) such as maverick – identifying the need to be independently minded and at times a little "unorthodox" whilst still understanding the need to comply with curriculum requirements, policies and course outlines. On the other hand, these requirements were also discussed as potential and recognised inhibitors to "agile" practices (see Figure 4.3.6)

Figure 4.3.1c – Interview participant - additional "agile" teacher characteristics identified

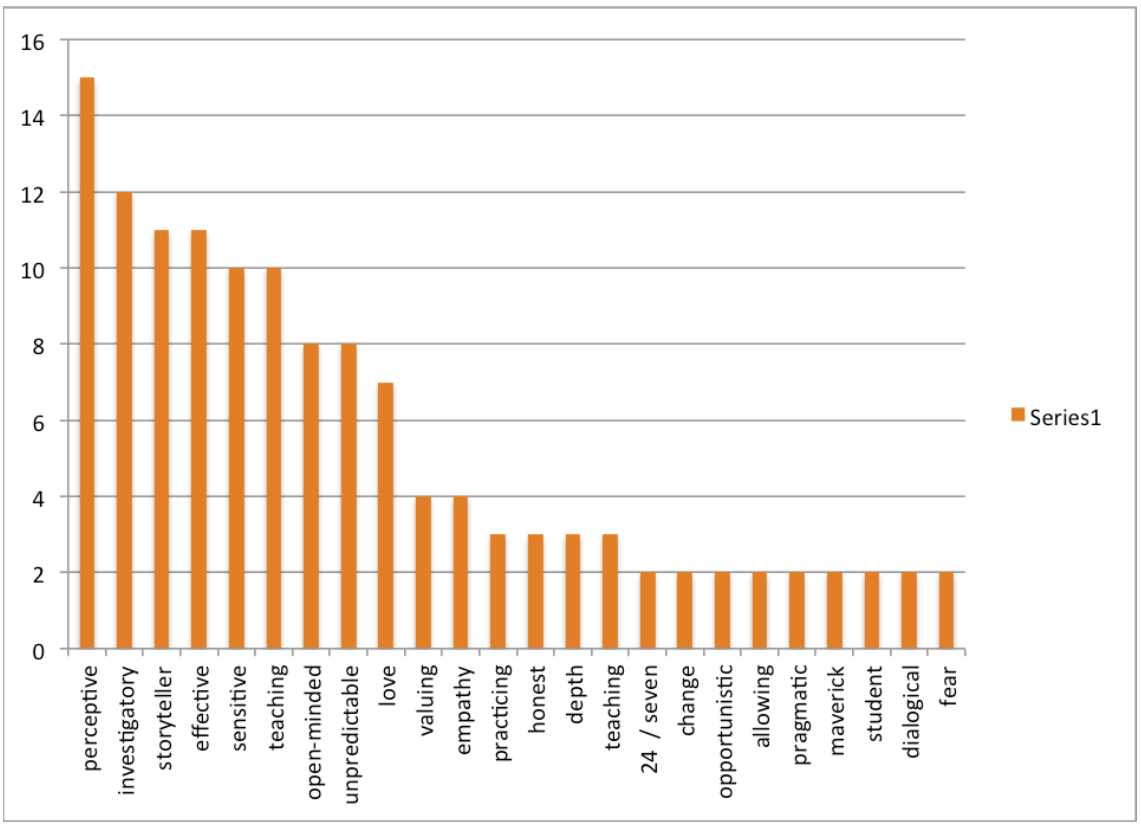


Figure 4.3.1d – Interview participant - additional "agile" teacher characteristics identified

Discussions by participants aligned the need (as an agile teacher) to be open-minded, perceptive, unpredictable, independent and "out there" with being self-assured/self-confident (even perhaps at times appearing arrogant). The agile teacher is strong enough to hold fast and believe in persevering with less traditional ways of approaching learning, trusting their different approaches will lead to better outcome for the students in their classrooms. The ensuing remarks are a collective, representing the majority of views of interview participants about self-confidence as a characteristic of agile teachers:

…confidence in yourself as a person; confidence in your ability to change because that's needed…I think they're important things to consider. I've always thought of confidence, competency and collaboration as being something you need to go through… If you are not self-confident as an agile practice teacher it's very hard to be responsive and intuitive - and be able to determine how you are going to manage things if they do go awry. I like the word humble, and next to arrogant, if I said I was proud of my humility that would probably tell you how arrogant I

can be. I like to be responsive to people's needs. I try to be pragmatic because things have to work – but balance the degree of idealism.

At the same time many agile teachers reflected a sense of dissatisfaction – often with themselves, reflecting the need to always improve and learn how to do things "better" and differently in order to best satisfy the learning needs of all students. This sense of dissatisfaction or having never "arrived" at perfection in teaching is a common thread in all responses. As practitioners, agile teachers are very reflective, considering each lesson a learning opportunity for themselves, searching always for different ways to present content, skills and learning activities in order to "improve" their teaching and student learning. The following comments from Rohan, David, Maria and Nadine reflect the general consensus of opinion from the participant group as a whole:

You always have to be dissatisfied with where you are if you're going to improve – and we should always be trying to improve…because if you're standing still you're going backwards… Most people have doubts about their own abilities – in my case I would hope that I'd continue to improve…so I'm not happy where I'm "at", I'm always wanting to be better and there are certainly aspects of my teaching where I can continue to learn, where I continue to improve and hopefully it's those doubts or hesitancies that help you to strive to be better and become a more agile teacher.

The concept of dissatisfaction seems to be also connected to feelings of restriction – often imposed from a peer or leadership perspective, but also from the curriculum and school policies that place "barriers" around the capacity to be agile. The need for resilience to "barriers" would seem to be one of the primary issues most respondents have to deal with on a daily basis.

…the system that we presently have isn't as supportive in actuality of agile teachers…as it is in theory. I think in theory we all welcome it and we all say "yes, we need agile teachers, and we need innovation and we need to push that as much as we can" but the reality is that most teachers and schools don't have the capacity or understanding to accommodate this… you need to work with that resilience and push yourself…just go beyond all of that (Antony).

Participants aligned agile practice to flexibility and evolutionary behaviours - being able to "teach" lessons using alternative and creative approaches, responding to changes in class behaviours, learning needs and student interest. Reflections focused on how, as an agile teacher, they instinctively think on their feet, respond in an improvisatory way to unpredictable actions, questions or behaviours by students - effectively changing the course of a lesson or considering new ways of presenting information and demonstrating understanding. Individual and collective responses demonstrated an understanding of the need to be more than just "flexible" regarding student learning, but also having ability to improvise, be evolutionary and embrace change in their own practices as well – staying ahead of where most educators are "at" in their current practices. The following compilation is a "mash up" of comments made by Geoffrey, Joseph, Willow and Rohan and reflects views of all the group:

I have changed and I continue to change depending on what's happening…You have to be flexible because things never work out the way they're supposed to – but sometimes that's a good thing…it's often how we learn… You have to be evolving, because [as said previously] *if you're standing still you're going backwards…I try to think so that I'm one or two steps ahead of the mainstream view of education. I try to make myself informed by being open to new knowledge and having a good knowledge of what's happening in the world around me – you try to make things relevant by doing that. I think agile practice enables us to adapt and take on a different role rather than necessarily just taking on a singular role*.

Interestingly, except for one individual, respondents did not refer directly to *motivation* as being a factor driving agile practice – that is, they did not actually say the word "motivation" when asked about factors that inspire or drive their agile practices. It may be that motivation as a concept, is intrinsic in agile teachers and they do not feel the need to identify it as such. They did, however, discuss engaging students in the process of learning; seeing themselves as a conduit between the students as learners and the content came up consistently as an additional characteristic of agile practice. Similarly, inspiring passion, inquiry and curiosity from teacher to student was frequently mentioned. The agile teacher talks about a kind of "magic" that is demonstrated through excitement and enthusiasm, driven by curiosity and investigatory characteristics, and an authentic love of the students they are teaching.

You can't be agile if you're not curious about everything that's happening around you…you've got to love the kids you're teaching and want to do all you can to help them (Nadine). Students' agency in their own learning is so important that we cannot afford to ignore it any more. It's easy for me to guide it towards the direction where I need it to go and to ask the deeper, probing questions…and then let the students bring in their expertise (David).

The teacher is not entertaining the students, but rather connecting with them, providing opportunities to learn differently, *sometimes letting students fail* (Willow, Joseph and Nadine), supporting them in their journey of discovery and encouraging them to develop skills such as *intrinsic motivation, hard work and self control* (Joseph). Letting students fail is, in itself, not seen as a failure of learning, but rather used as a means from which students learn to reflect, adjust and adapt from the experience. In this context, failure is not a grade, but rather seen as a way of identifying new approaches to the learning process.

Respondents to the interviews also focused on how as agile teachers they consider themselves as good storytellers and see the value this skill has in teaching and learning. Nadine directly referred to the need to be *dialogical* as an integral part of being agile, with other responses reflecting the value of dialogue and intellectual content, experienced in a non-rigid environment; where diversity is encouraged and promotes deep understanding and a personal connection to learning.

I know where I'm going and I know how to get there. I am never going to preclude any method from what I am doing, so in being agile, I'm keeping up to date with what I think learning can be and I constantly explore beyond the syllabus, beyond the text book and I'm a terrific believer in storytelling (Hugh).

It would seem, from the general group of responses that the agile teacher is a "connector", a storyteller and a weaver of dialogue that considers the diversity of needs of the range of students in the class, encouraging inquiry and deep personal understanding.

4.3.4 – Technology and the Agile teacher

The majority of participants have a deep understanding of the way in which digital technologies can add to inquiry and knowledge in increasingly differentiated ways. Most describe their interest in digital technologies as high, with a passion for investigating new, emerging technologies. Overall, the use of digital technology is integral to the way they "do" things, in their teaching and in other aspects of life. On the whole, most respondents see technology as a facilitator of practice and they seem to see its use as being influenced by whom they are as practitioners. They see technology as a "virtual" double-edged sword, but not necessarily the factor that *makes* them agile. Participants noted that technology provides greater levels of innovation, accessibility, communication, teaching and learning, liberating the ways in which inquiry, discovery and dissemination of information can be made possible. At the same time, they commented on how technology continues to change the way in which teachers and students access information, crossing thresholds of ownership and censorship, changing at a pace that is increasingly exponential, creating hitherto unforeseen issues that include social, ethical and legal [possible] complications in learning. The agile teacher whilst sometimes feeling overstimulated by the technologies generally appears to manage the way in which they design learning experiences to encompass technology-enhanced learning.

I don't think it's just about the fact that technology has impacted the way I teach "or" does my teaching impact on the technologies...I think it's both (Willow). I think an agile teacher, if you like, has this "radar" where they are continually scoping out what's happening in the environment – in education, in the wider world, in the technology world – everywhere around them, to actually get the best thing that they need (Antony). The teaching impacts on the technologies that you use and the technologies impact on your teaching – the two have to be interconnected (Maria).

Agile teachers often use digital technologies as an extension of their practice – but they are also very aware of how technology itself does not create agile practice or "good" learning. Rather, they see the technology as having great possibilities but these factors are the drivers and the technology is the facilitator.

I think it's not actually my teaching that impacts on the technologies I choose, but it's actually my framework – my theoretical framework – that mostly impacts the technology I choose to bring into the classroom, or I choose to share with my students (Joseph).

For the agile teacher, technologies can also present obstacles to learning, for example the inadequacy of certain apps, the lack of technical support and frustration at inaccessibility to desired technologies (in their particular school), often driven by policies or leadership restricting technology access. For some, the constant requirement to find "work around" solutions or to fight battles to be able to use digital technologies beyond the computer laboratory, with the whole class or beyond narrowly specified parameters, is a deterrent and has a direct impact on their ability to be effectively agile.

I am constantly frustrated by our accessibility to technology at the moment, the only tech we have at the moment consistently available is the smart board, which doesn't even run the latest software so what you can do is highly limited. I think that being on the cutting edge of technology constantly makes it harder 'cause you are then trying to work around bugs and imperfections. It's not something I always have time to do and that causes me a lot of stress (Antony).

Agile teachers are wary of others seeing the use of technology as a benchmark of "good" practice and reflect that just having students immersed in technology will not necessarily result in the development of understanding and knowledge. They are aware of how much money is being spent on specific technologies such as Interactive Whiteboards and tablets without always having the desired effect of expanding or improving student learning.

…using technology in a real meaningful way in the classroom - I don't think it's happening yet…I think that technology is misconstrued in its use in the classroom quite specifically (Antony). It's important to use the technology well – I don't believe in using technology for the sake of it. So whatever technology is used should be adding to the learning experience (Joseph).

Overall, the agile teacher sees technology as invaluable in extending learning experiences. They see technology as inextricably connected with pedagogical purpose and something most could not imagine teaching without. However, technology was not seen necessarily as a deal breaker for agile practice.

I don't know if technology is necessarily the thing that makes a teacher more agile. I think their ability to use it is important, but I don't think it has to be used to make you an agile teacher. The agile teacher is an early adopter, not just of technology, but also of ideas. They use technology to make lessons better i.e. they do not automatically assume that technology delivers a better solution (Willow).

It would seem, from the responses provided that the agile teacher is adept with and excited by digital technologies, and that whilst not driven nor contained by its availability or capacity, they are

able to use technology, adapt it and shape it to meet the needs they have at a higher level of teaching and learning.

4.3.5 – Demonstration of agile practice

The stories told by participants reflected on why they do what they do, and demonstrated agile practices in teaching and learning situations (Samples located in Appendix F). Agile teachers do not always see what they do as different or amazing – it is just what they do. So for some, the discussion around demonstration of agile practice was a challenge initially. This seemed to underpin a theme emerging throughout the interviews – that agile teachers are teaching in a way that is a natural response and is not something they are specifically aware of doing. This will be discussed further later in this chapter.

As participants discussed their teaching experiences, their excitement became evident: the stories were woven with comments such as "*it was awesome"* and "*oh yeah, there was the cicada last week…*" and summarised by statements like *"so we just took an opportunity to explore something that came up. There's always this sort of opportunity."* Reflections focused on how things would just "come up"; they would often throw out planned lessons, preferring to run with what had come up at the time that seemed more relevant or worth pursuing. This reflected the previous comments by the teachers regarding the ability to think on their feet, and be open-minded and opportunistic in their practice when they felt it would benefit or interest students. This concept was clearly stated in the following quotation:

Well almost every lesson I could say demonstrates this. I think the reality is I don't really tightly plan my lessons because I like to see what is going to be happening on the day. I mean if there is something interesting that is happening during the week, or I can take a piece of learning that I have done myself or some reading or something that might respond to a particular problem that a student has, that to me is more appropriate than overly worrying about it. I have a scaffold and know the concepts I need to teach… I can re-shape that however I need to at the time… (Joseph)

Agile teachers appear to seamlessly change what they are doing, respond to the needs of students and be constantly finding opportunities to bring authentic learning experiences to the students they teach. This exploratory and investigatory behaviour occurs across a range of situations, not confined to the classroom or the time of the lesson. Agile teachers are always on the lookout for opportunities and resources, and are not constrained by the specified "purpose" of the resource which they often adapt to redefine pedagogy and learning experiences.

Just last weekend I went rock climbing and abseiling and during that I realised very early on was friction in order to control that descent. I became very excited by this because we'd been teaching the children, friction, gravity, forces and matter…I couldn't get friction out of my head so I figured

the only thing to do here was to capitalise on the opportunity and to make a video… So I carried my camera with me and rigged up a GoPro (video camera) to the front of me. Then I cut it all together into this fantastic video - it was a real spur of the moment thing that I couldn't help but do. I would have been so mad at myself if I didn't do it. It wasn't an option to not make that video... (Antony).

4.3.6 – Non-agile practices

Surprisingly some participants reflected that factors such as policies or curriculum requirements constrain their agile practice. It seems interesting that a teacher who can be so flexible, creative and divergent, feels they have to teach some subjects or content in a non-agile way. Making the curriculum less rigid and more interesting, and being concerned with the need to address student individuality are characteristics of agile practice. However, the curriculum may, interestingly, also be a major restraint to agility for at least some agile teachers. A compilation of responses reflecting these sentiments include:

"W*e're forced to follow a very rigid curriculum… children get restless, very frustrated and we get frustrated as well by being prohibited from being agile in these scenarios"* and "*In meeting syllabus requirements, sometimes you're forced to do things in a regimented way – out of the necessity of meeting the legislated requirements. Sometimes the curriculum itself prevents you from adopting the best ways of doing things – to meet the requirements you are forced to meet."*

Heads of department and other leadership constraints were also acknowledged as inhibitors to agile practice "…*sometimes the practices that don't make me look agile are things like having to have strict procedures and protocols around things and having my head of department say 'I want you to do x,y and z when you are teaching'" (Joseph).* Discussions raised issues such as learning not to be open about "agile" approaches or practices to leadership. Once an idea has been tabled, if considered too radical or "out there", the agile teacher is often told not to go ahead. This poses the dilemmas of defiance or compliance, both of which cause conflict for the teacher. Other teachers in the same stage or year group will often complain that this teacher is "really weird" or "hard to work with" and complain to leadership who will often require the agile teacher to "tone down". Might this be aligned to the "tall poppy" syndrome evident in many educational institutions, where often "different" is not seen for its value but rather as being non-compliant or having contempt for the curriculum standards? Regardless of potential issues and restrictions, most agile teachers will often find a way to still do the things they know are going to make a difference. It is their tenacity and belief in what they are doing that continues to drive their practices.

Additional factors such as being time poor for a range of reasons such as, additional school duties, personal responsibilities and social engagements, were highlighted as barriers to agile practice. Nevertheless, being "agile" perhaps also enabled them to create a lesson "on the fly"

when they were not fully prepared, although some felt that the quality of the lesson was affected when this happened. So perhaps, the characteristics of the agile teacher include not just the ability to think quickly, to create a lesson that "works" but also that they critique the quality of their practice quite severely, reflecting quickly on what could have been done to improve the lesson or activity. Conversely, as demonstrated by Antony below, agility may lead to over-commitment and time management issues that in turn may impact on preparedness for class. The agility of the practitioner may lead to pursuing a large number of ideas, spending precious time on discovery and exploration, resulting in rushing at the last minute for the class they are about to teach.

At times, I'm under-prepared for lessons – this is a time factor…I suppose, however, I'm quite agile in how I'm able to prepare for those lessons on the fly and adjusting things as I need to - although I don't think the quality of the lessons or teaching is there in those underprepared lessons, so I wouldn't count that as agile – mostly that's a time management thing…When I don't feel I'm at my best is mainly to do with institutional requirements and lack of time to prepare enough to be fully agile (Antony).

The need to do paperwork, keep records of student learning and facilitate standardised testing also appears to inhibit agile practices. Traditional testing at a school, state and national level causes some anxiety for agile teachers, as these tests often don't provide the platform for all students to authentically demonstrate their understanding and knowledge. This is another dilemma that these agile teachers have to grapple with as well as resisting the demands to prepare students for these tests. Of interest, but beyond the scope of this study would be to establish if the dichotomy between authentic learning and the need to assist students to do well in standardised testing is a wide-spread issue amongst agile teachers and if there are practitioners who approach this dilemma in a more "agile" manner.

…"*they [tests] cater for having a very definite end result of learning, and that's not agile. I mean, learning, by nature, it's open-ended. And yes, we can have standards, but those are just standards, and students should be able to go above and beyond with my help*" *(Nadine).*

Physical spaces and overcrowded classrooms are additional factors that impact on agile teaching practices. Small classrooms with outdated, non-moveable furniture, inappropriate classroom allocation (English classes in a science lab for example) and sharing spaces with a number of other teachers inhibit how the space can be used. On the other hand, this is often seen as a challenge, inspiring greater levels of creativity and ingenuity, with some interviewees seeing physical space as a driver of difference rather than a barrier. A collection of comments made by participants includes: *"Sometimes I feel like the Pied Piper of Hamlin, as we search for different places to have our class,"* and *"I move the teacher's desk away to the side every lesson and it's right back there the next time I come in…we just see setting up the classroom as part of what we do at the beginning of each lesson – there's no one way we do it…it depends on what we're doing that lesson."*

One respondent, Lana, discussed how at times, in spite of agile practices, differentiated approaches and alternative ways of approaching learning, some students will still not engage or connect as a consequence of overriding psychological factors. The students referred to were 12-13 year olds with depression and they did not respond at all to any learning opportunities presented…*"This made me doubt my ability to engage students at times and to question my teaching capacity"* (Lana). The reflections indicate that agile teachers may have a heightened sense of self-awareness, which may lead to self-doubt at times. This is discussed further in 4.3.8 where the participants discuss doubts and hesitancies in referring to themselves as agile teachers.

4.3.7 – Relationships between agile and "great" teachers?

Throughout this study, the concept of "great" teachers has been considered as a possible alignment or adjunct to the definition and recognition of the agile teacher. Previous studies have explored the concept of "great" as a defining descriptor of what makes a "best practice" teacher (Refer to Chapter 2). The concept of greatness in teachers appears, in the literature reviewed, to embody all that is seen to be desirable in a teacher – one who engages students, has students who learn (and achieve good grades), is likeable, may be a little unorthodox at times and has the respect of peers – refer to Figure 4.2.1 (Gose, 2012). From the interviews, it would seem that agile teachers, on the whole, believe that you cannot be a "great" teacher without being agile, and that in order to be a great teacher *"you need to be responsive to the needs of students, you have to be able to change direction to take advantage of the opportunities that arise…ie be an agile teacher" (Nadine).*

Conversely, agile teachers do not necessarily believe that by being agile, they are *always* great teachers. They see themselves as continuously evolving, striving to create "better" lessons, to connect more with the students they are teaching and to finding ways to improve. This does not necessarily make them feel they are "great" at all times. Once more, the perception of being on a journey is foremost in their reflections, whereas their understanding of the term "great" when referring to teaching includes the notion of having arrived at the destination and therefore, not requiring ongoing adjustments or adaptations. Their "agility" implies sustained learning and improvement.

Even though I consider myself to be an agile teacher, I certainly wouldn't see myself as a great teacher. I'm a teacher that tries very hard… but I think being a great teacher takes a lot more practice. I don't think there's any way that anyone can be… maybe I'm giving the word "great" too much importance… but I don't think there's any way anyone can be a truly "magnificent" teacher – to take the word "great" a little bit further, without years and years of practice. And not just practice… without years and years of experience and really getting to know the content – and exploring ways of teaching (Antony).

Respondents identified connections between agile and great, but also acknowledged that there are many ways of interpreting both agile and great – and that the two are not necessarily synonymous, nor always identified the same way by all teachers or the general population. They noted the correlation between great teachers and agility in practice, but also suggested that in addition to relating to interactions with students, agility might at times also relate more directly to (and be affected by) the content, curriculum requirements or to other extraneous factors. Two interviewees also reflected on how this concept of changing and adapting (i.e., agile) might not always equate to being effective (i.e., a *great* teacher).

Being agile doesn't necessarily mean that you are a great teacher though because I guess it's all relative to students – just because you're changing and adapting, it doesn't mean you're doing a good job… are you agile towards the needs and circumstances of your students or just the content? (Rohan).

Several of the respondents had a different perspective to the majority and referred to teachers they would consider as "great" teachers – but who might not be considered agile at all. Nadine's thoughts about this included "…*there are teachers out there who have such a firm grasp of what they are teaching, know the ins and outs of their subjects in such detail that they've got their lessons down to a fine art. I think these teachers don't necessarily have to be agile and adaptive teachers because what they're doing is already fantastic."* And from Willow "*… I have seen infants' teachers who are great teachers because of their structure – but I wouldn't class them as being "agile". They're not flexible – they go through things because that's the way it's always been done. But they're "great" teachers."*

Lana also commented on knowing a teacher who was great but would not be considered agile according to her understanding of the agile practitioner. Lana's response to this question included "…*the woman next door to me this year…didn't leave her desk much, but due to the class climate and inquiry teaching mode she had actively pursued and developed with her class, I would definitely classify her as a great teacher."*

Overall, the majority of responses from participants supported the connection between great and agile, determining that to be truly "great" you would have to be agile in your ability to adapt, be creative, imaginative and responsive to the needs of the students. Again, this may come down to the subjectivity of defining a great teacher as discussed earlier in this chapter and the literature review.

If we define a great teacher as someone who is in the absolute upper echelons of the profession, who is super responsive to student needs, gets good results for the students, is well liked and respected by the students… I don't think you can be a great teacher without being agile (Joseph). You have to be responsive to the needs of the students, you have to be able to change direction to take advantage of the opportunities that arise (Stefano)… I just can't see that you could be a great teacher without being creative, imaginative, flexible and responsive (Nathan).

Disregarding testing as a measurement of success, it seems that overall, agile teachers are divided in feeling there is a definite connection between great teaching and agile practices, recognising that "*just because you're changing and adapting, it doesn't mean you're doing a good job. And just because you're "great" at what you're teaching, it doesn't mean that you're capable of adapting on the fly and responding to the needs of the students as they occur" (Antony).* It would appear that identifying "agile" practitioners and connecting the concept of agile and great, could be as fraught as identifying "great" itself. "*I think agile is a pathway to being great – but it depends on what your definition of "great" is…" (Maria).*

Nevertheless, emerging from the responses, is an understanding that to be a truly "great" teacher, you have to be agile in the way you approach learning "… *because it is the responsibility of the practitioner to adapt the knowledge they have to the needs of each individual. There is no substitute for really knowing who the person that you're working with so that you can enable them to really be the best they can be" (Hugh).* Overwhelmingly, the respondents supported the notion that greatness is something that intersects agility, and that whilst seemingly difficult to specify or determine exactly, the two terms whilst not necessarily interchangeable, are inextricably connected.

4.3.8 – Doubts or hesitancies (about calling yourself an agile teacher)

This section of the study offered an interesting mix of responses from participants. Surprisingly, some indicated that whilst they were comfortable in self-identifying as agile teachers, they would hesitate to say this to a colleague or peer. This was an interesting response as reflecting on the second survey responses, it would appear that their peers readily identify most agile teachers and they, themselves, self-identify with ease. They exhibit confidence in their practices, in not always conforming to traditional approaches and in being somewhat noncompliant to structures and restrictions. The hesitancy, however, appears to stem not from lack of confidence, but rather from the reflective and continually evolving characteristics of the agile practitioner. They connected their hesitancy in identifying as an agile teacher with perceived inadequacies. Willow's comments support this consensus…*I have doubts because it's hard to look from outside of myself then think – is that who I am or is that who I perceive myself to be.*

One participant, Nathan, commented on the reason he would not describe himself as being an agile teacher, aligned more with the fact that the term is not one with which others are familiar… *No [I wouldn't hesitate to call myself an agile teacher] - except from the perspective that others may have no idea what it means (Nathan).* This was interesting as although the term "agile" has not been used to describe the characteristics of teachers previously, it would seem that it would not require a great deal of explanation and might be more comfortable than identifying publicly with being a "great" teacher.

Overall however, the interviewees for this study reflected that they are comfortable with the notion of being an agile teacher, tying their acceptance of the "label" with a growing understanding of the nature of agile practice. The characteristics are recognisable and identifiable, with Joseph's and David's comments echoing those of the majority "… *[it's easier] to categorise someone else as an agile teacher rather than categorizing myself… but [I question if] my practices always fit into the agile model"* (Joseph) and *"I think [seeing myself as] agile is a good thing it just presents you as somebody who is able to make changes and allow change…"* (David).

The majority of responses from participants to this question, indicate that although reflective in their practice, they are confident in acknowledging their agility as teachers, recognising their personal limitations and understanding that these characteristics are continuously evolving. The characteristics of the agile teacher appear to be personally recognisable as wanting to make continuous change, adapting to student and curriculum needs as required and always having room for further growth. Interviewees also reflected this position as they discussed their attitude towards professional learning, explored in the following section.

4.3.9 – Professional learning

Professional learning, its connection with and effect upon agile characteristics and practice was also explored in this study. The results echoed the responses made in the survey, indicating that overall, whilst the agile teacher seeks new learning, often they do not respond positively to professional development (PD) that is decided upon or directed by another entity. They see school designated "Professional Learning" as manufactured or contrived, and describe a general disconnect with, and unwillingness to participate in, this style of development.

This position regarding professional learning was also reflected in the surveys where the majority of participants commented on how the agile teacher would seek their own learning and often be reluctant to participate in school-organised professional development days. In general, as demonstrated by Nadine, who stated "*learning is something you do for life…it's the most natural thing for humans to do… I constantly change the way I view learning and teaching",* the interviewees saw professional evolution as a continuation and interplay between all other aspects of what they "do" with little demarcation between daily inquiry and seeking more formal professional learning.

Interestingly, two of the agile teachers who responded to this study, Maria and Antony, felt that although they know what they want and like to source their own professional learning, that the constraints of long teaching hours, the "system" and limited access to learning opportunities had an impact: Both teachers had less than five years' experience in teaching, which may or may not have been an impacting factor. Studies in this area may determine if the number of years teaching

has an impact on how teachers feel about the confines of time management, the “system” and maintaining professional learning/development and the impact of this on the agile teacher.

Maria reflected:

I think my agility as a teacher is constrained sometimes through the system – through the amount of teaching hours I’m in the classroom and access to professional learning. There [are] lots of essential things that I wish I could be learning but it’s constrained through funding and access to professional learning.

This viewpoint was contradicted by other interviewees with a greater number of years’ teaching experience, who discussed not so much being constrained by the lack of professional learning opportunities provided, but rather by the style of activities demanded by their school.

4.4 Conclusion

In summary, it would appear from the data generated through surveys and interviews, that the characteristics of the agile teacher are the embodiment of a range of relationships between the practitioner, their environment, the students with whom they interact, responses to the curriculum and the technologies available. The characteristics of adaptability, resilience, inquisitiveness, curiosity and perseverance appear (from survey and interview responses) to set these practitioners apart from their counterparts, affecting how they approach challenges, respond to structural restrictions, adapt to student needs and undertake a personalised approach to continued learning. These characteristics were acknowledged by participants as significant descriptors and were indicated in the development of the word clouds used to visually represent the frequency of descriptors (See Figure 4.2.1a; 4.2.1b; 4.3.1a; 4.3.1b) The descriptors emerged through inductive data analysis, becoming clear during the identification of codes and categories whilst analysing data generated. GT was used for this analysis as the research was investigating phenomena not previously identified. Whilst there are common themes of characteristics and thoughts, there is appears to be no one specific pattern to the manifestation of practice for the agile teacher – their agility of practice adapts to the circumstances in which they are placed on a daily basis. This flexibility underpins the characteristics of the agile teacher, enabling them to redesign learning opportunities as required, relying on the confidence with which they see themselves (generally) as practitioners.

Agile teachers see themselves as key to the learning environment, primarily as providers of opportunities, challenge, dialogue and connections with students, adapting to change readily and purposefully, governed by intuition, experience and responsive practices. Personal professional growth, continued learning, interest in new ideas, technologies and strategies are embraced by

the agile practitioner who feels compelled to build and seek networks of peers, inspiration and tutelage regardless of extraneous factors.

Chapter 5 – Discussion and Conclusion

The purpose of this study was to examine the characteristics of “agile” teachers – those teachers who “seize the day”, finding the “teachable moment” at any opportunity. The study explored what the concept of agility meant to teachers and considered facilitators, barriers and the relationship between emerging or available technologies and agile characteristics and practices. Research was conducted through online surveys, using social media to distribute the questions globally to possible respondents. Follow-up interviews were conducted with self-selecting participants who responded to the invitation for interviews at the conclusion of the survey. This chapter reviews the findings, considers the major themes that have emerged from the data and explores how these align with previous literature in related areas. It also examines the way in which agile teacher characteristics influence practice and concludes with suggestions for additional or further research.

The questions that framed the research were:

a. *What are the identifying characteristics of teachers who are agile, adaptive and responsive to change;*
b. *How do agile teachers respond to the use of emerging technologies?*

Sub Questions

- What are the characteristics of “agile” teachers?
- Who are the “agile” teachers?
- Why do “agile” teachers teach the way they do?
- What are the barriers and facilitators that impact on agile teachers?
- Are “agile” teachers “great” teachers – and “great” teachers “agile”?
- Do technologies impact on how “agile” teachers teach?

As the data from surveys and interviews were analysed, categorised and coded, six overarching themes emerged that informed an understanding of the characteristics of an agile teacher: These categories were explored identifying distinct connections with the specific characteristics of agile teachers.

1. Drivers
2. Practice
3. Professional Learning
4. Technologies

5. Personal attributes
6. Barriers and conflict

Each of these categories will be discussed in the following sections of this chapter.

5.1 Discussion

5.1.1 – Drivers

In the analysis of the data, the concept of drivers facilitating the development of agile characteristics arose. This section will discuss the findings about factors that drive agile teachers and how they might impact on agility. It would appear from the responses, that to some extent, agile characteristics are something you "have" – however, they are also further developed and learned through experiences, experimentation, curiosity and investigation. "*Teachable moments don't just happen, it requires a willing learner, a capable teacher and clear motivation towards understanding the problem space*" (David). Drivers impacting on agility connect to personal motivation, although sometimes this is not recognised as significant by the agile teacher. Research about intrinsic motivation explores a range of factors that influence the individual and impact on how they are motivated. Effectance of competence motivation (Freidman et al., 2010), refers to how individuals feel good when they experience efficacy and therefore develop their competency further. Aligning with the results of this study, current research also supports the argument that choice enhances motivation, encouraging a feeling of autonomy (Elliott & Story, 2016), another factor identified as a facilitator to agile practice. It has also been shown that individuals who have high levels of intrinsic motivation are more likely to experience "flow", greater persistence and productivity (Froiland et al., 2012; Han et al., 2016).

The findings from this study support previous research on intrinsic motivation, but also show that agile teachers see a range of additional factors (rather than drivers or rewards) as contributing to why they "do what they do".

Curiosity, passion and a desire for innovation and change are additional factors that were identified in the second survey and interviews (and could therefore be considered drivers), aligning with the emerging image of the agile teacher. All interviewees referred to these factors, as did the survey respondents when asked to identify what they thought an agile teacher might "look like". In addition, the agile teacher is also perceived to be usually confident: "*Self confident - believe they can make a difference through their passion, knowledge and determination"* (Willow), and to others, appears driven, but again, not by power, promotion or recognition, but rather focused on making sure learning is appropriate and engaging more than anything else. The "driver" here is identified as being the student and the learning: "*An agile teacher is more focused*

on learning than on curricular compliance and is willing to "colour outside the lines" in order to achieve a superior outcome" (Nadine*)*.

The responses from both the survey and interviews appeared to demonstrate that drivers and motivation for agile teachers were not something they specifically see as evident when reflecting upon their agile practices. Certainly, extrinsic motivation was not raised at all, and no participant identified specific things actually motivating them as such, rather they reflected at length on factors such as being excited about learning, being curious, always trying to improve what they are doing and always looking for ways to be creative and innovative in their practices. Interestingly, the majority of respondents mentioned risk-taking as something they felt was significant to being an agile teacher. This aligns with the survey responses where this characteristic was raised numerous times when asked what an agile teacher "looked like". It would seem then, that agile teachers are motivated more intrinsically than extrinsically – not looking for outside rewards or recognition. It seems they are not noticeably externally motivated, but rather , it is an intrinsic aspect of who they are as people: "*I teach the way I do because I believe it's right"* (Willow); *" I teach the way I do because it's the only way I can" (Joseph)* and *"I believe learning is the most natural thing for humans to do… I have this deep need to create life-long learners…"* (Nadine). This intrinsic motivation aligns well with the concept of self-determination theory described by Deci and Ryan (2002), which describes how the individual is internally motivated to do something because of their interest and self-satisfaction. In their responses the interviewees rarely refer to extrinsic motivators but rather demonstrate motivation and self-efficacy, aligning with these self-determination theories (Trépanier et al., 2012). Autonomous motivation relates to the way in which an individual engages in something from a sense of choice, personal connection and desire (Murayama, Izuma, Aoki, & Mastumoto, (2016), sentiments reflected in the comments made by all interviewees regarding agile practice.

It could be concluded therefore, from the responses that the real drivers for agile teachers stem from who they are, reflecting individual personalities and psyches. Time and again, in the responses from both the survey (observational) and the interview (personal reflection), agile teachers are perceived to be driven primarily by factors that are not able to be tested, are hard to measure explicitly and appear to be personal attributes. Does this, then, mean that agile practice is a mindset that is largely intrinsically driven and demonstrated, but is possible to be acquired (learned) through mentoring and appropriate professional learning? If the drivers have been identified clearly as an awareness of student learning, personal curiosity and less conservative approaches to learning, it seems that given the right professional support and mentoring it would be possible for all teachers to acquire these behaviours (Elliott & Story, 2014). It may be of use to support educators in developing deeply relevant pedagogical practices using a reflective practitioner model (Sachs, 2004), and aligning the newly defined characteristics of the agile teacher within this model.

5.1.2 – Practice

By and large, the responses from survey questions and interviews indicate that the practice of the agile teacher is responsive, spontaneous and reflective, differing from moment to moment, day to day – as stated by David in his interview, *"I'll stop what I'm doing and take advantage of teachable moment... sometimes it takes me away to a different area and a whole new concept but anywhere that it works, is where I want to go*." This practice, also indicated by other interviewees suggests that agile teachers are in tune with their environment, gathering their teaching ideas from the things they see, hear and read. Key to this is the word *ability* as the agile teacher has the *ability* to be spontaneous, and demonstrates an aptitude for seizing an idea and allowing a teachable situation to emerge. It seems this aptitude of flexibility is key to the practice of an agile teacher – by and large, they are not "fly by the seat of their pants" teachers, and are, on the contrary, usually well prepared and know their content deeply, using this information to practise as they do, in an agile and responsive manner. This aligns with Shulman's Pedagogical Content Knowledge framework that focuses on the individual blending content and pedagogy whilst adapting to the needs and interests of the students in their classrooms (Shulman, 1987). "*An agile teacher uses a wide repertoire of teaching strategies intuitively to adapt to the moment to make changes in the classroom environment*" (Nadine) and "*An agile teacher orchestrates the learning intentions in the classroom but is mindful that learning can occur in multiple ways and is prepared to bend to accommodate the teaching moment"* (Joseph). In contrast, some agile teachers can be a bit "in the moment" and may appear to be disorganised by those who like to have lesson documents perfectly structured: "*I don't really plan my lessons because I like to see what is going to be happening on the day. I mean if there is something interesting that is happening during the week or I can take a piece of learning that I have done myself or some reading or something that might respond to a particular problem that a student has, that to me is more appropriate than worrying about it" (Joseph).*

Anecdotal comments were also made by participants about often being seen as the teacher who is "different" – even at times, the one who "rocks the boat" or is not satisfied with doing things the way everyone expects, or even at times, has agreed upon. It seems that the agile teacher needs (personally) to be able to change their teaching plan quickly – this may be seen by others as being "uncollegial" or even that the agile teacher is somewhat of a "loose cannon". One teacher, David, clearly states in his interview responses, "*what you do in the classroom is not always in line with what happens in the greater school*." Perhaps the reason why agile teachers are seen to be so different is because, to some extent, they are not content with how things have always been done, or may struggle with the inflexibility of group planning and may always appear to be excited about something new or interesting, as noted in the survey: "*Can think outside the box and is unpredictable*". Agile teachers may be seen as problematic colleagues to others who are more conservative in their approaches because they are willing to take risks and may, without consultation or notification, do something other than what had been "planned" by the larger group. They could be perceived as being challenging to have on staff as they do question the status quo

and can be somewhat rebellious in nature, at times acting subversively "*If I'm told "no" and I'm frequently told "no" then rather than hitting at it as I used to in my younger years… I now go underground and I go around it" (Willow)* and also, "*I just don't ask any more… because then, I'm often told no… so I just do what I know is good and hope it will be okay in the end*" (Willow).

Regarding their practice as a measurement of success as a teacher, on one hand, agile teachers seem to know generally that they are good (or great) teachers, although they may not use this term as a personal descriptor. They see themselves as adaptable, risk-taking practitioners who identify and respond to needs of students and recognise that they are early adopters of change. On the other hand, reviewing responses from participants, there was at times diffidence indicated in recognising themselves as *being great* teachers. Additionally, interviewees were not totally aligned in recognising that an agile teacher would be considered a *great* teacher and/or a *great* teacher would be seen as agile. It seemed a little perplexing that some respondents could identify another teacher as being "great" and then specify that this person was not at all agile.

Does this, then, come back to the questions raised earlier in this paper, where defining "great" is the real issue? As previously discussed, the term "great" with regards to teachers, is a subjective judgement and whilst there are factors that may be accepted as belonging to this description, there is no one consensus regarding the description of a great teacher (Gose, 2012). If we use the term "agile" to replace "great" and include the personal attributes that affect practice, could this bring teachers closer to having a better picture of practices and behaviours to aspire to, in order to best meet the needs of students? Or might this confuse the concept of agility and align it more with a traditional picture of "great", whatever that may be. It seems that being agile, in itself, is not a measurable practice, but rather a way of thinking that does not have one particular "look". The literature that exists prior to this study, (explored in chapter 2), also grapples with defining the concept of a great teacher, and contends with finding consistency in definition. Nevertheless, Cross (1987) clearly states that "*the myth that we cannot tell an excellent teacher from a mediocre one is as pernicious as it is false*" (p.501). Gose (2012) describes great teachers as unorthodox – with methods that are different to others, working by instinct and not operating with other teachers (p. 3). Gose's description of the great teacher is much closer to some of the characteristics identified in this study of the agile teacher as it suggests *greatness* is driven by intrinsic characteristics that affect practice. By contrast, the majority of descriptors of *great* teachers in other literature (Gose, 2012; Wang et al., 2010; Romanelli, 2016) rely more heavily on observable and measurable elements. It could be accepted, therefore, that whilst others can recognise qualities of greatness in teachers, that "great" can be accepted as a general recognition of having well developed interpersonal skills, and having and demonstrating a strong command of content and pedagogical practices (Shulman, 1987; Gentry et al., 2011; Gose, 2012; Ilaiyan, 2016). The great or exemplary teacher also demonstrates extensive intrapersonal skills, in that they understand themselves and have the capacity for reflective practice and introspection (Collinson, 1996; Gentry et al., 2011; Ilaiyan, 2016). Considering the literature about great teachers and building on the findings of this study, the agile teacher could therefore be determined as being

great using these parameters, with *great* being a contributing factor in the repertoire of their broader characteristics.

Interestingly, whilst the survey respondents quickly defined the agile teacher as “great” one of the interview participants, (Antony), hesitated to define himself as such, stating that he would be concerned about making a statement to that effect, rather preferring to keep a label like that to himself, or perhaps just a few trusted friends. Others, (Willow) did not feel it was an appropriate label for a different reason, citing personal perception as the constraint. Maria also discussed her doubts, in that she felt identifying as agile did not necessarily mean that made her a good or great teacher. These sensitivities may be reflective of a phenomenon referred to as the “Tall Poppy Syndrome” (Plant, 2003; McCulla , Dinham, Brock, Scott, 2015), that describes the lack of desire for an individual to stand out from the crowd or to create an environment of isolation from colleagues (McCulla, Dinham & Scott, 2007). This apparent lack of confidence in “labeling” themselves as agile or great, is interesting and contradictory to some extent, as the confidence agile teachers have in their practices and in taking risks with learning does not always seem to be reflected in their opinion of self – at least openly. (Antony) ”*I’d be careful who I’d describe myself to as an agile teacher… I certainly wouldn’t describe it to anyone I wasn’t particularly close to*”, (Willow)“*Yes, I have doubts [about calling myself agile] because it’s hard to look from outside of myself then think – is that who I am or who I perceive myself to be, so it’s certainly from that perspective that I’m concerned*” and (Maria) “*I think the biggest problem as an agile teacher is that seeing myself as that, doesn’t necessarily mean I’m a good teacher – it means I can change things as I see fit. I think there are some aspects that make me a good teacher and… some that make me not a great teacher. It’s easier to see myself as agile, rather than great…*”

Overall, in spite of some conflicting perspectives and responses, there appears from both the initial survey and the interviews, to be a general congruence of thought in knowing that agile practice enables quality teaching and learning. The contradictions and paradoxes offered through discussions in the interviews may question whether the term “great teacher” can be consistently aligned with all the characteristics of the agile practitioner as per this study, but the general consensus supports the notion that the agile teacher would always have contributory characteristics of practice that are recognisably exemplary (ie “great”).

A point of difference between the two categories involves the identifiable characteristics of the great teacher. These primarily fall into measurable qualities such as organised, consistent, get results, are liked by students etc. *Figure 5.1.2* represents diagrammatically, the acknowledged characteristics of the great or exemplary teacher and how these, along with additional factors identified throughout this study, contribute to the characteristics of the agile teacher. The primary difference in the additional characteristics identified in the agile teacher is that whilst these qualities are recognisable, they may not always be measurable (e.g., curiosity, visionary, intuitive).

In Appendix G this model is demonstrated depicting the dynamic shape and construct of agile, continuously reshaping, redefining and not maintaining a regular pattern or structure.

Figure 5.1.2: Characteristics of the agile teacher

5.1.3 – Professional Learning

The efficacy of teacher professional learning continues to be debated in all education sectors (Jensen, 2013). Discussions about the style and quality of professional learning continue to dominate policy, school focus for strategic planning, and significant financial decisions. Responses provided by participants demonstrate that most agile teachers place a high level of importance on professional learning that is driven by their own volition. They like to think about and create new knowledge and implement new practices initiated by themselves. The data generated from both surveys and interviews indicate that although the agile teacher may be reluctant to attend school-based professional development, seeing these events as “forced” and irrelevant – a time waster, they do continually seek personal professional learning. This observation is supported by Bernhardt (2015) who suggests that frequently, professional development for teachers is not personalised, is often prescribed by school or district leadership and is not readily accepted by teachers.

Overall, the discussions from participants focused on how the agile teacher is always absorbing new information, seeking answers, inquiring and finding opportunities to learn across a wide range of sources. Interestingly, the notion of "one-off" workshops and conferences being ineffective for professional growth (Hill, 2009; Woo 2016), does not seem to be held by the agile practitioner. It would seem that the agile teacher is willing to seek a range of avenues for professional growth and is open to new ideas. This characteristic is supported by Liljedahl (2014) who states that when teachers are willing to broaden their thinking, have a sense of autonomy and are voluntary participants, the single professional learning event is an effective contributor to professional improvement. Of greater importance to the agile teacher is the concept of effectance motivation (Friedman et al, 2010) discussed in a previous section, which is more aligned with the way agile teachers approach professional learning; as efficacy (from developing skills or knowledge) is experienced, the individual seeks to develop knowledge and competency further, maintaining the iterative "agile" cycle of learning and implementation.

When the agile practitioner has a query about practice, student requirements or challenges, they are inclined to seek the information of their own volition without consideration of this being outside the scope of their practice and without seeking someone else to provide the answers or learning opportunities. The professional inquiry and learning undertaken may be through reading, personal research or networking, both physically and using social media such as twitter hashtags, LinkedIn or other professional connection utilities. The agile teacher likes to mingle and network with like-minded peers, finding inspiration in conversations with contemporaries and is always looking for ways to improve their skills or teaching style (Wang, 2010). They approach learning more as a continuum rather than "episodic". The social aspect to effective professional learning is well researched, as supported by Ingvarson, Meiers and Beavis (2005), who identified the significance of the professional community. Agile teachers are seen by peers as being in touch with current research, but also having a critical eye that enables them to be discerning about which elements or strategies they decide to utilise in the learning environment. They remain flexible enough to change this viewpoint should the need arise. It seems that a component of the DNA of the agile practitioner includes open-mindedness and curiosity for information about new and interesting developments globally and interest in how these new developments can be implemented in their classes. This is supported by the notion of constructive alignment (Biggs, 2003), which describes how *what* practitioners and learners want and *how* practitioners teach impacts directly on the efficacy of pedagogy and the construction of knowledge by students. It would seem that the agile teacher has intuitive characteristics that drive them to develop learning practices in an iterative manner, implementing, reflecting, redesigning and re-implementing in an endless spiral of growth (Biggs, 2003). This aligns with the model of agile practice utilised in business, which focuses on iterative, incremental work cadences influenced by feedback and reflection where every aspect of the learning and development cycle is continually revisited and revised (Beck et al., 2002). Characteristics of iterative learning and adaptation also align the model of *agile* emerging in this study with an accepted description in software development and business: "*readiness for motion; nimbleness, activity, dexterity in motion*" (Abrahamsson et al. 2002, p 3).

5.1.4 – Technologies

The concept of being a “tech junkie” or “a bit nerdy” is not uncommon amongst agile teachers. It seems that most, if not all, are excited by digital technologies and by the possibilities that they bring. They do not see technology as the mechanism that necessarily drives them and this is interesting, given that they usually seem to be almost insatiable users of all things technological and are often early adopters. It seems that there is a somewhat symbiotic relationship between the agile teacher’s practices and digital technologies: they feed from one another and are interdependent whilst still maintaining a level of independence; neither drives, but both impact on the other. Overall, the agile teacher is focused on providing high-level learning experiences for students, therefore technology is like any other resource used by these practitioners: it must make a difference and be considered of value if it is going to be part of the classroom repertoire (Ertmer & Ottenbreit-Leftwish, 2010). Stefano comments on this topic, reflecting the sentiment of the majority of respondents, "t*he teaching impacts on the technologies that you use and the technologies impact on your teaching – the two have to be interconnected…”* and from Nadine “*… it’s actually my framework – my theoretical framework – that mostly impacts the technology I choose to bring into the classroom, or I choose to share with my students.”* From the discussions and survey responses, it appears that these relationships between technology and learning are integral to agile practice, but it is the interplay between the two that is significant, not the attraction of the technology itself. In this regard, the agile teacher can be quite critical of the use of technologies and considers that unless technology impacts (positively) on learning it should not be included. This viewpoint is common to other teachers as indicated by Prasad et al, (2015). Agile teachers also reflect on frustrations with constraints to technology use, either through budgets, policies or leadership, that can impact on the way in which technologies are accessed, used within the particular educational context and collaboratively explored with peers. These feelings of frustration are also seen in studies by Wang (2010) and Woo (2016), which have focused on the uptake and implementation of technologies for learning by teachers.

It is noteworthy to observe that the agile teacher slips confidently from using technology to butcher’s paper and markers without having to identify this specifically in planning – “*it just happens – I don’t always make a specific choice about what to use; I just allow a natural selection process to take place” (Joseph).* The agile teacher is also aware of how technology for technology’s sake does not make a difference to learning and that the benefits arise from the way in which new pathways of discovery can be enabled. As indicated by Stefano in his interview responses, “*It’s important to use the technology well – I don’t believe in using technology for the sake of it. So whatever technology is used should be adding to the learning experience.”* The agile teacher is seen by others (see pilot survey responses, Appendix B) as being the “tech savvy” person, or at least, the one who is not afraid to consider and explore new technologies. In general, they connect the technologies to learning possibilities, often seeing opportunities within the technology or resource that is not the primary intention of that resource as designed. Many current

research studies indicate that in spite of numerous educational technologies being available, innovative connections with the technologies are limited (Hull, Scott, & Higgs, 2014) in the average classroom. The technology-enhanced learning (TEL) environment is enabled by the way in which the agile teacher views and utilises the technologies available, connecting new learning experiences with current practice. The agile teacher's adaptability appears to be linked with a willingness to test the waters that creates possibilities for deeper understanding and use of technologies in learning (Keppell, Suddaby & Hard, 2015). Immersed in professional networks with a community of educators who "tinker" and experiment, the agile teacher will integrate digital tools and resources with pedagogical strategies, remaining open to suggestions by students who may have superior knowledge and skills concerning educational technologies themselves. This is another key factor in the use of technology by the agile teacher – they do not feel they have to be more knowledgeable or skilled than their students. They are quite confident in discussing possibilities and enabling the student to explore opportunities that are not "planned". The responses from the interviews note that they will set boundaries for completion such as time frames and outcome criteria desired, but also readily allow the students to choose their own pathways of discovery and creation.

Overall, the agile teacher is competent and confident with digital technologies, investigating and experimenting with technology in much the same manner as they approach other aspects of practice. They are observed and labelled by peers as technically strong. They appear to be naturally drawn to the possibilities of technology, rather than constrained by original purpose and they are exploratory in how they interpret the use of technology to support and add value to learning experiences. At the same time, the agile teacher's ability to be perceptive and flexible in practice enables them to be discerning, to be discretionary without fear and to be comfortable with students being on a different level of use and skill without worrying about "looking stupid" because of the difference between teacher and student proficiency. This fear is common amongst other teachers who often will not use technologies until they are extremely confident, feeling that they need to be a step ahead of the students or they will lose credibility or respect from them (Woo, 2016). Agile teachers have to balance their attraction to digital technologies and the frustration they feel when constrained by school policies, student access, student apathy, financial restrictions and other issues that obstruct the possibilities they foresee in connecting pedagogy with technology. These frustrations on the whole, continue to drive the agile teacher through their perseverance, whereas such frustrations may be blockers for other teachers (Prasad et al., 2015). Agile teachers are sometimes exasperated by the fact that their ideas and technology development are "*not there yet*" (Joseph), and that technology is frequently used as substitution (e.g., creating text documents or truncated mono modal presentations) for traditional teaching methods in many classrooms rather than enabling redefinition of the learning inquiry process.

It would seem that in general, the agile teacher will find solutions for the problems they encounter when using technologies in spite of any issues arising and they continually *"scope out what's happening in the environment, in education, in technology, in the wider world"* (Willow). These qualities enable them to find new paths of learning, trial digital technologies that may not be

obviously designed for the classroom and provide opportunities for the students in their classrooms to experiment with a range of digital technology possibilities rather than taking on the role of always being prescriptive. No-one has to provide professional learning opportunities or workshops for the agile teacher to learn technology skills. Unlike “other” teachers, who will use lack of (provided) workshops and guidance as the reason their technology skills are low (Woo, 2016), the agile teacher searches for their own opportunities and tutorials. They seek new pedagogies that interplay with technology, investigating multi-faceted strategies for both students and themselves, connecting outside the silos of their own schools and physical environments to peers globally through social educational networks, probing for knowledge and ideas beyond the realm of accepted mainstream practices.

5.1.5 –Barriers and conflict

The agile teacher is generally quite open about the elements of teaching that impede upon them being agile. These factors include perceptions that, sometimes, it is just difficult to always be “agile” and that it takes effort to try new things. Often agile teachers feel as though they are working against the tide, trying things that sometimes do not align with school policies, or do not promote the keeping of records of student learning in the prescribed manner and within the prescribed time factors. It seems to take more time to be an agile teacher as one cannot just take programs or worksheets from a previous year and replicate, so sometimes, the agile teacher can feel under-prepared. Perhaps, this is just a perception because the *under-prepared* feeling may come from not having all the elements to the lesson that were hoped for, rather than the true implications of being *un-prepared* for a lesson – underprepared being different in definition to unprepared.

Perceptions by colleagues can be a barrier of sorts for the agile teacher as they are often seen as not quite in line with the “team”: there can be issues with parents of children in other classes who feel their children are missing out on some great teaching and/or great activities (discussed in pick-up lines and car-parks) and feelings of inadequacy or inequality from colleagues. The “Tall Poppy Syndrome” (Plant, 2003; McCulla et al., 2015) discussed previously, was not specifically identified, but is perhaps inferred in comments and discussions that reflect perceptions by others. Agile teachers may try to get colleagues “on board” but this is often met with resistance. Oreg (2003) discussed the resistance to change (RTC) scale, where individuals could be somewhat identified as to their predisposition for opposing change. From the findings in this thesis it would appear that the agile teacher is likely to rank low on this scale whilst other teachers may have high resistance dispositions. Oreg also noted that the level of resistance may draw people to a particular profession (Oreg, 2003). Perhaps agile teachers and resistant teachers are drawn to education because they are on opposing ends of the change resistance scale. For the agile teacher, the draw is the capacity for change, for the other, the ability to maintain patterns and

regularity of practice is the drawcard. The reaction from resistant colleagues can isolate the agile practitioner and cause frustration on both sides. In spite of these issues, the agile teacher usually has an "I'll do it anyway" response and this may further confound relationships with colleagues and department heads. At times, the disapproval from colleagues can have a negative effect on agile practice, not on the characteristics exhibited by the practitioner, but on the actualisation of ideas. One respondent, Antony described several situations where ideas that seemed to be working, but had no "hard evidence" of success (other than teacher feelings that a difference was being made), were met with disapproval, or lack of enthusiasm from colleagues, and consequently were abandoned, "*the [idea], I think was successful, but again, raised a few eyebrows from other staff. So I discontinued… as I didn't feel I had any quantifiable evidence that the work of the students was improving,"* and *"I was so excited to share it with everyone else… I know one other teacher has used it but I'm quite saddened because none of the others have even commented to me yet…"* Ironically, whilst the need for extrinsic motivation does not appear to be acknowledged by most agile teachers as a driving factor, it may be that acceptance of their ideas and approval from colleagues is a factor that can affect them to some extent. It does not appear to prevent them from continuing with agile practices by and large, but may dampen enthusiasm at times or make them go "underground" (see comments in *5.1.2 Practice*). Revisiting the literature on change practices it appears that much of the focus is on the individual as a primary source of opposition (Erwin & Garman, 2010). In this situation, the resistance is by an individual towards an individual, perhaps linked again with the "Tall Poppy Syndrome" concept.

Agile teachers can also experience barriers when approval has to be sought for purchases, resources or activities that differ from the mainstream. Sometimes, they have to compromise a little in terms of use of existing infrastructure such as a particular Learning Management System, or because the school has already committed to other resources and additional applications cannot be used. Sometimes, time and resources available just have to be lived with, underlining the need for the agile teacher to be adaptable and work with the existing restrictions. As Antony states, "*It's approved by the school already so I'm just going with it as the best thing that's available. Finding a better alternative and then convincing those who are able to make those decisions… I just don't have the time… that's the best I can do for them for now."*

The dissonance that was evidenced in the discussions by interviewees was somewhat of a surprise, particularly when addressing factors that might make them appear "not agile" in their practice. Comments about rigid curriculum requirements preventing agile practice seemed to be in direct contrast to the way an agile practitioner might be expected to respond. Comments by Antony reflected the way in which the curriculum for some topics completely restrained flexibility, and yet he was also able to recognise the frustration and boredom this created: *"there are a couple of subjects like child protection and drug education that come to mind as subjects where we're forced to follow a very rigid curriculum, where for reasons of child protection there have to be two teachers in the classroom and we end up with 60 kids sitting in a room where we're forced to follow again a very rigid curriculum and the children have to essentially copy down notes for an*

hour. Children get restless, very frustrated and we get frustrated as well by being prohibited from being agile in these scenarios. This is a regulatory thing...we have no choice in the matter" (Antony) This seems entirely contradictory to the general theory emerging in this study as the data suggest that the agile practitioner responds to challenging learning situations, adapting and attempting to engage learners in the content. Surprisingly, this agile teacher felt constrained by the curriculum and did not respond to these limitations by creating alternative strategies for the students. Why should the children *have* to copy down notes for an hour or *get frustrated* because of the boredom of the activities and content? One would expect the agile teacher to respond quite differently to this situation. Another interviewee, Stefano, commented that in meeting syllabus requirements you may be forced to do things in a particular way and that meeting legislated requirements necessitated this lack of agility, "*Sometimes the curriculum itself prevents you from adopting the best ways of doing things – to meet the requirements you are forced to meet".* From all the other discussions in this study about flexibility and adaptability, it could be expected that the agile practitioner would not find the curriculum or legislated requirements constraining, but rather see these as challenges to find ways to address these expectations and still manage to provide a more interesting approach to the task.

In contrast to the conflict felt by the interviewees, the responses from the survey indicated that the agile teacher would always be able to deal with curriculum issues, adapt and create engaging and appropriate learning experiences that complied with any requirements and still reflected the needs of students. It is interesting to see that when a range of teachers discuss the characteristics of the teacher they see as agile, they see someone is not really affected by barriers and conflict, but rather one who just accepts that these things are there as hurdles to overcome rather than barriers. Yet, two of the self-identified agile teachers have indicated a contrary perspective. It may be thought that this could be due in part to teaching experience, but the two respondents who felt hampered by the curriculum were at opposite ends of the "years of teaching" scale, with one having less than five years' experience and the other 10 years or more. Experience then, would seem to be an insignificant factor in this paradox. The answer may well lie in further research beyond the scope of this study, but is certainly worthy of exploration.

5.2 Implications

The audience for this research includes a wide group of stakeholders in education, including policy makers, the individual education sectors, practitioners and indirectly, students. This research should be of interest to all educators, encouraging a broader understanding of the significance and implications of adaptability, curiosity and tenacity for both the teacher and students. This study is about recognising "what lies beneath" exemplary teaching practice and could be a guide for how to best support the recognition, development and sustainability of agile practitioners. The concept of agility is one that would be beneficial in pre-service teaching programs, encouraging a more divergent approach to pedagogy and the development of learning activities. Agile characteristics embody the significance of understanding student needs, flexibility

in working with these needs and the persistence to pursue the challenges of change. In 21st century teaching models, the goal of learning has changed to encompass preparation of the student to be a creative problem solver who is able to think critically and divergently, adapting to new technologies and opportunities as they present themselves in the global community (Bernhardt, 2015). In this ever-changing world, as stated by Mokhtar et al. (2013), teaching and learning is considered to be in a state of transformation with a need for adaptability and the development of strategies to address these changes paramount in education. Recognition of the characteristics of the agile teacher and focusing on enabling opportunities for teachers to develop an awareness of how these characteristics could assist in reaching the goals of learning for the 21st century would therefore be of benefit to the education sector at large. Aligning the significance of iterative reflection and development for teachers and learners (i.e., the *agile learner* in addition to the agile teacher) may enable greater flexibility and adaptation to the rapid changes of thinking, technology and access to information that is currently experienced. Figure 5.2a and 5.2b demonstrate the flow of reflection, development, application and re-development of planning and practice for the agile practitioner. Variations of the models in Figure 5.2a were developed by business organisations to visually demonstrate the processes of traditional or accepted practices and agile practices. They show the significance in the difference between accepted (traditional) models of practice and the iterative cycles of agile practice.

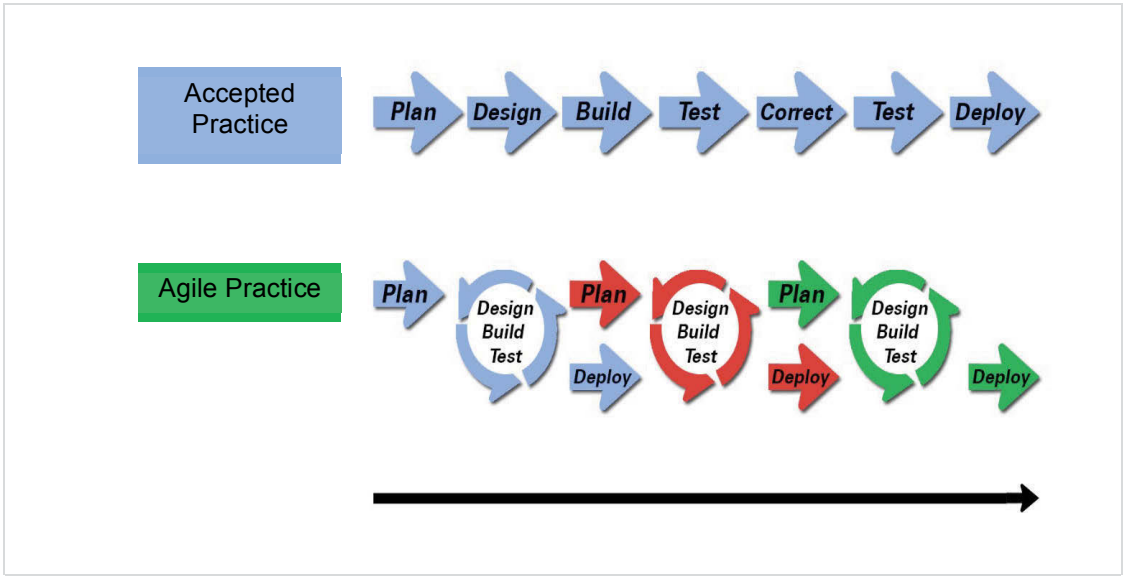


Figure 5.2a Agile practices in comparison to accepted (traditional) practices

Adapted from -Untitled image: Accessed https://keepingagile.files.wordpress.com/2012/06/genericagileconceptideogram.png

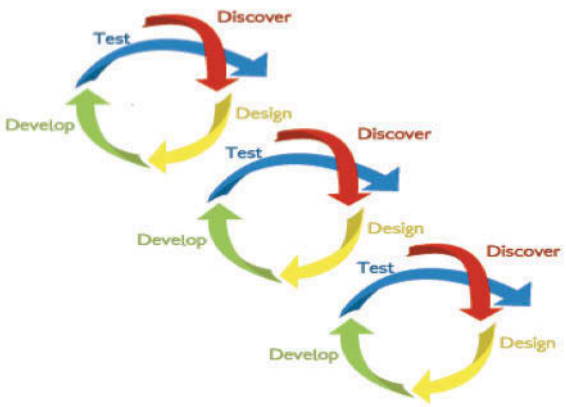


Figure 5.2b Iterative Agile practices

Untitled image: Accessed https://keepingagile.files.wordpress.com/2012/06/genericagileconceptideogram.png

These models can be further developed when the emergent theory from this study is considered, aligning the outcomes with other pre-existing models such as the Reflective Practitioner Model (Schon, 1983) that refers to reflection-in-action and "on the spot experimentation" in practice and Kolbe's Learning Process Diagram (1984). Interpretations of the Reflective Practitioner Model have been widely utilised in education, including by Brookfield (1995), who developed the model to include multi-faceted reflective perspectives. Whilst there are elements of these models that are similar to the agile practice model, they have significant elements missing, particularly the iterative properties of discovery, flexibility, adaptation, innovation and (re) development – essential components of the agile model. Figure 5.2c demonstrates the emergent model of the agile practitioner in action developed in this study.

The arrows represent the interrelationship and relativity of all elements, as the model does not rely on any component of practice coming before or after the other. The iterative practice of the agile teacher could be represented by a continuous sequences of processes, with innumerable cycles (Figure 5.2d), still suggesting the original concept of agile described in literature from the business sector but now adapted to be reflective of the outcomes from this study. The model emerging, takes the form of iterative instances and cycles of exploration, discovery, design, innovative implementations, further development, adaptation and reflection for additional iterations. The model reflects the characteristics and practices of the agile practitioner, continuously moving in a non-linear fashion through iterative implementations, strategies and approaches to learning.

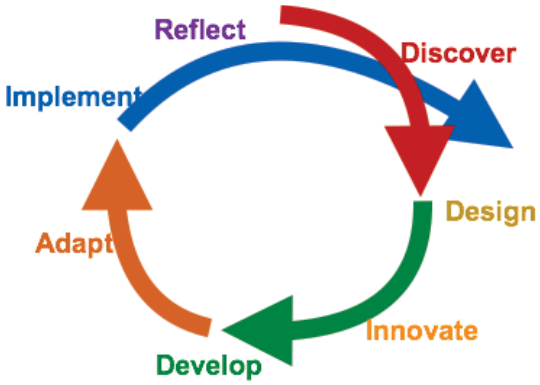


Figure 5.2c Emergent model of the agile practitioner in action.

Author's own image – adapted from Untitled image: Accessed https://keepingagile.files.wordpress.com/2012/06/genericagileconceptideogram.png

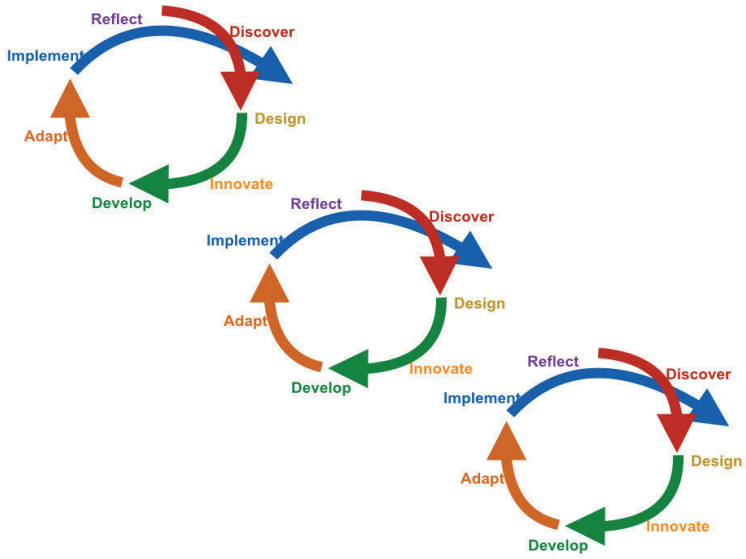


Figure 5.2d Iterative model of the agile practitioner in action.

Author's own image – adapted from Untitled image: Accessed https://keepingagile.files.wordpress.com/2012/06/genericagileconceptideogram.png

5.3 Further investigations

Some issues were raised that are currently outside the scope of this study but worthwhile in continuing the development of a deeper understanding of the characteristics of the agile practitioner. Issues such as intrinsic motivation, the impact of professional learning changes, technologies in the hands of the agile practitioner and the model in practice would be worthy addendums to the research undertaken. As the theory from this study has emerged, outlier reflections that divulge concepts such as espoused beliefs of agility might be explored more deeply, investigating the correlation between perception and practice. Of further interest may be the impact of the agile teacher on the underachieving student or on the high achieving student;

additionally, this study may lead to exploration of the characteristics of the agile learner and/or the agile learner in the 21st century.

The issues that arose in the study around curriculum and leadership/peer restrictions would benefit from deeper analysis, probing more deeply into how curriculum requirements might/might not impact on the demonstration of agile practice. The dichotomy surfaced when responses from the main survey indicated that curriculum was not an issue for agile practitioners and that indeed, they would always find ways of making the curriculum "work", yet several interviewees reflected this as a problem for their own agile practices. Leadership issues were raised by a number of respondents across the surveys and interviews and would therefore be worthwhile investigating further. A component of the leadership inquiry might also be to explore whether agile practitioners are more likely to move into leadership roles than other practitioners and to explore the impact of agility on leadership "success".

The study has explored an idea that agile teachers have characteristics that influence the way in which they approach teaching, embrace change and pursue excellence. The agile teacher displays attributes that include inquiry, scepticism and determination. They are intrinsically curious and bold, not adverse to taking risks, embracing the challenge of innovation. The agile teacher is multidimensional, intuitive and interpretive, demonstrating particular characteristics that identify but do not constrain them in practice. The study has shown that the agile teacher is passionate, seeking alternative strategies for situational pedagogy, deconstructing traditional approaches and interpretations as a response to student circumstances, re-engineering resources and environments to enable epistemological journeys for all students. The *characteristics* of the agile teacher may be readily identified whilst the *definition* of agile may prove to be polysemous, with a range of definitions and descriptions co-existing alongside expected practices and characteristics.

5.4 Conclusions

Unlike previous research (see chapter 2, Literature Review), this study has identified a new descriptor for the exemplary teacher, the term "agile", and has given insight into how and what the agile teacher or practitioner *thinks,* as well as what they *do* and *say.* The study identifies characteristics, thoughts and behaviours that make agile teachers "tick". By questioning the thinking and inner drive of the agile practitioner, the study has found that agile teachers believe that teaching in this adaptive, responsive way is a natural thing to do, in much the same way as learning is integral to being human. They see that they "*have no choice"* and that their passion for learning motivates even when challenges and barriers present. These characteristics of self-determination and self-efficacy are well researched and identified in other studies that explore the traits of highly effective or high achieving individuals, linking them with commitment, optimal functioning, adaptive functioning, job satisfaction and achieving personal vision (Trépanier, Fernet,

& Austin, 2012). This study has considered additional factors to previous research, building on the notion of self-determination and self-efficacy, considering the reflections of the practitioner in response to challenge, change and the need for adaptation, and exploring additional characteristics that identify the underlying foundations of agile practitioners.

It seems from the interview responses that agile teachers see everything they do as being "natural" to them, connecting their practice to open mindedness, as they are always looking for new ideas. They know and appreciate that in order to change and improve, they will benefit from connecting to networks of practitioners, model alternative practices, make suggestions and be challenging in their ideas and conversations. The agile teacher identifies that they teach the way they do because it's "just what they do". They do not really feel there is any other way of teaching and are really not aware of "why." They see learning as integral to life and characteristics such as persistence, inquiry and curiosity as part of their makeup, their DNA not just as a teacher, but also as a person. They are generally "agile" in all aspects of their lives, so their teaching practices are an extension of who they are. On the whole, they thrive on new ideas and change – evolving without hesitation and reflecting on their practice as they teach. They see student "behaviour" or lack of interest as a challenge, not a barrier, and search for ways to make learning meaningful for their students.

Agile teachers are aware that students, like all people, have strengths, weaknesses, likes and dislikes and display a range of factors that facilitate and inhibit learning. They often see their own personal strengths and weaknesses as interchangeable and as drivers for improvement in practice. They see student weaknesses as drivers for challenging practices and doing things differently. They are able to turn most situations and issues into challenges that provoke thought and the seeking of alternative pathways, or of new ways of doing things that might make a difference. They create activities that enable differentiation rather than differentiated activities and guide students through the learning journey, recalculating like a Global Positioning System (GPS) whenever they miss the desired outcome or take a "wrong" turn. "Wrong" is seen as a different pathway to understanding, not seen as "incorrect" or failure. Agile teachers are able to support students in finding their own answers, not always making the journey "easy" for the students, but encouraging them to explore divergent and unconventional ways of learning.

The study has revealed that agile teachers describe themselves as continuously learning, never feeling that they have become "great" teachers, reflecting constantly on their practice and looking for ways to improve as both teachers and learners. It is, perhaps, this characteristic of seeing oneself first and foremost as a student and learner, exploring ideas, searching for answers and discovering ways of learning at every opportunity, that helps us understand the ways in which agile teachers operate. Their professional learning networks (PLN) are usually a mix of face to face, online groups and aggregated connections through hash tags in twitter and the like. Listening to responses made by participants in the interviews, I developed an understanding that

agile teachers love difficult conversations where they are challenged to think outside their known experiences and grapple with new thoughts about existing practices.

It may have seemed, at times, that the results of this research study could be described in a short statement – *agile teachers are just who they are*: it is a personal make-up, a characteristic of the individual, a kind of inner drive that is unquantifiable and "unlearnable". The study has, indeed, identified that many of the characteristics of the agile teacher are driven by their existing passions and natural curiosity, but it also has demonstrated that many characteristics and practices are able to be learned, established through exposure to the practices of others, access to a wide network of practitioners and ideas, familiarity with existing and emerging technologies and the courage to be "imperfect" and take risks. The study was not implemented in order to tell teachers what they should or should not be doing, but to identify the characteristics of the agile teacher and encourage others to develop creative, critical thinking, reflective practices, demonstrating open mindedness, responding to the changing needs and resources available for learning and perhaps, above all, the development of passionate curiosity. The agile teacher will seek out and use whatever resources they can to redefine learning possibilities, using technologies, connecting with peers across physical and virtual networks, enduring frustrations, isolation and personal investment (financial and human capital) in their intrinsic drive for more.

The description of "Bricoleur" (Strauss, 1990) was previously discussed in this dissertation as a way of describing the qualitative researcher. As the theories in this study emerge, this notion could justifiably be applied to the agile teacher's characteristics, demonstrating proficiency yet "non-subordination" to the resources available, re-purposing curriculum design as a response to student need, demonstrating persistence and constructing new practices. The view of bricolage aligns with the characteristics of the agile teacher, reflecting diversity, persistent intent, the tenacity to construct and implement innovative practices, to embrace iterative and flexible approaches to the development of pedagogical strategies and to have the ability to show adaptability when considering their particular scope of practice. As this study concludes, there appears a natural alignment of "agile" to bricolage, with improvisational processes underpinning innovative applications, using resources (student needs, technologies, physical and virtual) with skill, creativity and perseverance to recreate new materials or possibilities within a particular learning environment. Agility, like bricolage, is made up of a collection of characteristics or dimensions, reflecting experience, intuitive and learned practices, pedagogies and beliefs, described by Kincheloe as "*a kinetic epistemology of the possible"* (2005, p346).

It could be concluded from this study that the characteristics of an agile practitioner include (but are not limited to) the range of descriptors in *Figure 4.3.1b* and *Figure 5.1.2*. The characteristics of the agile practitioner facilitate openness and flexibility, exhibiting the ability to be adaptable and responsive to change, continuously improving and reshaping practice, building knowledge and skills, applying these skills as required in response to new problems, and altered paradigms. A significant outcome of this study indicates that beyond the specific

agile characteristics identified, it is how the agile practitioner *thinks* and *responds* to facilitating and inhibiting mechanisms in the learning environment that is of importance. Their generation of an autopoietic practice where re-engineering and reconceptualising self occurs, enables adaptation to changing pedagogical contexts, emerging digital technologies and the individual learning narrative of each student.

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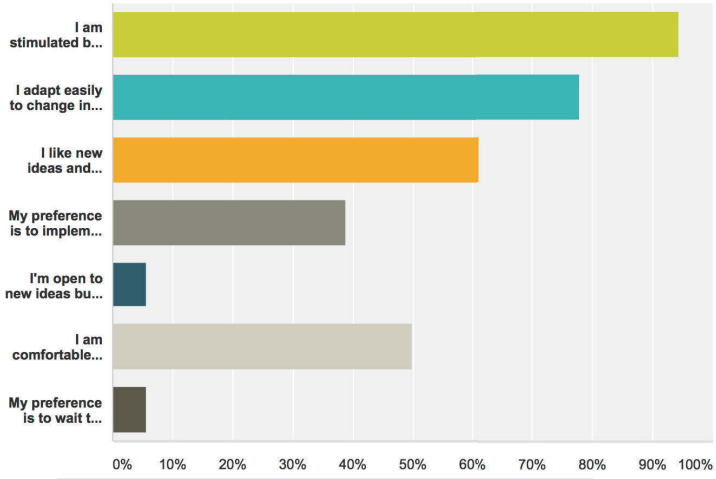
Appendix A – Pilot Survey

Sample Questions and data

Q5

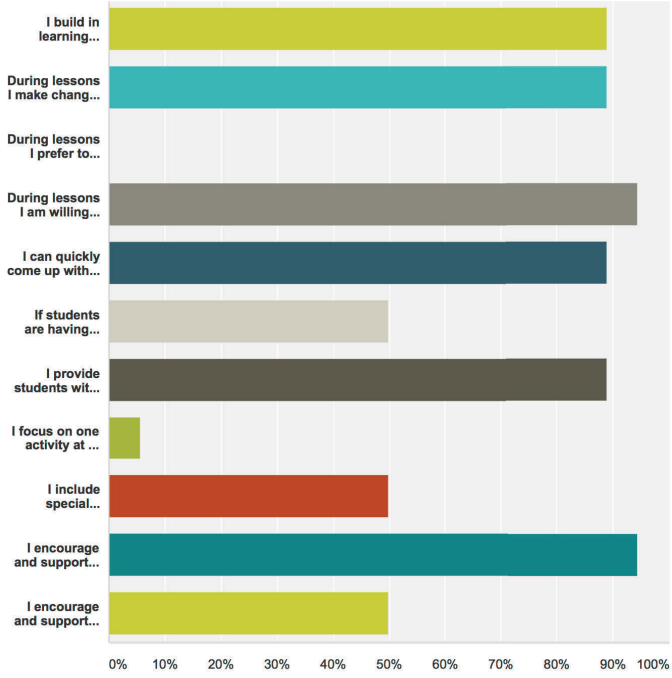
Select from the following statements to reflect your current perspective on change in teaching and learning. Choose as many options as applicable.

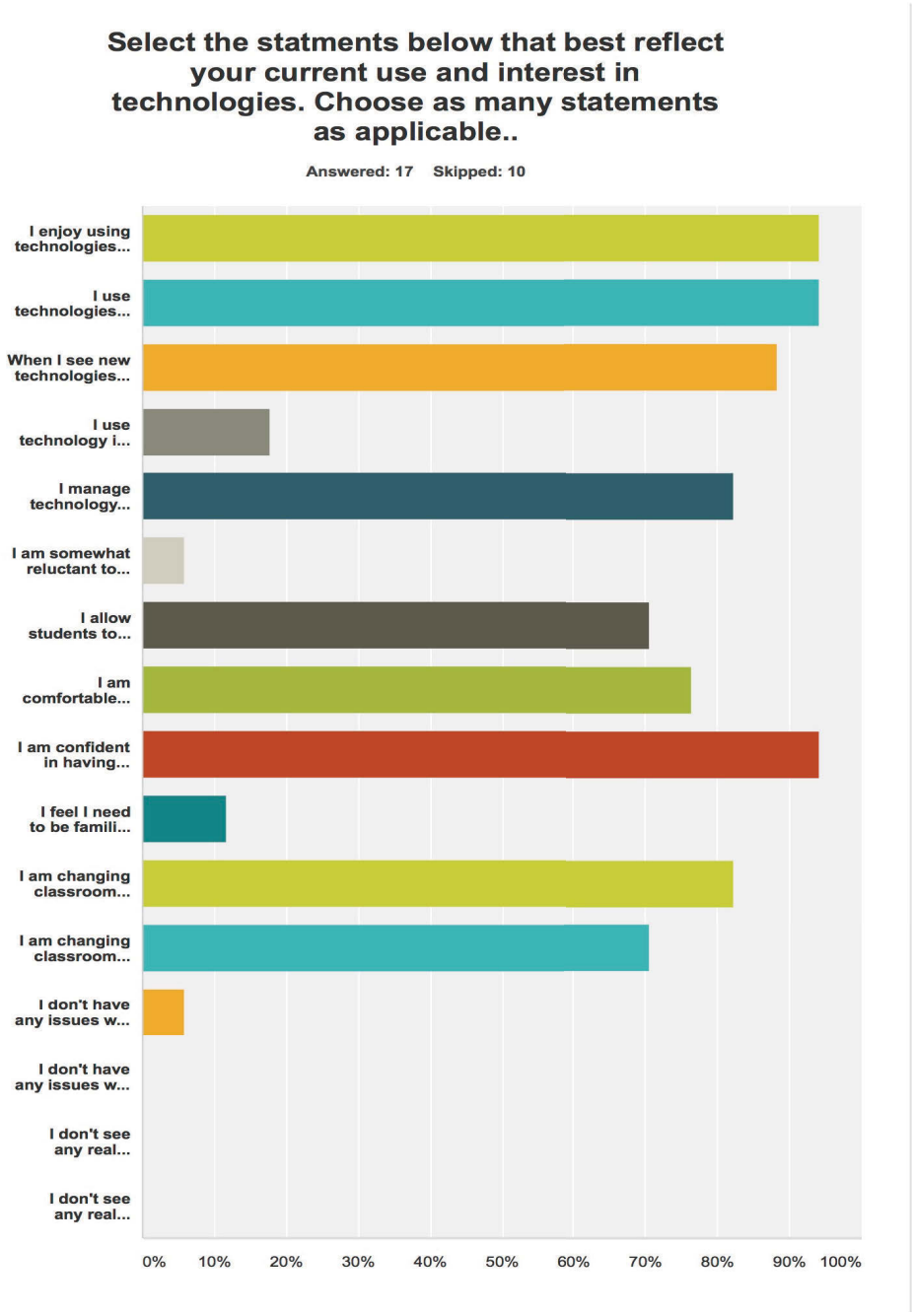
Answered: 18 Skipped: 9



Q3

Please select as many of the following statements as you feel apply to your style of teaching.

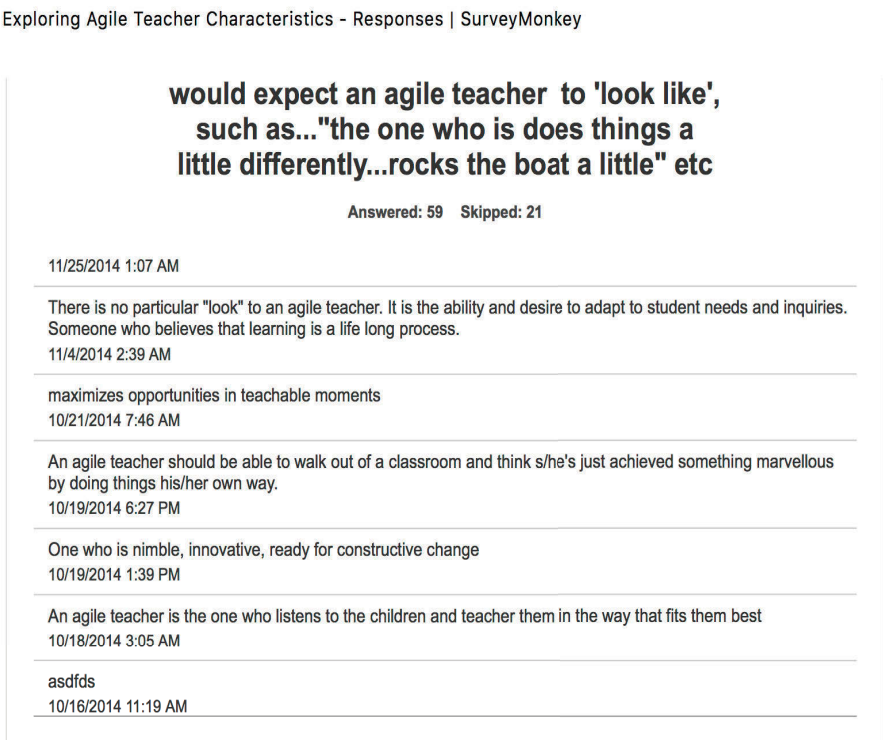




Full pilot survey questions and responses:
https://www.surveymonkey.net/results/SM-3CPNKHNR/

Appendix B – Second Survey

Sample questions and responses:



Exploring Agile Teacher Characteristics - Responses | SurveyMonkey

would expect an agile teacher to 'look like', such as..."the one who is does things a little differently...rocks the boat a little" etc

Answered: 59 Skipped: 21

11/25/2014 1:07 AM

There is no particular "look" to an agile teacher. It is the ability and desire to adapt to student needs and inquiries. Someone who believes that learning is a life long process.
11/4/2014 2:39 AM

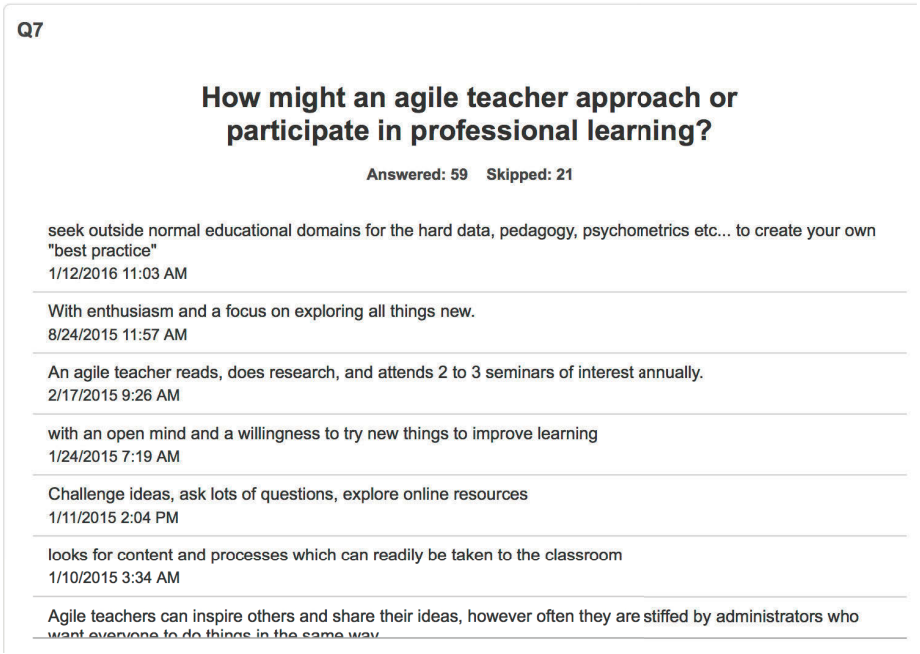
maximizes opportunities in teachable moments
10/21/2014 7:46 AM

An agile teacher should be able to walk out of a classroom and think s/he's just achieved something marvellous by doing things his/her own way.
10/19/2014 6:27 PM

One who is nimble, innovative, ready for constructive change
10/19/2014 1:39 PM

An agile teacher is the one who listens to the children and teacher them in the way that fits them best
10/18/2014 3:05 AM

asdfds
10/16/2014 11:19 AM



Q7

How might an agile teacher approach or participate in professional learning?

Answered: 59 Skipped: 21

seek outside normal educational domains for the hard data, pedagogy, psychometrics etc... to create your own "best practice"
1/12/2016 11:03 AM

With enthusiasm and a focus on exploring all things new.
8/24/2015 11:57 AM

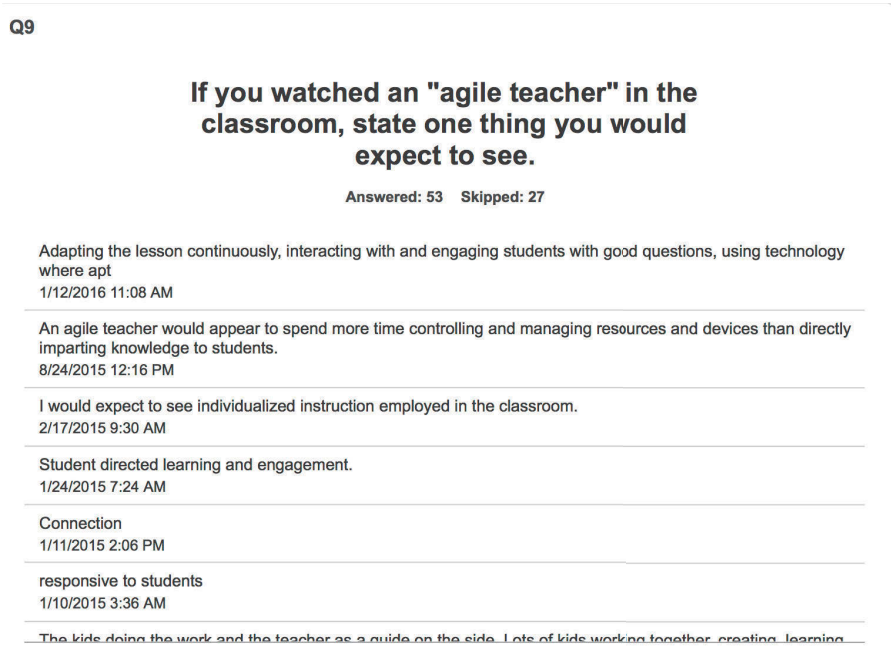
An agile teacher reads, does research, and attends 2 to 3 seminars of interest annually.
2/17/2015 9:26 AM

with an open mind and a willingness to try new things to improve learning
1/24/2015 7:19 AM

Challenge ideas, ask lots of questions, explore online resources
1/11/2015 2:04 PM

looks for content and processes which can readily be taken to the classroom
1/10/2015 3:34 AM

Agile teachers can inspire others and share their ideas, however often they are stiffed by administrators who want everyone to do things in the same way



Q9

If you watched an "agile teacher" in the classroom, state one thing you would expect to see.

Answered: 53 Skipped: 27

Adapting the lesson continuously, interacting with and engaging students with good questions, using technology where apt 1/12/2016 11:08 AM
An agile teacher would appear to spend more time controlling and managing resources and devices than directly imparting knowledge to students. 8/24/2015 12:16 PM
I would expect to see individualized instruction employed in the classroom. 2/17/2015 9:30 AM
Student directed learning and engagement. 1/24/2015 7:24 AM
Connection 1/11/2015 2:06 PM
responsive to students 1/10/2015 3:36 AM
The kids doing the work and the teacher as a guide on the side. Lots of kids working together, creating, learning

Full survey questions and responses:

https://www.surveymonkey.net/results/SM-6K278HNR/

Appendix C – Jotform

Sample Jotform questions

Look at the images below - "choose" ONE image that in some way connects you as an educator. The images themselves are not clickable - they are to be used to guide your respones to some of the questions below.

**To see images individually, in a larger format , please go directly to the iCloud gallery.

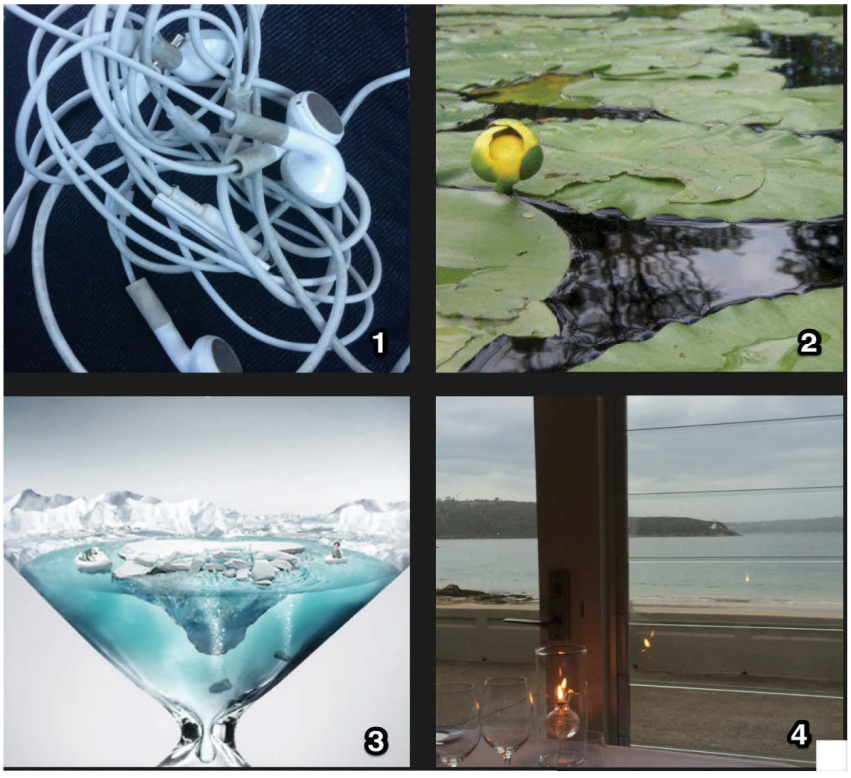
To tell your story, consider the questions that follow these images, and either video or audio record your responses for each question.

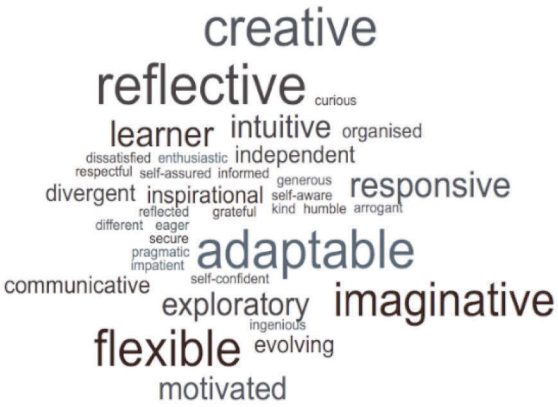
Please record directly through this application as you review each guiding question (click **record** button in each question to do this) - don't worry if you hesitate or make a mistake, just keep recording.

If you are using an iPad or other mobile device,select "choose file" and you can create a video response directly in your camera application. When finished, select "use video" and your video will attach to the Interview.

If you have problems with the recording or saving function (this may take a long time depending on your bandwidth) - please use soundcloud or a similar online recording application and add your link/s for your responses to the "any other comments box at the bottom of this resource.

Your responses will be kept private and will not be shared publicly under any circumstances.





2) Reflecting on the descriptors of agile teacher characteristics in the word cloud image above, please discuss the characteristics that you consider make you an agile teacher.

Q2 Record your response here Record ▶ Play 0:00

3) Do you have any doubts or hesitancies about categorising yourself as an "agile" teacher?

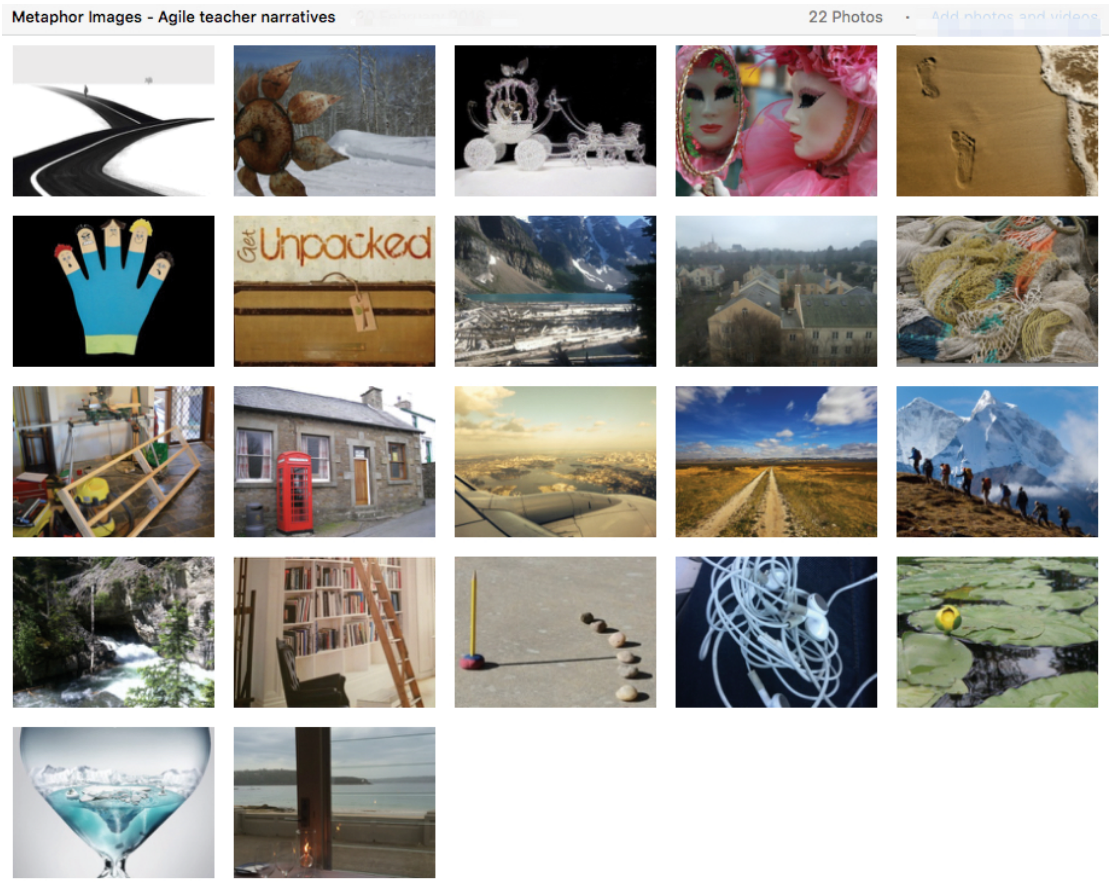
Q3 Record your response here Record ▶ Play 0:00

4) Are there practices that you use that you think don't make you look "agile"?

Q4 Record your response here Record ▶ Play 0:00

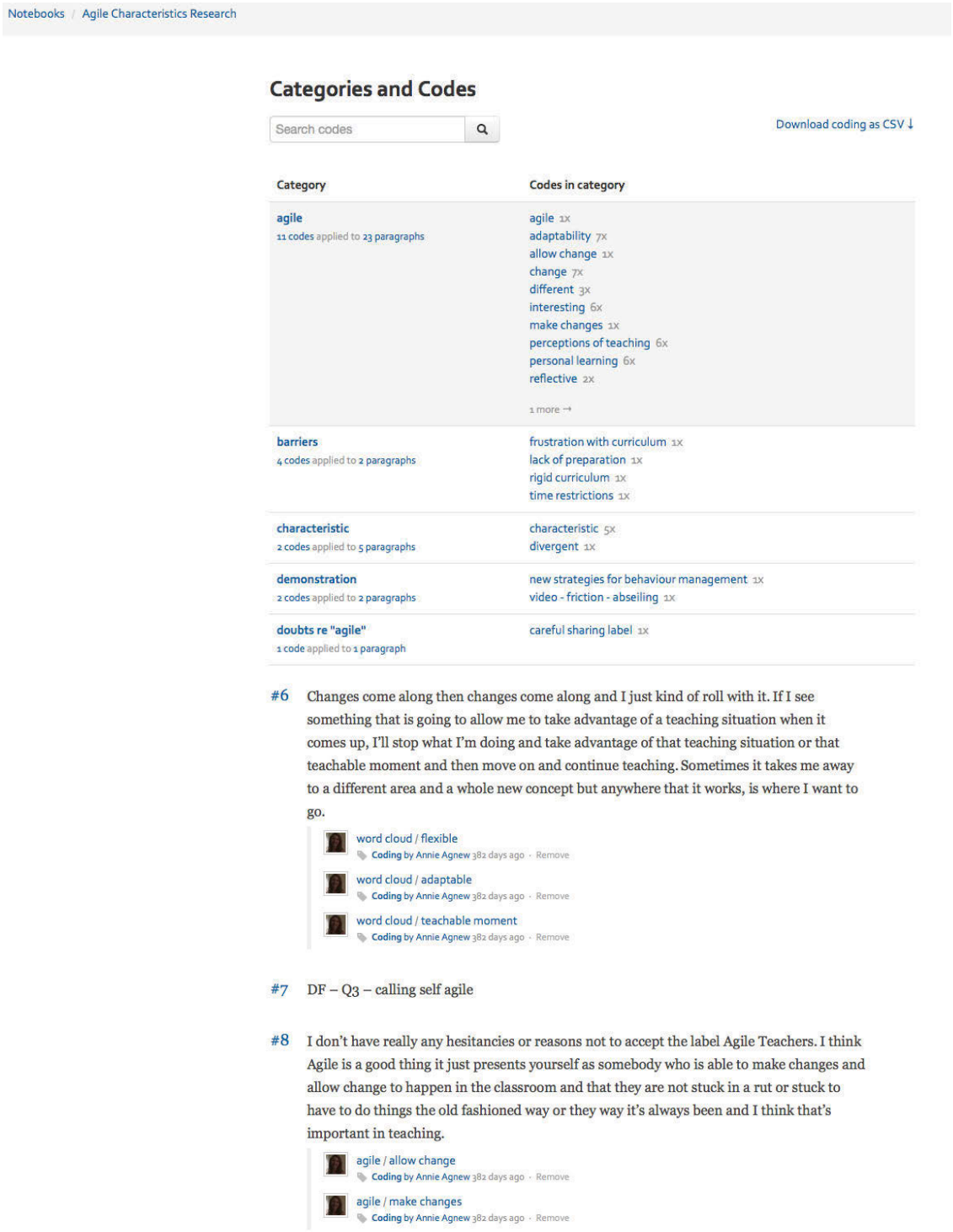
1. Link to PDF of all questions on Jotform: https://dl.dropboxusercontent.com/u/26627963/Appendix%20C_Embracing%20Innovation.pdf
2. Link to Survey online: https://form.jotform.co/50069097858872
3. Jotform: https://www.jotform.com

Appendix D – Visual Metaphor Images



Link to visual metaphor images on iCloud: https://www.icloud.com/sharedalbum/#A45oqs3qPKENX

Appendix E - Saturate



Notebooks / Agile Characteristics Research

Categories and Codes

Search codes

Download coding as CSV ↓

Category	Codes in category
agile 11 codes applied to 23 paragraphs	agile 1x adaptability 7x allow change 1x change 7x different 3x interesting 6x make changes 1x perceptions of teaching 6x personal learning 6x reflective 2x 1 more →
barriers 4 codes applied to 2 paragraphs	frustration with curriculum 1x lack of preparation 1x rigid curriculum 1x time restrictions 1x
characteristic 2 codes applied to 5 paragraphs	characteristic 5x divergent 1x
demonstration 2 codes applied to 2 paragraphs	new strategies for behaviour management 1x video - friction - abseiling 1x
doubts re "agile" 1 code applied to 1 paragraph	careful sharing label 1x

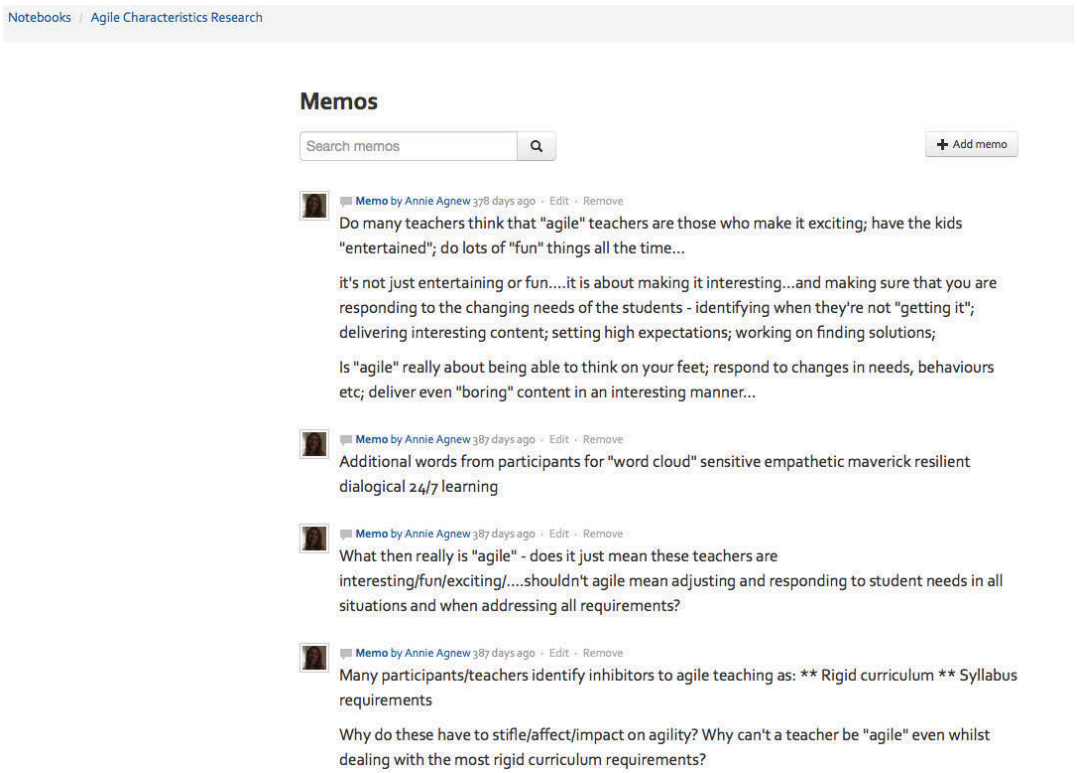
#6 Changes come along then changes come along and I just kind of roll with it. If I see something that is going to allow me to take advantage of a teaching situation when it comes up, I'll stop what I'm doing and take advantage of that teaching situation or that teachable moment and then move on and continue teaching. Sometimes it takes me away to a different area and a whole new concept but anywhere that it works, is where I want to go.

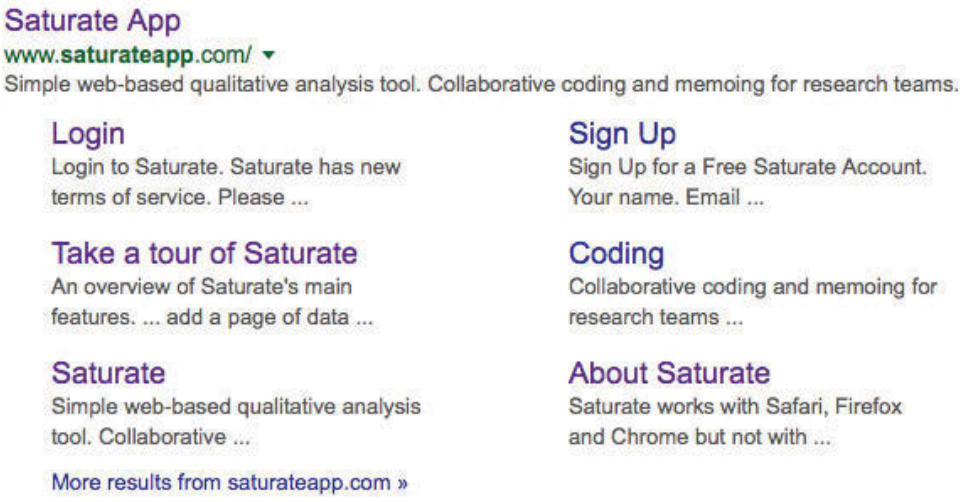
- word cloud / flexible
  Coding by Annie Agnew 382 days ago · Remove
- word cloud / adaptable
  Coding by Annie Agnew 382 days ago · Remove
- word cloud / teachable moment
  Coding by Annie Agnew 382 days ago · Remove

#7 DF – Q3 – calling self agile

#8 I don't have really any hesitancies or reasons not to accept the label Agile Teachers. I think Agile is a good thing it just presents yourself as somebody who is able to make changes and allow change to happen in the classroom and that they are not stuck in a rut or stuck to have to do things the old fashioned way or they way it's always been and I think that's important in teaching.

- agile / allow change
  Coding by Annie Agnew 382 days ago · Remove
- agile / make changes
  Coding by Annie Agnew 382 days ago · Remove





- Saturate App: http://saturateapp.com
- Take a tour of Saturate App: http://www.saturateapp.com/help

Appendix F – Reflections of Agile Practice

**Why do I teach the way I do? I believe learning is the most natural thing for humans to do. So, from my point of view, students are natural born learners and as a teacher, I'm only there to help them. I'm there to help them learn better, learn more. I'm also there to provide some boundaries for students – to guide them to follow the right path. When you get really excited about something, like students do, when students engage in their learning, in their own personal learning process, they get really excited about what they are learning and what they can do.

**So here's the thing, if each student has their own personal subject speciality it would be really stupid for me as a teacher to think I can pour the same amount of information or instruction on top of these people and that they would all miraculously absorb it and learn it and be ready. So, I realised that I need to individualise the teaching. It's not always easy to do. Personalisation of learning, it's the biggest challenge we have for this century, I believe. But it's doable…it's doable when you change your mindset.

**So students' agency in their own learning is so important that we cannot afford to ignore it any more. They are not sheep; they are not something that needs to be mass-produced. They are unique individuals and we need to personalise the learning and by emphasising the agile ways of teaching, we can get there. That's why I was so excited about this research. That's why I teach how I do – I'm passionate about good quality learning.

**I teach the way I do because it's the only way I can. I was teaching before I had any qualifications, which might have something to do with the kind of teacher I have become as an agile teacher.

**If something worked I would run it again and if it didn't I changed it. If the kids were happy I was happy, if the kids were bored or miserable then I knew that whatever I was doing wasn't working and I always knew that it was never their fault. If the kids were bored or if they were acting up the only reason for that ever happening is the content that you were delivering and the learning experience that you were providing isn't working and I would say that irrespective of behavioural needs of students, which is a big claim which a lot of teachers would probably refute. So I teach the way I teach because that's the only way I know and any other way doesn't make any sense.

**Well, I am in the classroom to really try and prove to these children that learning can be exhilarating. So I am intent that not only will they find it exhilarating but that they will understand

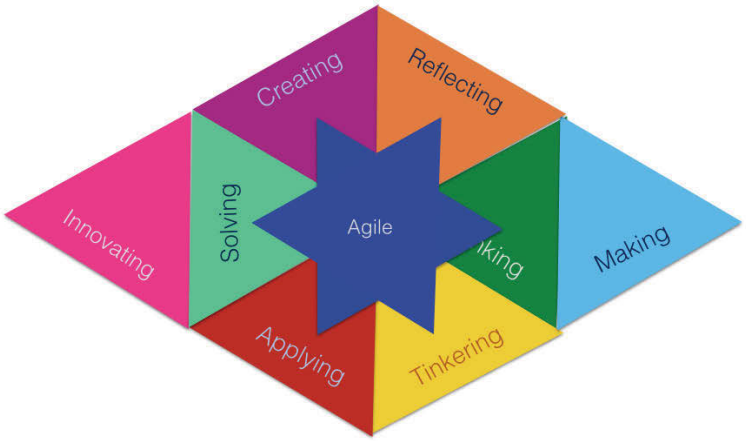
that the person in front of them really is enjoying what he's doing, because he finds learning quite exciting and he's open to all the ideas they've got and will quickly applaud those who take risks…as he does himself.

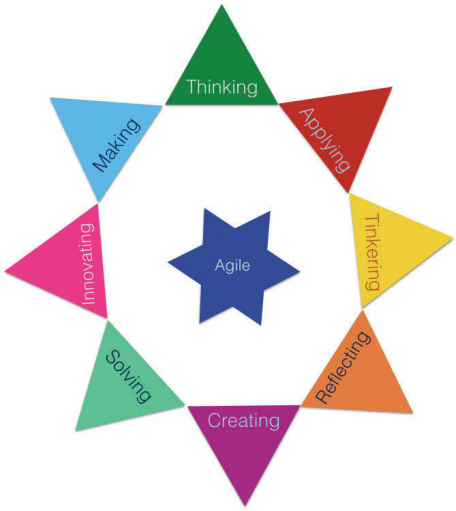
**I wish I could say there wasn't another way of teaching, I think. I teach the way I do because I believe it's right. I teach the way I do because I believe that there are few reasons to teach in another way. I hate the idea of standing at the front of the classroom and filling heads with knowledge, although that is necessary from time to time to be able to impart our wisdom and understanding in a particular problem but especially when students are not engaged in the whole [education] packaging process and the whole un boxing process of information

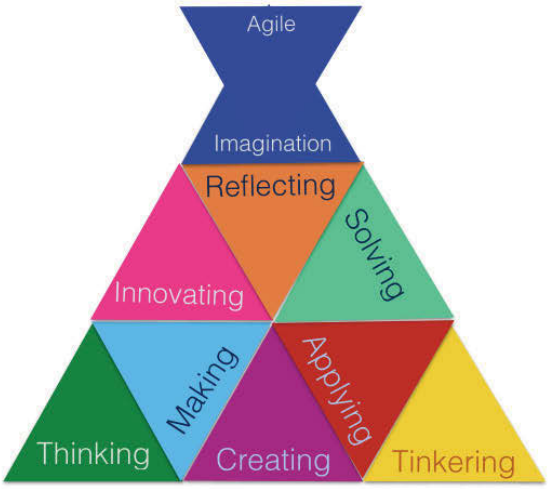
**That's an easy one – why do I teach the way I do…because I think it should be fun. And I think that not only should it be fun, it's something that is totally individually driven – but within a social construct. So I think it's important for people – for kids – to learn how to work together; it's important for them to develop as people themselves, to go to wherever they .want to go – but it's got to be fun…otherwise it's just "boring as"

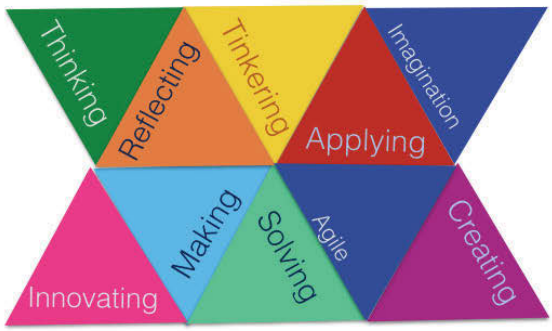
**I guess I teach in a way that I enjoy…and that I understand the content. my teaching has been shaped by the teachers that I had but also in experiences that I enjoy, so I try to make learning fun with lots of hands on activities that relate to the real world. That's how students understand – by sing examples that students understand and letting them develop their knowledge through those experiences. For example, in the garden, outside and measuring things in the playground. So these are the things that I enjoy and it's almost like an attitude – if you enjoy learning, you want students to see that enjoyment and embrace their learning and want to learn more too.

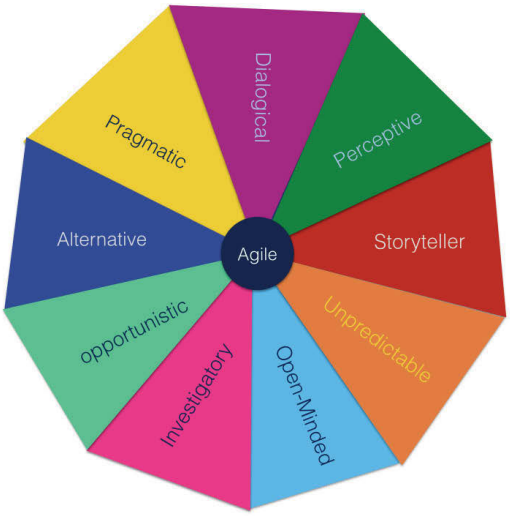
Appendix G – The Agile Model











Development of Best practices to Agile taxonomy – animation: https://dl.dropboxusercontent.com/u/26627963/Development%20of%20Agile%20taxonomy_animation.m4v

Appendix H – Survey invitation

9/26/2014

I am currently undertaking a research study that is endeavouring to grapple with understanding the teacher who is adaptable to change, is flexible and able to "seize the day" or teachable moment. For the purpose of this study, these teachers will be referred to as "Agile" teachers
Would you please take 15-20 minutes of your time to answer this survey for me:
https://www.surveymonkey.com/s/agile_teaching.
Thanks, Annie

7:42 AM

I am currently undertaking a research study that is endeavouring to grapple with understanding the teacher who is adaptable to change, is flexible and able to "seize the day" or teachable moment. For the purpose of this study, these teachers will be referred to as "Agile" teachers.

Would you please take 15-20 minutes of your time to answer this survey for me: https://www.surveymonkey.com/s/agile_teaching.

I's also be most appreciative if you would pass the survey link on to other teachers who might be willing to respond.

Thanks, Annie

Appendix I – Ethics Acknowledgement

Research Study Exploring "Agile" Teacher Characteristics:

The purpose of this study is to grapple with understanding the teacher who is adaptable to change, "agile" in their approach to teaching - promotes adaptive planning, evolutionary development, continuous improvement and encourage rapid and flexible response to change - the one who "seizes the day" or teachable moment. For the purpose of this study, these teachers will be referred to as "Agile" teachers

The word cloud above reflects the most common responses from educators who responded to an earlier part of this study - descriptors of the characteristics of an "agile" teacher - if you feel the words also describe you as a teacher, please take 10 - 15 minutes of your time to tell your story by responding to the questions below.

You may access the full ethics approval and consent form for this research study here. Please read and select "consent agreement" before continuing with this activity.

Consent agreement

☐ I give consent to participate in the research study "Exploring Agile teacher Characteristics"

**Ethics approval and consent form for research study

Appendix J – Teacher gender distribution

Education : *Percentage of female teachers by teaching level of education*

Customise | Export | Draw chart — Sample - review website for further data

Page: 1 /3

Indicator	Percentage of teachers in lower secondary education who are female (%)							
Time	1999	2000	2001	2002	2003	2004	2005	2006
Country								
Hungary	85.6	84.5	84.2	82.7	83.3	77.9	78.1	78.1
Estonia	(*) 84.6	84.6	84.9	..	..	..	..	82.4
Brazil	84.2	84.3	83.8	85.6	89.3	86.8	88.5	..
Latvia	82.5	83.8	84.2	84.7	84.8	85.0	84.9	85.3
Chile	77.6	77.9	..	77.3	..	78.1	78.1	78.1
Israel	(*) 76.7	(*) 77.3	(*) 77.7	(*) 78.1	(*) 78.5	(*) 78.5	(*) 78.1	(*) 79.0
Iraq	(*) 76.6	76.6	..	..	(*) 59.3	59.3	..	..
Italy	73.3	72.8	73.1	73.8	75.3	75.6	75.2	75.7
Argentina	73.2	71.2	67.5	67.5	(*) 70.2	73.1	72.3	73.6
Finland	70.6	71.1	71.1	71.4	71.7	71.8	71.9	..
Monaco	69.2	..	70.0	..	..	..	..	..
Dominica	(*) 68.0	(*) 68.9	(*) 67.3	66.0	57.3	65.0	56.9	63.2
Cuba	67.9	68.3	67.1	66.7	67.1	65.2	63.6	63.7
Croatia	67.2	68.4	68.2	68.9	69.3	..	70.5	71.0
France	67.1	64.1	64.5	63.0	64.1	65.1	64.3	63.9
Malaysia	65.1	(*) 62.0	(*) 63.3	(*) 64.2	(*) 63.8	(*) 64.4	..	..
British Virgin Islands	64.2	..	(*) 65.3	(*) 63.5	65.7	62.3	66.9	66.9
Austria	63.8	..	..	66.2	66.8	68.0	68.2	68.8
Greece	(*) 63.6	..	..	..	..	64.3	64.1	65.5
Denmark	63.1	64.0	64.1	..	..	..	..	..

** Percentage of teachers worldwide who are female
** Distribution of teachers by gender per country