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Teachers' Professional Dispositions and Orientation towards Tablet Technology: Towards a more nuanced understanding of teachers' adoption of technology in South African private secondary schools

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Suzanne Lee Sackstein



A research report submitted to the School of Education, Faculty of Humanities, University of the Witwatersrand in partial fulfilment of the requirements for the degree of Masters of Education

Johannesburg
December 2013

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DECLARATION

I declare that this research report is my own unaided work. It is submitted for the degree of Masters of Education at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination to any other University.

Suzanne Lee Sackstein

December 2013

DEDICATION

I dedicate this masters report to my mother Wendy Cohen and my late father Leslie Cohen. Even though they did not have the privilege of furthering their own education, they sacrificed so much to provide me and my sisters with an education of our own. Mom and Dad I thank you for always making me try my best, never giving up and supporting me in all that I wanted to do. I could never have started this journey without you.

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ABSTRACT

Rapid improvements in technology have resulted in increasing calls to integrate educational technology into classrooms. Much of the contemporary educational technology literature premised on constructivist pedagogic practices, have offered promissories of radical change to traditional pedagogic practices and formal education due to the use of educational technology. Past research has shown that teachers do not automatically choose to adopt technology in the classroom nor radically change their pedagogic practice, simply due to the presence of technology. Recent technological innovations such as mobile technologies, and more specifically tablets, are once more being advocated as a powerful means for radically transforming teachers' teaching practices and enhancing learning in schools. Calls to incorporate tablet technology into the classroom are being driven by the groundswell of popular opinion demanding its inclusion, as well as contemporary research advocating constructivist pedagogic practices. Educational research thus far has explored classroom practices where technology has been adopted and has tended to focus on the resulting changes in teaching and learning. Research aimed at explicitly understanding teachers' orientations to the new technology at stake, coupled with an understanding of the reasons behind teachers' choices to adopt or not adopt technology have not yet been fully explored. With the intention of developing a more nuanced understanding of teachers' technology adoption choices, a conceptual framework using the constructs of teachers' *Professional Dispositions* and their *Orientation towards Tablet Technology* has been derived from the work of Bernstein on the pedagogic discourse, Hoadley and Ensor on Professional Dispositions and Hooper and Rieber on educational technology adoption. Using a mixed methods research methodology, data was collected at three advantaged private secondary schools in which it was found that a relationship does indeed exist between teachers' Professional Dispositions and their Orientations towards Tablet Technology. From the study it is clear that teachers have principled reasons in relation to their technology adoption, with *teachers' pedagogic mode being critical in shaping decision to adopt or not adopt technology* and their *construal of their subject knowledge structure influencing the type of technology adoption activities* used by teachers, with internet access and productivity being the most widespread and collaboration of learning being the least. Furthermore, it was found that teachers across all Professional Dispositions *expect the use of tablets in educational contexts in the future to increase*.

Keywords: Educational Technology, Tablet Technology, Professional Disposition, Orientation towards Tablet Technology, Pedagogical Discourse, Technology Adoption

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TECHNICAL DEFINITION OF TERMS

Mobile Technology: Refers to any cellular or wireless network technology that enables people to be productive, anywhere and at any time. The most crucial characteristics of mobile technology are its smallness of size, portability and internet capabilities (Livingstone, 2004). Within this study, mobile technology includes cellular phones, gaming tools as well as tablets.

Tablet: Also referred to as a *tablet computer* or *tablet technology*. This is any flat, graphic, one-piece device that uses either touch or a digital pen instead of a keyboard or a mouse (Dictionary.com, 2010). Within this study, the term tablet will specifically refer to tablet devices such as the iPad, Android or Windows Surface.

ABBREVIATIONS AND ACRONYMS

PD	Professional Disposition
PD-I	Professional Disposition – Instructional Discourse
PD-R	Professional Disposition – Regulative Discourse
OTT	Orientation towards Tablet Technology
LA	Levels of Adoption
LA-F	Levels of Adoption – Familiarization
LA-U	Levels of Adoption – Utilization
LA-I	Levels of Adoption – Integration
LA-R	Levels of Adoption – Reorientation
LA-E	Levels of Adoption – Evolution
MA	Manner of Adoption
MA-P	Manner of Adoption – Product/Support
MA-I	Manner of Adoption – Idea/Innovation
AA	Adoption Activity
AA-H	Adoption Activity – Horizontal
AA-C	Adoption Activity – Current Reported Usage
AA-E	Adoption Activity – Envisaged Reported Usage

CHAPTER1: INTRODUCTION

1.1 Objective of Research Report

This research study, located in the field of Curriculum Studies, investigates teachers' Professional Dispositions (PD) and their Orientations towards Technology (OTT) with a view to developing a more nuanced understanding of the forms and levels of tablet adoption in the classroom.

The utilization of technology in the classroom is not a new phenomenon. Since the beginning of the 20th century, new technological developments have been promoted or offered as promissories that would radically change pedagogic practices in schools and strengthen teaching and learning (Cuban, 1993). However, Cuban (1986) argues that these promises have been largely unfulfilled. Reviews of research advocating the use of technology in schools have shown that while the majority of teachers in the past have used these innovations, the nature of their use has been largely as a substitute to earlier technologies, without substantial shifts in pedagogical practices (Cuban, 1986).

Currently, technological innovations, such as mobile technologies, and more specifically tablets, are being advocated as a powerful means for radically transforming teachers' pedagogic practices and enhancing learning in schools. Increasing calls to incorporate tablet technology into the classroom are arguably being driven by a groundswell of popular opinion demanding its inclusion, and by contemporary research into educational technology and pedagogy especially, but not exclusively, by advocates of constructivist learning theories and learner-centred teaching (Jaffer, 2010; Hooper & Rieber, 1995).

Most of the educational research thus far has explored classroom practices where technology has been adopted, and has tended to focus on the resulting changes in learning and teaching, relative to either the stages of adoption (Hooper & Rieber, 1995) of technological innovations or on the challenges of adopting it. There has also been a strong focus on learner changes as a result of the technology and socio-cultural studies of changing classroom practices where technology has been adopted (Hooper & Rieber, 1995). However, there appears to be limited research explicitly aimed at understanding teachers' orientations to the new technology at stake, coupled with an understanding of their pedagogical orientations and PD's. Research with this as a focus can potentially shed light on teachers' differential adoption of tablet technology in contexts and settings where this type of technology is available and being advocated by school management, or even required by the schools' stakeholders and policies (as is currently the case in the majority of private schools in South Africa). Consistent with this objective, this study provides a more nuanced understanding of teachers' Orientations towards Tablet Technology in the classroom and more specifically investigates whether there is a

relationship between teachers' Professional Dispositions and their adoption of tablet technology in the classroom.

1.2 Background to Research Problem and Preliminary Literature Review

Educators, particularly in advantaged private schools, are facing ever-increasing demands to integrate and utilize tablet technology in the classroom, with the expectation that tablet technology will improve the quality of education they offer. There are a range of possible reasons for this demand. One possible reason may be attributed to an argument that learners, being part of the digital generation are digital natives that have different orientations to learning and to knowledge (Prensky, 2001). Prensky (2001) defines learners as digital natives who are "native speakers of the digital language of computers, video games and the Internet" (pg1), whereas he defines teachers who were not born into the world of digital technology as digital immigrants, since they are being gradually forced to adopt technology later on their lives. (Prensky, 2001). According to Prensky (2001), there is an overwhelming gap between learners and their 'digital immigrant' instructors, which demands a radical transformation of formal educational environments, as "traditional institutions do not meet the needs of the new digital generation" (Bennett & Maton, 2010, pg322). In this claim, the use of digital technology by both teachers and learners is taken for granted, but what is at issue is how to use it effectively (Prensky, 2001). However, many researchers have refuted the 'digital native' claim due to its inability to portray the complexity of an entire generation through its homogeneous definition (Jones, 2010). Maton (2007) asserts that while there is a proportion of the younger generation that is extremely adept with technology, there remains a significant proportion that has not yet sufficiently mastered these skills.

Another possible reason for the growing demand to include digital technology in schools may be in response to the enormous technological transformation occurring within contemporary society (Roschelle, Pea, Hoadley, Gordin, Means, 2001). Frank, Zhoa and Borman (2004) argue that presently, the prevailing belief is that schools need to implement technology innovations "either because it enhances productivity or because of strong institutionalized legitimacy" (pg149) and social considerations. Many of those advocating educational technology believe that utilizing technology in schools is a critical component necessary to prepare today's learners for the rapidly changing society of digital information and learning (Wang & Reeves, 2003). Cobcroft, Towers, Smith & Bruns, (2006) cite external factors, such as market trends and the changing costs of technology; and internal factors, such as learner preferences, staff capabilities and pedagogical approaches, as playing key roles in influencing the content and manner of pedagogic discourse required at present.

The above mentioned reasons enable an understanding of the backdrop of calls to integrate technology within the classroom, but they do not address key educational questions and issues at stake. Jaffer

(2010), points out that the majority of contemporary research within the field of educational technology has been premised on the notion of a learner-centred pedagogical view. Proponents of educational technology have cited multiple benefits, including the following: improved literacy and numeracy skills; independent and collaborative learning experiences; individual learner assistance; and improved learner engagement (Attewell, 2005). Wang and Reeves (2003) suggest that constructivist learning theories, in which the learner rather than the teacher is viewed as central, appear to be the predominant assumptions or ultimate goals towards which technology innovation in the classroom strives. However, Jaffer (2010) points out that although particular pedagogical approaches are neither good nor bad in themselves, the problem is that the majority of educational technology advocates, who believe that technology innovations will promote learner-centred classrooms, have "discarded instructional design as a form of pedagogy" (pg289).

It is essential to be aware of this predominant orientation to learning and pedagogy if one is interested in researching differential adoption of educational technology by teachers, as those who do not adopt it within the classroom may not hold the same assumptions about learning and/or pedagogy. Several researchers (Cuban, 1986, 1993; Hooper & Rieber, 1995; Kuhn, 2007) claim that past technological innovations within formal education have failed, pointing out that "the educational system has scarcely changed during the past 50 years" (Hooper & Rieber, 1995, pg155). Cuban (1993) argues that educational institutions appear to be less open to educational technologies than other sorts of institutions due to "existing cultural beliefs about what teaching is, how learning occurs, what knowledge is appropriate in schools and the teacher-learner relationship" (pg185). Thus, although there is a growing demand to utilize tablet technology in the classroom, technology use within educational contexts is not a simple one dimensional issue.

1.3 Personal Rationale

The impetus for this study has been drawn from a preliminary investigation into a tablet technology pilot programme at a private secondary school that I and a colleague conducted (Sackstein & Spark, 2012). My own background is in the field of Information Systems, where the use of technology is advocated in order to improve and enhance current working procedures. Therefore, I held very strong views, as to the benefits of tablet technology before I embarked on pilot research into the adoption of tablet technology. I expected widespread adoption of tablet technology by teachers and/or a positive response towards integrating tablet technology into the classroom. However, initial research findings have not confirmed these projections, with teachers located on either ends of the continuum of adoption or non-adoption or somewhere in between (Sackstein & Spark, 2012). The preliminary investigation addressed the question of whether teachers did or did not adopt the tablet technology based on the Unified Theory of Acceptance and Use of Technology (UTUAT) model of technology adoption (Venkatesh, Morris, Davis & Davis, 2003). However it is apparent from the findings that the

reasons for differential responses to incorporating the technology and forms of adoption are still unclear. It was therefore decided that an alternative technology adoption model, that could describe teachers' levels of technology adoption, should be investigated.

Research into tablet technology usage within educational contexts is important: firstly, because currently teachers in advantaged private schools within South Africa are being increasingly coerced to include tablet technology in their classrooms. Secondly, as tablet technology becomes more affordable there will be increasing pressure on state schools to do the same, particularly state schools that are located in more affluent areas. Although at this point in history it is not clear how technology will evolve, nor how affordable or widely accessible it will be, it is however important to be aware that there are significant socio-economic, socio-cultural and political questions that will need to be addressed and investigated with respect to tablet technology, but these are beyond the scope of this study.

This research study has focussed only on advantaged private schools, for the reason that many private schools in the Johannesburg region are currently introducing tablet technology within their schools and some are embarking on pilot programmes in order to establish which method/s of tablet technology implementation will enhance teaching and learning in their schools. Although a range of approaches have been set up by schools, this research has only studied 1:1 programmes, wherein teachers and all learners in the classroom have their own tablets.

Huge investments in tablet technology are being advocated within private secondary education with the promise of a more relevant and engaged learning environment, however as noted in the introduction to this study, there are significant educational issues at stake in integrating technology into the classroom, and therefore it seems important to examine the issue of adoption in a more complex, multi-dimensional manner.

The study aims to explore teachers' orientations to technology and to pedagogy in order to develop a deeper understanding as to the grounds for teachers' tablet adoption behaviours. The theoretical foundation for this study is based on the construct of teachers 'Professional Dispositions' as defined by Hoadley and Ensor (2009) and Hooper and Rieber's (1995) model of educational technology adoption.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In order to develop a conceptual framework for investigating underlying reasons for teachers' orientation to tablet technology in their classrooms, a review of the literature germane to the field of educational technology, Professional Disposition and Orientations towards Tablet Technology, is presented in this chapter.

2.1 Educational Technology

Since the middle of the twentieth century, new educational technologies such as instructional television, multimedia, personal computers etc. have been introduced into schools on the basis of promissories that they would revolutionize teaching and learning (Cuban, 1993). However, as discussed previously, advocates of educational technology use, maintain that past technology innovations have failed to deliver the promissories offered by its campaigners (Cuban, 1986, 1993; Wang & Reeves, 2003). It is worth reiterating the point made above that Cuban (1986) attributes these apparent failures to educational institutions being less open to technology than other sorts of institutions, due to a constancy and change paradox with respect to the relationship between teachers and technology. According to Cuban (1986), teachers either do not shift their pedagogical practices or shift them slowly while technology is evolving at an escalating rate, creating a tension in the teacher-technology relationship. Cuban (1986) argues that either the teacher or the technology will be victorious and therefore, according to Cuban (1986) as teachers are still employing traditional pedagogic practices, technology cannot be effectively utilized – as he puts it, 'Computer meets classroom: Classroom wins'. This apparent lack of educational technology integration may also be attributed to a clash between the views of teachers and educational technologists, as educational technologists give the impression that current and traditional pedagogic practices must shift towards more constructivist and less teacher directed pedagogies (Jaffer, 2010; Hooper & Rieber, 1995) in order to be successful.

There are two possible reasons for this dominant view being prevalent among those advocating the use of educational technology. One may be attributed to Constructivism as a learning theory being viewed as preferable to Instructivism (Duffy & Jonassen, 1992; Hooper & Rieber, 1995; Kuhn, 2007; Perkins, 1991; Wang & Reeves, 2003), while the second may be due to a tendency to conflate learning theories and privileged pedagogic practices (Jaffer, 2010).The first reason proposed is based on overwhelming evidence of claims for superiority of Constructivist learning theories within the contemporary educational technology literature (Cuban, 1986, 1993; Hooper & Rieber, 1995; Reiser, 2001; Roschelle, et al., 2001; Wang & Reeves, 2003). For much of the twentieth century, Instructivism, fuelled by Behaviourist psychology, positioned the teacher as central to the learning process, with

knowledge passively acquired by learners but explicitly specified and transmitted by teachers (Jaffer, 2010). Constructivist theories in education, which were arguably born in response to the rejection of Behaviourism and Instructivism, assert that human beings impose meaning on the world by interacting with the physical, social and mental worlds around them (Duffy & Jonassen, 1992), created from processing or reflecting on prior experiences (Von Glasersfeld, 1989). Piaget, who developed the theory of Cognitive Constructivism (Swan, 2005) also maintained that learning is undeniably a property of individuals, not teachers. Vygotsky, while in agreement as to the location of knowledge within persons, differed from Piaget in that he claimed that learning is fundamentally a social activity in which the human mind is transformed from its actual developmental level to its potential developmental level by collaboration with more capable peers (Jaffer, 2010; Swan, 2005). Thus the constructivist perspective is frequently accompanied by strong learner-centred pedagogy where the learners are constituted as active participants who must construct their own understanding (Perkins, 1991) with the teacher merely as a facilitator in the knowledge construction process (Wang & Reeves, 2003).

As noted, much contemporary educational technology research has tended to advocate technology as the enabler for more individualized learning based on learner discovery, thus advocating a shift away from teacher-centred instruction (Wang & Reeves, 2003), as computers are viewed as more cooperative than teachers in enabling the ultimate goal of authentic learning environments controlled by learners (Reiser, 2001). One view mentioned by educational technology proponents, as confirmatory of a constructivist based view, is that instructivist style learning is focussed mainly on presentation, memorization and recall of content alone, which is outdated given the prolific use of technology and explosion of information within today's society (Duffy & Jonassen, 1992). Although the ubiquitous standpoint within educational technology literature is one in which the progression from Instructivism to Constructivism and collective knowledge (Ravenscroft, 2001) is perceived as preferable, Czerniewicz (2007) points out that this is not necessarily so clear cut because both proponents of Instructivism and Constructivism propose the use of educational technology. At one extreme, behavioural and instructive views are dominant while on the other extreme, cognitive and constructive views dominate, with neither being viewed superior to each other.

At this point, it is important to be aware that while advocates of constructivist learning theories recognise learners can only learn through the construction of their own understanding and thus propose learner-centred environments, constructivism is not a theory of teaching but rather a theory of learning (Jaffer, 2010). Not all Piagetians and not all Vygotskians believe that it is unimportant to create well-structured learning paths (Jaffer, 2010). Piaget advocated activities should be carefully planned to promote assimilation and accommodation and Vygotsky argued that the mediator within the learning process is crucial in the initiation into scientific concepts or systematized knowledge.

However, as Jaffer (2010) has noted there has been a tendency to conflate learning theories and pedagogic practice, thus enabling pedagogic constructivists in discarding "instructional design as a form of pedagogy because of its association with authoritarian ideology and objective knowledge" (Jaffer, 2010, pg17). Advocates of pedagogic Constructivism downplay the role of the teacher. For example, Perkins (1991) claims that because learners construct meaning based on their experiences, pedagogic practices must therefore actively promote this type of learning in order to enable construction of knowledge to occur.

Jaffer's (2010) claim is premised on concepts derived from psychological constructivism which have been incorrectly recontextualised within pedagogic practices. She argues that this view is erroneous for several reasons. Firstly, theories of learning explain the nature of knowledge and how an individual learns, while pedagogy describes the functions and relationships of teachers and learners and the activities they perform (Jaffer, 2010). Psychological constructivism deals with theories of learning and how human beings come to know, while pedagogic constructivism focuses on pedagogy in relation to teachers' roles and strategies in the learning process (Jaffer, 2010). Theories of learning and pedagogic practices are not equivalent and therefore it is implausible to match underlying psychological theories as decisively shaping the form of pedagogy practiced. Secondly, pedagogic constructivists believe that direct instruction contradicts the very basis of psychological constructivism. Psychological constructivism, however, does not dictate pedagogic practice but rather asserts that individuals learn in the course of constructing knowledge from the world around them irrespective of the specific teaching strategy employed: i.e. "how individuals learn is not dependent on how they are taught" (Jaffer, 2010, pg287). Thus according to Jaffer (2010), pedagogic constructivists have erred in deriving pedagogic practice from their preferred constructivist theory of knowing (Jaffer, 2010). Finally, Jaffer (2010) cites the association of a specific pedagogic practice with a particular learning theory as one with moral implications. Pedagogic practices are neither intrinsically 'good nor bad' but are rather dependant on how they are utilized within the classroom. Pedagogic constructivists have evaluated Instructivist pedagogic practices as inherently bad, whilst Constructivist pedagogic practices are perceived as innately good (Jaffer, 2010). This perception has influenced educational technologists to discard instructional design with the vision of Constructivism as a learning theory and pedagogic practice as the goal (Kirschner, Sweller & Clark, 2006).

However the bias towards a Constructivist pedagogy may not be the only reason for the apparent lack of educational technology success being advocated by those favouring educational technology integration. Howard and Maton (2011) claim one possible reason for this may be attributed to the fact that much contemporary educational technology research is anecdotal rather than grounded in sound evidence due to a lack of powerful theoretical frameworks being developed in the field of educational technology. Howard and Maton (2011) propose that the majority of educational technology research is

being carried out in isolation from other research within education, and that this in turn, has contributed to the widespread lack of knowledge being considered as a crucial factor for study. Howard and Maton (2011) also point to the dichotomous view of knowledge within educational research as either a psychological or social object of inquiry. Psychology views knowledge merely as information within people's minds, with a central focus on knowing; while Sociology views knowledge as a socially constructed reality reflective of dominant societal views (Howard & Maton, 2011). Howard and Maton (2011) believe that knowledge is both socially and epistemically constructed and thus exhibits its own properties, powers and tendencies. Knowledge-blindness, contend Howard and Maton (2011), with the central focus on characteristics of individuals rather than knowledge itself, results from disparate views of knowledge as either social or epistemic. Therefore, current models regarding educational technology integration, which highlight factors and relations to be explored, according to Howard and Maton (2011), are unable to unravel the underlying reasons behind them, due to their lack of consideration of underlying principles relative to the type of knowledge that is being taught and learned.

In order to investigate the underlying principles at stake in technology within formal education, Howard and Maton (2011) employed Legitimation Code Theory (LCT) as a means to compare a technology integration initiative within Australian secondary schools relative to the subjects of English and Mathematics. According to Howard and Maton (2011) the utilization of LCT highlights the central role played by knowledge when studying the apparent lack of success in relation to educational technology initiatives. Utilizing the LCT code of specialization, where someone or something is viewed as special and different, Howard and Maton (2011) differentiated between epistemic and social relations of knowledge in order to define knowledge and knower codes. These codes, according to Howard and Maton (2011), identify the rules of the game or the dominant basis for success within a specific social context. Knowledge codes, which are closely linked to epistemic relations, are characterized by an emphasis on the possession of specialized knowledge with attributes of people being less significant, whereas, knower codes are closely linked with social relations emphasizing the attributes of people, acquired either naturally or socially. Utilizing this framework, Howard and Maton (2011) defined the terms *code clash* and *code match* to describe the educational technology adoption or non-adoption that occurs when peoples' way of thinking and being are either in conflict or agreement with the educational policies and goals being pursued. As the social context continually changes, Howard and Maton (2011) recognized that codes do not stay stagnant over time and thus in response, the rules of the game may also be required to shift.

Results from Howard and Maton's (2011) research suggest that while all subjects and forms of knowledge are generally treated as homogenous in much of the educational technology research, in reality this may not be true. Initial quantitative findings from Howard and Maton's (2011) study

revealed that differences in teachers' use of technology depended solely on which subject was being taught,. However, subsequent qualitative data revealed that the degree of integration of technology in the classroom is not simply related to the subject area but rather to the "code underlying specific knowledge practices" of teachers (pg203). Based on their findings, Howard and Maton (2011) conclude that solid theoretical frameworks, which consider both knowledge and knowledge practices, may provide the resources necessary to unravel the unanswered questions and bias claims of the past.

It is evident from the literature cited regarding the guiding principles of educational technology as a discipline, that both pedagogic constructivism and the lack of focus on the importance of knowledge have shaped the psychological and pedagogical views within educational technology. With Constructivism as an educational technology goal, many researchers claim that promises of educational technology benefits have been inhibited by various factors (Wang & Reeves, 2003). Wang and Reeves (2003) identify teachers as one of the primary factors inhibiting integration of technology. Based on their research on teachers' curriculum implementation practices, Hoadley and Ensor (2009) point out that teachers are not simply resistant to change, as new curricula may require teachers to transform their pedagogical practices by shifting their ways of thinking, reasoning and speaking about knowledge and learners. One would assume that similar shifts would be required by teachers, if they are to change their pedagogical practices to gain from the benefits of educational technology. Given this insight, and Cuban's (1986) contention that promises of educational technology have been largely unfulfilled due to "existing cultural beliefs about what teaching is, how learning occurs, what knowledge is accepted in schools and the teacher-learner relationship" (Cuban, 1993, pg185), it is important to understand how different teachers conceive of learning, pedagogy and knowledge and whether their orientations to these issues have implications for the form and level of their adoption of educational technology . Hoadley and Ensor's (2009) concept of Professional Dispositions, which is grounded in Bernstein's theory of curriculum and pedagogy, and Bourdieu's concept of dispositions, offers a promising means of investigating the grounds for teachers' choosing whether or not to integrate educational technology in the classroom.

2.2 Professional Dispositions

According to Hoadley and Ensor (2009), the construct of 'Professional Disposition' connotes "how teachers think and speak about their subject knowledge, learners, pedagogic practice and the relationship between themselves and their learners" (pg2). The foundation for this concept is drawn from Bourdieu's (1974) notion of dispositions. Bourdieu (1974) defines *disposition* as established orientations to thinking and acting constructed within a social context, wherein people see and act accordingly to the world around them. Hoadley and Ensor (2009) contend that while people's classification and assessment inclinations or ways of viewing the world are socially acquired, manifestations of these propensities are evident within opinions and outlooks of individuals and their

practices. To explicitly deal with the role of teachers within the educational field, Hoadley and Ensor (2009) utilized Bernstein's (2000) language of description for curriculum and pedagogy, and affixed the word 'professional' to Bourdieu's (1974) original notion of disposition. In order to understand how the concept of Professional Disposition builds on Bernstein's language of description, it is necessary to explore Bernstein's theory of pedagogic discourse.

2.2.1 Bernstein's Language of Description for Curriculum and Pedagogy

2.2.1.1 Instructional and Regulative Discourse

Bernstein (1986, 1996, and 2000) developed a theory of curriculum, then a theory of pedagogy and then of knowledge to address questions in the sociology of education, particularly in relation to social class and educational access. Although the study does not address the issue of social class, because of its focus on private schooling and hence, middle class learners and teachers, Bernstein's theory of pedagogic discourse, however, provides a very powerful language of description for systematically describing and investigating any curriculum or pedagogic issues. In order to recognise teachers' Professional Dispositions, relative to their pedagogic interpretations and practices, this study employs Bernstein's theory of pedagogic discourse in the field of reproduction. Pedagogic discourse is a collection of rules which control the transmission or acquisition of systematic knowledge taught in schools and includes a means of systematically describing both content transmitted by teachers and the methodology employed by teachers for its transmission (Morais, 2002).

Bernstein (1986) defines the content of the pedagogic discourse as constituted of two analytically distinct but interrelated discourses, *instructional* and *regulative*. Singh (2002) characterizes the instructional discourse as a discourse of competences, related to the rules generating a discipline and its specific knowledge; and the regulative discourse as one which generates social order in relation to the rules for appropriate behaviour, character and approach of both teacher and learner within the classroom. The instructional discourse, Morais (2002) asserts "refers to what is being transmitted" (pg560), while the regulative discourse is a "discourse of order which translates the dominant values of society and regulates the form of how knowledge is transmitted" (pg560). Neither the instructional nor the regulative discourse alone shapes teachers' pedagogic practices but rather, claims Bernstein (1996), it is their combined product that dictates the transmission of specific knowledge or skills, embedded within a particular, regulative moral order (Hoadley & Muller, 2010). Neves and Morais (2001) contend that the prevailing moral order is purely a reflection of the dominant principles governing a society at a particular point in time.

2.2.1.2 Classification and Framing

Any pedagogic practice, according to Bernstein (2000), is generated from the same fundamental rules but may vary in strength in relation to knowledge boundaries between subjects and power relations,

and boundaries between teachers and learners. Bernstein (1971) has constructed different educational knowledge codes in order to describe these variations within the three 'messages systems' of curriculum, pedagogy and evaluation by employing the concepts classification and framing.

Classification refers to the 'what' of the pedagogic discourse and deals with the power relations that shape the "strength of the boundaries or degree of insulation between discourses" (Bernstein, 2000, pg6). These symbolic boundaries, constructed by teachers, relate to what knowledge and boundaries are considered valid (Hoadley & Ensor, 2009). Scott (2007) claims classification exists on a continuum from strong to weak, with strong classification enabling the development of specialised knowledge, whereas weak classification weakens the 'voice' or specialisation of the subject. Framing refers to the 'how' of the pedagogic discourse and deals with the 'locus of control', from several perspectives. Firstly, in relation to "the way in which knowledge is selected, sequenced, paced and evaluated in the classroom" (Hoadley & Ensor, 2009, pg2) and secondly, in relation to the style and nature of teacher and learner communication (Hoadley & Ensor, 2009). Framing, like with classification, exists on a continuum from strong to weak. A strong frame enables the teacher to exert more control over the sequence of information presented, the time allowed or allocated to each section as well the style in which information is transmitted to learners; a weak frame allows teachers limited control over the "selection of items and the way it is organized in respect of the pedagogical relationship" (Scott, 2007, pg77).

Utilizing the relative strength and weakness of classification and framing, Bernstein (2000) defined two different codes, *collection* and *integrated*. Collection codes, which generally involve long socialisation in order to develop more specialised knowledge, exhibit relatively strong framing and classification, whereas integrated codes exhibit relatively weak classification and framing and tend to blur boundaries between subjects, as well as frequently blur the boundaries between everyday and school knowledge (Morais, 2002). Morais (2002) claims that teachers' pedagogic practices, which consist of both the instructional and regulative discourses, are in reality simply an actualization of their coding orientation in relation to the strength or weakness of the classification and framing within their pedagogic discourse.

Although the concepts of classification and framing provide a means by which the strength of boundaries and power relations of teachers relative to their subject knowledge and their learners can be examined, it is still necessary to explore the fundamental elements in relation to 'what' and 'how' subject knowledge is being taught within the classroom. Therefore one needs to think about the way in which the 'what' of knowledge, the instructional discourse, and the 'how' of pedagogy, the regulative discourse, can be described. The study has employed Bernstein's (1999, 2000) view of the knowledge structures, as vertical and horizontal, to deal with the 'what' of knowledge being transmitted and

Bernstein's pedagogic modes (2000) of performance and competence to address the power relations in the classroom. Knowledge structures will now be considered.

2.2.1.3 Horizontal and Vertical Knowledge Structure

The instructional discourse, as discussed previously describes the 'what' being taught and encompasses how teachers perceive their subject's knowledge structure as well as subject specific procedures (Bernstein, 2000). Bernstein (2000) described strongly classified knowledge as a collection code, and weakly classified knowledge characterised by weak boundaries as an integrated code. Utilizing this language of description, Bernstein (2000) distinguished between two pedagogic modalities on either end of a continuum, shaped by teachers' positions in relation to the structure or degree of knowledge specialisation, referred to by Bernstein as horizontal or vertical knowledge structures. Bernstein (2000) constructs his conception of vertical and horizontal knowledge structures based on his argument that school and everyday common sense are dissimilar and diverse.

According to Bernstein (1999, 2000), everyday, 'common sense', horizontal knowledge, is weakly classified and framed. This form of knowledge is usually oral in nature and is characterized as "local, context-dependent, specific, tacit and multi-layered" (Bernstein, 2000, pg157) knowledge. The most critical feature of this knowledge form is that it is segmentally arranged and differs in relation to the manner in which specific cultures segment and highlight certain activities and practices (Bernstein, 2000). The circulation of knowledge within in this discourse is not necessarily related to one correct strategy, but rather, is an accumulation of experience within a specific context and community (Bernstein, 2000). Vertical discourses, on the other hand do not have knowledge that is segmentally organized or culturally dependent, but rather consists of "specialized symbolic structures of explicit knowledge" (Bernstein, 2000, pg160).According to Bernstein, all school knowledge is vertical and thus requires hierarchical sequencing and progression.

Bernstein (2000) further differentiates between two forms of vertical discourses, defined as horizontal and hierarchical knowledge structures as well as the manner in which changes to these different structures transpire. Horizontal knowledge structures consist of a collection of specialized languages and modes of interrogation. Development within this structure results in the introduction of a new language with the "possibility of a fresh perspective, a new set of questions, a new set of connections and problems and most importantly a new set of speakers" (Bernstein, 2000, pg162), which may be utilized to challenge the legitimacy of current practice. Alternatively, hierarchical knowledge structures "create very general propositions and theories, which integrate knowledge at lower levels" (Bernstein, 2000, pg161). Change within this structure emerges when attempts are made to disprove or integrate evolving or new propositions (Bernstein, 2000).

While the nature and form of pedagogy practiced by teachers within an instructional discourse may well be shaped by their view of knowledge structure in which their discipline resides, the discourse chosen by a teacher is often not solely dependent on this factor. The regulative discourse, the 'how' of pedagogic practice, must therefore also be explored.

2.2.1.4 Performance and Competence Pedagogic Modalities

Pedagogic modality, defined by Bernstein (1996) as the regulative discourse and by Hoadley and Ensor (2009) as the way in which learners are organized for learning and the manner in which knowledge is transmitted, is shaped by the strength of framing present within teachers' pedagogic practices. Bernstein (1996) defined two types of pedagogic modalities, *performance* and *competence*. On the one end of the continuum, Bernstein (1996) positioned Performance pedagogic modalities characterised by strong framing, and at the other end, characterised by weak framing, Bernstein (1996) positioned Competence pedagogic modalities.

Using this as a foundation, Naidoo (2011) identified three core elements that could be observed with regards to teachers' authentic pedagogic practice, as a means for a more nuanced understanding of the factors shaping teachers' views of their regulative discourse. The first core element termed by Naidoo (2011) as hierarchical rules, addresses the natural asymmetrical power relations that exist between teacher and learner. Competence pedagogical modalities characterized by weak framing (Bernstein, 1996) according to Naidoo (2011), exhibit more obvious learner-control with apparent symmetrical power relations present between teacher and leaner. On the other hand, Competence pedagogical modalities typified by strong framing (Bernstein, 1996) are associated with teacher-centred control and asymmetrical teacher-learner power relations (Naidoo, 2011).

The second core element, labelled by Naidoo (2011) as sequencing and pacing rules, deals with the locus of control in relation to the order in which knowledge is presented and the pace at which it is the acquired. Typical within competence pedagogic modalities is a strong dependency on learners, their features and their specific contexts, for the choice texts and pedagogic practices employed (Bernstein, 1996). On the other end of the continuum, a Performance pedagogic modality typified by strong teacher control, characterised through strong framing, results in authority with regard to content selection, sequencing and pace of instruction residing with the teacher (Bernstein, 1996). Bernstein (1996) further asserts that as Performance pedagogic modalities are based on specialized subjects, skills or procedures: within this modality it is possible to realize the transmission of knowledge explicitly through texts. However the possibility of pre-packaged textbooks, within a competence pedagogic modality, is limited due to alignment of texts catered to the features of individual learners (Bernstein, 1996).

The third core element, criteria rules, relates to the practice through which what counts as legitimate recognition and production of epistemic and social relations is realised (Naidoo, 2011). Typical of Performance pedagogic modalities is the acquirer's specific output, which is a consequence of specialized skills developed with a particular purpose in mind. Within this modality output is graded and learners are stratified according to these results (Bernstein, 2000), whereas competence pedagogic modalities are typified by teachers who view differences between acquirers as complementary rather than a justification for stratification and grading, with the fundamental characteristic being the focus on learners as active participants (Christie, 2008).

Having reviewed the literature germane to Bernstein's language of description in relation to pedagogic practice, Hoadley's and Ensor's (2009) construct of Professional Dispositions and the methodology they employed, can now be discussed.

2.2.1.5 Professional Disposition Revisited

Having introduced Bernstein's language of description for researching curriculum and pedagogy and Bourdieu's (1974) conception of dispositions, I can now return to the concept of Professional Disposition.

The construct of 'Professional Disposition', as defined by Hoadley and Ensor (2009) relates to teachers' orientations to learning, to learners, to the relationship between teachers and learners, and their conceptions of the nature of knowledge to be taught and acquired. It is therefore both a theory of instruction containing assumptions made by teachers in relation to children, how they learn and the subject knowledge to be transmitted and acquired (instructional discourse); as well as a theory of regulation relative to teachers' conceptions of what the relationship between learner and teacher should be relative to appropriate conduct, character and manner in the classroom (regulative discourse). Hoadley and Ensor (2009) investigated the instructional discourse by analysing the manner in which teachers spoke about learners, learning and knowledge, with regard to boundaries of their subject knowledge and learners, through degrees of classification (Bernstein, 2000). In addition to evaluating boundaries in relation to knowledge, Hoadley and Ensor (2009) analysed how teachers spoke about their subject, as well as their opinions as to the specialisation required by their subject, either as horizontal and vertical knowledge (Bernstein, 2000). In relation to the regulative discourse, Hoadley and Ensor (2009) investigated several facets relative to control within these boundaries, through degrees of framing (Bernstein, 2000). In relation to the hierarchical nature of the relationship in the classroom, factors such as pacing, sequencing, selection and pedagogic practices were explored. Concerning learners, how teachers believe people learn, justification and selection of potential resources, visions of the ideal learner, as well as observations of teachers interactions with learners were utilized. Hoadley and Ensor (2009) concluded that teachers' responses focused on either the

inner cognitive, psychological aspects of the learner and resources, characteristic of Bernstein's (2000) Performance pedagogy; or on the outer, non-cognitive, sociological aspects of the learner and resources, characteristic of Bernstein's (2000) Competence pedagogy. The choice of a Competence mode premised on discovery learning, according to Bernstein (2000), is a consequence of believing learners have built in competences.

The literature reviewed in relation to curriculum, pedagogy and Professional Dispositions offers resources to investigate and describe the nature of teachers' pedagogic discourses and the factors that shape them. Although teachers' Professional Dispositions characterized by their orientations to pedagogic practice may be essential in understanding adoption behaviours, as stated in the objectives and personal rationale for the study, I am interested in teachers' tablet adoption behaviour and therefore need resources to enable a further investigation in relation to technology adoption relative to teachers' orientations to teaching, learning and knowledge.

2.3 Orientation towards Tablet Technology

In order to offer insights into teachers' Orientation towards Tablet Technology (OTT), various framework in which the complexity of the relationship between technology and teaching were investigated. Firstly, within the field of information technology acceptance research, the UTUAT model (used within the broader umbrella research into the use of tablets in education) devised by Venkatesh et al., (2003), which combines a variety of competing technology adoption models, was considered. Although this model provides a "useful tool to assess and manage the likelihood of success for new technology introductions and assists in understanding the driver of technology acceptance" (Venkatesh et al., 2006, pg430), it does not provide a language by which different levels of technology adoption can be described, nor does it specifically focus on an educational context. Secondly, the Technology Pedagogical Content Knowledge (TPCK) framework, which specifically addresses the relationship between education and technology was investigated. The TPCK, developed by Mishra and Koehler (2006), provides a framework that enables one to make sense of "complex relationships that exist when teachers attempt to apply technology to the teaching of their subject matter" (pg1044). However it does not provide the language by which teachers' levels and manner of technology adoption can be described. Hooper's and Rieber's model of educational technology adoption (1995), in which different levels and manners of technology adoption within an educational context can be identified and described, in conjunction with Bernstein's (2000) conception of horizontal and vertical knowledge structures, is the conceptual lens through which teachers' Orientation towards Tablet Technology can be examined

2.3.1 Levels of Adoption

As discussed previously, advocates for the adoption and use of digital technology premise their claims that technology is liberating for teachers as it assists and supports learning and teaching within the classroom, on widespread popular opinions and constructivist pedagogic views (Jaffer, 2010; Hooper & Rieber, 1995). Fuelling these claims, proponents for the integration of educational technology contend that past educational technology reforms have resulted in technology being used as simply a support for traditional classroom activities (Cuban, 1986; 1993). Hooper and Rieber (1995) argue that educational technology should rather be a means by which to "apply ideas from various sources to create the best learning environment possible for learners" (pg154).

To assist in further understanding the levels of technology adoption in the classroom, Hooper and Rieber (1995) developed a model by which Levels of technology Adoption (LA) could be considered. It is important at this point to note two significant core beliefs that have shaped Hooper's and Rieber's (1995) views in constructing their model. Firstly, Hooper and Rieber (1995) position their model inside the dominant view prevalent within contemporary educational technology of pedagogic constructivism as preferable. Secondly, Hooper and Rieber's (1995) model is a stage-model in which teachers need to pass from the lowest to the highest stage in a sequenced order, with the highest stage anchored by pedagogic constructivism and learner-centred views (Hooper and Rieber, 1995). The model is prescriptive in nature in so far as failure to follow the sequenced path would be seen, as in the past, to result in educational technology either being used incorrectly or discarded (Rieber & Welliver, 1989). Notwithstanding these limitations mentioned, levels of educational technology adoption, as defined within Hooper's and Rieber's (1995) model, provides a means by which teachers' accounts of their differing levels of technology adoption can be described.

The model is comprised of five stages defined by Hooper and Rieber (1995) as Familiarization, Utilization, Integration, Reorientation and Evolution. Familiarization is concerned with a teacher's initial exposure to and experience with the technology. In this phase, the issues of 'how to' use the technology are addressed (Hooper & Rieber, 1995). The second stage, Utilization, occurs when the teacher "tries out the technology or innovation in the classroom" (Hooper & Rieber, 1995, pg156). Hooper and Rieber (1995) advocate within this phase, that teachers change their pedagogic modalities to more learner-centred and constructivist pedagogy in order to secure their effective and long term adoption. In contrast to Hooper and Rieber (1995), it should be clear from the preceding sections that an advocacy position for a Constructivist pedagogy as a basis for educational technology use, will not be adopted in this study.

The third stage, Integration, is where teachers consciously decide to utilize the technology and the technology is seen as indispensable to the educational process and if removed or unavailable, the

teacher will be unable to proceed. Hooper and Rieber (1995) claim that this stage signals the beginning of understanding by teachers, as to the value and use of technology in the classroom. Within the fourth stage, Reorientation, teachers may choose to reconceptualise and re-evaluate their pedagogic practice via examining their purpose and function in the classroom (Hooper & Rieber, 1995). Hooper and Rieber (1995) believe that teachers within the reorientation stage, do not feel threatened about being replaced or embarrassed by the technology or the learners, but rather view technology as a tool that needs to be explored. The final stage, Evolution, according to Hooper and Rieber (1995), provides the foundation from which teachers can examine new technologies as one of the possible resources that can enable relevant learning and teaching within a school context.

2.3.2 Manner of Adoption

The technological age within which we live is increasingly promoting the use of mobile technologies in all aspects of everyday life. Within an educational context, educational technology advocates assert that it is no longer sufficient to use traditional 'chalk and talk' pedagogies but rather teachers should embrace the use of technology within the classroom (Hooper & Rieber, 1995). Hooper and Rieber (1995) use this view as a springboard from which to describe two different types of technology use within education, Product and Idea technologies. Hooper and Rieber (1995) describe Product technologies as those technologies usually associated with the use of traditional and contemporary audio-visual equipment, as well as print based material and computer software. Examples may include video clips, digital presentations, video and voice recordings, desktop computers, books, worksheets and Computer based instruction (Hooper & Rieber, 1995). Idea technologies, on the other hand, according to Hooper and Rieber (1995) do not have tangible forms, but are rather "represented in or through some product technology" (pg158), with the idea driving the use of a specific tool or technology, not the reverse.

Hooper and Rieber (1995) illustrate the difference between these two manners of adoption by means of the hand-held calculator. Hooper and Rieber (1995) argue that while using hand-held calculators within classrooms today is certainly at the integration phase, whether the calculator is viewed as a product or an idea technology, will depend solely on the teacher's use of it. Hooper and Rieber (1995) claim that if the teacher continues to employ almost similar instructional strategies, as prior to the calculator being introduced, it is likely that the teacher's adoption of this technology will end at integration as "nothing much has changed or improved other than the mode of delivery" (Hooper & Rieber, 1995, pg159). Therefore, according to Hooper and Rieber (1995), the calculator will be defined, within this context, as a product technology. However, if the teacher focuses on how the calculator can empower and enable learners to better understand the mathematical problem being tackled, the calculator can be defined as an idea technology, with the possibility of reaching a partnership between how the product and idea technology can assist and enable learning (Hooper &

Rieber, 1995). Hooper and Rieber (1995) judge the ineffective or inefficient use of technology solely on the teacher's manner of adoption. Hooper and Rieber (1995) contend that it is not the tool that determines whether the technology is a product or idea innovation but rather the teacher. Therefore, understanding teachers' Professional Dispositions may provide the essential component required to truly appreciate teachers' technology adoption behaviours.

As mentioned previously, Hooper and Rieber (1995) reject the notion of behavioural or performance modalities of instruction and thus view the distinction between these different applications of technology as crucial in unravelling the apparent past failures of educational technology due to the sole focus on product technologies, which have disseminated traditional pedagogical views and beliefs within formal education. The distinction between Product and Idea technologies is being employed within this study simply as a means to identify different manners of adoption of educational technology use rather than to formulate a judgement as to nature of either as 'good or bad' (Jaffer, 2010).

2.3.3 Adoption Activity

In addition to the LA and MA, the types of activities that teachers utilize and envisage using tablet technology in the classroom, may provide a more multidimensional way through which to identify teachers' Orientation towards Tablet Technology. Many of those advocating the use of educational technology in the classroom have reported non-uniform adoption of technology across the teaching profession (Wang & Reeves, 2003), which they claim has often resulted in small and insignificant improvements within a formal education, notwithstanding the enormous waves of investment in technology (Cuban, 1986, 1993). Within my initial research, teachers reported that tablet technology is being used within the classroom for a variety of activities. Some teachers' reported that their current or envisaged Utilization of tablet technology was related to enhancing their everyday lives, for example, accessing relevant information and communicating with their learners or their peers; others reported more specialised use of tablet technology to enable the building of systematically, structured school related knowledge and enhance their current pedagogic practices (Sackstein & Spark, 2012).

Drawing on Bernstein's language of description in relation to horizontal and vertical knowledge structures, I have developed an additional three categories to enable me to capture Adoption Activities. Teachers' accounts of their Horizontal proficiency (AA-H) being the most basic activity, defined as teachers ability to utilize tablet technology within their everyday, horizontal lives to perform weakly classified and non-school related tasks (Bernstein, 2000). Current (AA-C) and envisaged (AA-E) accounts of pedagogical activities, the next level, are dependent on teachers' horizontal proficiency or familiarization and utilization (Hooper & Rieber, 1995) of the tool, as unless teachers are able to use the tablet technology in a horizontal manner, it is unlikely that they will be

able to adopt it in the classroom context. Within this study, teachers accounts of current and envisaged pedagogic activities will be described separately as expectations, or rather the manner in which teachers envisage utilizing the technology, may differ significantly from their current accounts of use (Sackstein & Spark, 2012). Current pedagogical activities refer to teachers' accounts of the tangible activities and tasks that they are currently using tablet technology for in the classroom. While envisaged pedagogical activities refer to teachers' accounts of those activities they would expect to use tablet technology for in the future. Hooper and Rieber (1995) argue that the type of activity that teachers use or would like to perform with tablet technology may be closely associated with their view of the technology as either a product or an idea innovation.

2.4 Conceptual Framework and Research Questions

Frameworks facilitate the identification of items worthy of attention in the phenomenon that we are studying, the consideration of relevant issues and provide a means of classification through which insights into the nature and relationship of the objects being studied can be investigated and described (Mishra & Koehler, 2006). The literature reviewed provides the theoretical foundation from which the conceptual framework has been constructed. This framework is intended to provide a more nuanced understanding of the decisions made by teachers, whether or not to adopt tablet technology within their pedagogic practices in relation to their PD and OTT. The conceptual framework (figure 1 diagrammatically represents the conceptual framework) has been developed with teacher's Professional Disposition (PD) and Orientation towards Tablet Technology (OTT) as central. As discussed in the literature presented, PD of a teacher is constituted through their pedagogic discourse, which is made up of an instructional (PD-I) and regulative (PD-R) component. The instructional discourse deals with the teacher's view their subject knowledge to be transmitted and acquired, as well as their theory of instruction, which may either be strongly or weakly classified (PD-IH or PD-IV). The regulative discourse, on the other hand, deals with the manner in which knowledge is conveyed, via different pedagogic modalities (PD-RP or PD-RC). These two components make up the PD of the teacher in the classroom. OTT within this study is based on Hooper and Rieber's (1995) technological adoption model in reference to the Levels (LA-F, LA-U, LA-I, LA-R and LA-E) and Manner (MA-I or MA-P) of Adoption, as well as different adoption activities (AA-H, AA-C and AA-E) drawn from the literature reviewed.

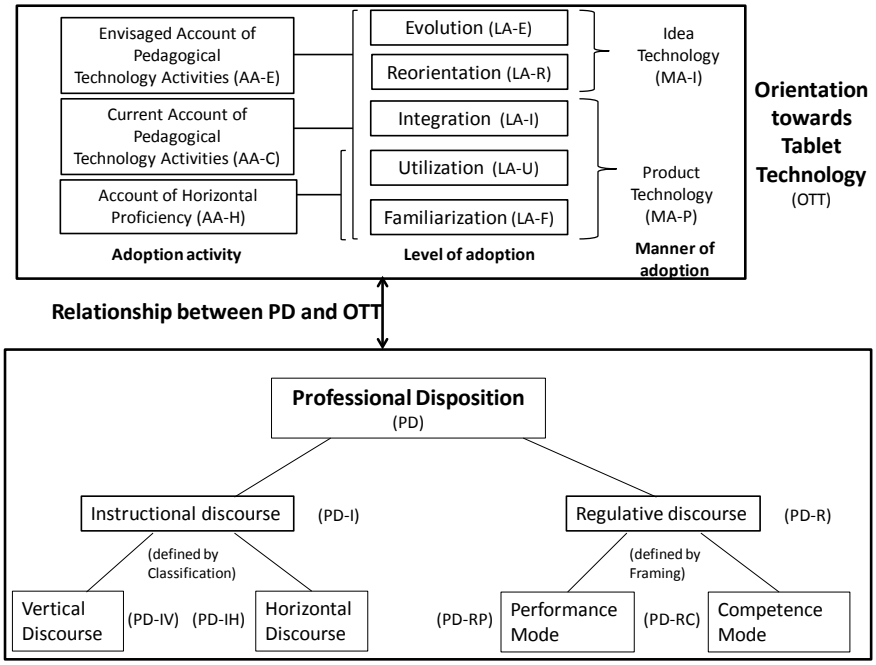


Figure 1: Conceptual Framework

Based on the above conceptual framework, the study intends to investigate **whether a relationship exists between teachers' Professional Dispositions and their level and form of adoption or non-adoption of tablet technology in the classroom**. In order to address this, the following sub-questions have been developed:

- *What are different teachers' Professional Dispositions?*
- *What are different teachers' orientations towards tablet technology?*
    - *How are teachers currently using tablet technology in the classroom?*
    - *How do teachers envisage using tablet technology in the classroom*
- *Is there a relationship between teachers' Professional Dispositions and their orientations towards tablet technology?*

On the basis of the questions above I should then be able to draw inferences as to:

- *Whether there are principled reasons*[1] *why teachers choose to adopt or not adopt tablet technology in the classroom?*

[1] *Principled* usually refers to only conscious decisions, however as I am trying to explain underlying relationships, in this research report I will use the term *'principled decision'* to refer to both conscious and unconscious decisions.

CHAPTER 3: RESEARCH METHODOLOGY

I am interested in understanding why teachers choose to adopt or not adopt tablet technology in the classroom. Using the conceptual framework defined in the previous chapter, this study intends to investigate *whether a relationship exists between teachers' Professional Dispositions (PD) and their Orientation towards Tablet Technology,* as well as how this relationship affects teachers' tablet adoption activities in the classroom.

The study employed an explanatory mixed methods design using surveys and interviews. The rationale for choosing a combination of quantitative and qualitative research methods is that they "complement each other and allow for a more complete analysis of the research problem" (Creswell & Clark, 2006, pg280). The explanatory research design enables the use of qualitative data as a means to explain quantitative findings, in which a broad level understanding or big picture of the research problem has been obtained (Creswell & Clark, 2006). According to Creswell and Clark (2006), explanatory research design requires data to be collected in two separate phases. Within this study, first quantitative data was collected and analysed and thereafter qualitative data. The advantage of this type of research design, claim Creswell and Clark (2006), is that it is straightforward to implement and can be carried out by a single researcher.

3.1 Research Method

3.1.1 First Phase

The first phase of the study consisted of an online survey in which teachers' Professional Dispositions (PD), their Orientation towards Tablet Technology (OTT) and the relationship between them were investigated.

Surveys, according to McMillan and Schumacher (2001), are an "assessment of the current status, opinions, beliefs, and attitudes by questionnaires or interviews from a known population" (pg602) which enable the measurement of the distribution and patterns of collected data. On the basis of the constructs developed in the conceptual framework an online survey (see Appendix A) was designed to elicit the how teachers view their subject matter (PD-I) in relation to classification of knowledge as well as how they view their pedagogic modality (PD-R), in relation to the framing of their discourse. In addition for OTT, teachers were asked to report on the types of activities they currently use (AA-C) and envisage (AA-E) using tablets for; the manner in which they perceive tablets are being used or will be used in the classroom (MA-P or MA-I); and their accounts of their levels of tablet technology adoption (LA). Survey questions were coded (see Table 1) in line with the constructs defined in the conceptual framework. Survey findings were used to test the conceptual framework and its defined

relationships (Palgrave, 2011) as well as to identify which areas required more in-depth, probing to facilitate a clearer understanding of the reasons for teachers' adoption behaviour.

Quantitative data within this study was collected through an online survey and was analysed by means of descriptive statistics of Median, Mode, Range and Inter-Quartile Range (Creswell & Clark, 2006). In order to gauge how respondents feel about technology adoption, the study used attitudinal Likert type scales which according to Creswell and Clark (2006) are a "very common and useful way to help researchers discover the strength of feelings or attitudes" (pg167) to measure the constructs of the conceptual framework (Creswell & Clark, 2006). Consistent with the objective of an explanatory research design, the analysis of the survey data has been used to guide the study as to distribution and trends of the broad issues being studied.

3.1.2 Second phase

The purpose of the interviews according to Creswell and Clark (2006), is that they allow one to "see the world through the eyes" (pg87) of the respondent. In the second phase, interview sessions were conducted with the teachers with the intention of uncovering the 'why' behind teachers' tablet technologies adoption decisions, as well as enabling a deeper understanding of the nature of the relationship between teachers' PD and OTT (Chen, 2010).

Interviews informed by the constructs of the conceptual framework and preliminary analysis of the survey findings (Maree, 2010) were semi-structured in nature with room for improvisation if needed (Myers & Newman, 2007). Myers and Newman (2007) cite many pitfalls associated with using interviews such as the artificial setting and intrusive nature of the interview; possible lack of trust between interviewer and interviewee; the potential for ambiguity of language and questions and possible inconsistent interviewee responses. The study has attempted to minimize these shortcomings mentioned. Interview questions were coded using *a priori* codes, developed before examining the data (Creswell & Clark, 2006). Interviews were then transcribed and content analysis "a systematic approach used to identify and summarise the message content of the interviews" (Creswell & Clark, 2006, pg101) was used to analyse the interview data.

3.2 Population and Sample

With the intention of obtaining the richest possible data (Creswell & Clark, 2006) this study used a purposive sampling method where "participants are selected because of some defining characteristic that makes them the holders of the data needed for the study" (Creswell & Clark, 2006, pg79). A stratified purposive sampling method was used, which according to Creswell and Clark (2006), requires participants to be selected according to preselected criteria relevant to a specific research question.

As this study aimed to investigate teachers' grounds for the adoption or non-adoption of tablet technology, only schools in which tablet technology is currently being used or piloted in the classroom were targeted. The population for this study has therefore been drawn from advantaged private secondary schools in the Gauteng region of South Africa which are at the forefront of active tablet technology utilization or pilot programmes, whereas the majority of government schools have not yet implemented tablet programs in their classrooms.

The study focuses specifically on grade 9 teachers. Private secondary education within a South African context is divided into junior and senior high school, with different assessments requirements for each. As senior high school is targeted towards the matric assessment, which is used as a primary means for entrance into tertiary education, schools are not willing to make major adjustments to their teaching within these grades, so as not to upset the status quo and jeopardize their learners' results. It is for this reason that Grade 9, which is the end of junior high school, is where the majority of tablet pilot programmes or implementations are being put into practice.

The manner in which tablet technology is introduced and used within an educational institution may affect teachers' choices as to their adoption or non-adoption. Based on my preliminary study into the use of tablets, at the present time it was found that the most frequent mode of implementation relative to tablet technology use within private secondary education, is 1:1 implementations where both teachers and learners are in possession of their own tablet device. Currently mobile classrooms, in which a classroom of tablets are shared between different teachers and learners and bring your own device (BYOD) programmes are also present within schools, but are not as widespread. The study does not address other tablet implementation.

Three schools were approached and all agreed to participate. Thereafter, an information session was held for all grade 9 teachers where the aims of the study and ways in which they could participate were explained (see Appendix C for information participation letter). Consenting teachers were then asked to take part in the online survey. In order to ensure that teachers unfamiliar with tablet technology did not self-select out of the online survey, teachers were given the option of completing a paper-based survey. Once teachers completed the survey, a minimum of four teachers from each of the three schools that had volunteered to be interviewed, were selected with the intention of maximizing teachers' differences in relation to their PD and OTT. An ideal sample would have included the same individuals for both phases of the study (Creswell & Clark, 2006). However, as the online survey was anonymous, it was impossible to match survey respondents with teachers interviewed.

3.3 Research Instruments

As mentioned previously, an explanatory research design draws on broad findings from the first phase of data collection in order to inform and fine tune questions to be asked during the second phase (Creswell & Clark, 2006). Therefore this study made use of two different types of research instruments. Questions for each of the instruments were premised on the constructs of the conceptual framework and informed by the literature reviewed.

For the first phase of the data collection an online survey administered via Google Docs (Appendix A) was used. For the second phase, interview questions were formulated from the conceptual framework in conjunction with the responses from the online survey in which areas requiring further probing were identified (Appendix B).

3.4 Ethical Approval

Ethics approval was granted unconditionally for this study (protocol number H120314). Respondents were informed about the nature of the study, their ability to withdrawal at any time, and time required to participate. In addition, confidentiality and anonymity was ensured; for the online survey, Google Docs provided for anonymous responses, and for the interviews, names of teachers interviewed were changed. Information participation letters and consent forms for this study can be found in Appendix-C.

3.5 Data Collection and Analysis

As mentioned previously, phase one of the data collection was conducted via an online survey[2], with questions informed by the literature and coded accordingly. The survey link was provided to teachers during the information sessions as well as sent via email. The survey was open for responses for a three week period and teachers were reminded via email during that time to complete the survey. Once the survey was closed for responses, results were downloaded and sorted into a spreadsheet and analysed by the means of descriptive statistics. The decision to use descriptive statistics within this study to "enhance the understanding of the properties of the data" as well as "organise and summarise data in a meaningful way" (Creswell & Clark, 2006, p183) is aligned with the objectives of an explanatory study in which quantitative findings identify broad issues that require further investigation.

Using the preliminary survey findings to inform interview questions, interviews were conducted with teachers in phase two of the data collection. As the purpose of the interviews was to provide more

[2] As mentioned previously teachers were given a choice at the information session to complete a paper survey but this option was not requested at any of the schools.

differentiated insights into teachers' PD and OTT, teachers interviewed were selected to provide the widest view of the constructs in the conceptual framework. Interviews were held with individual teachers at each of the schools and lasted between 25 and 40 minutes. All teachers consented to their interview being recorded. All interviews were transcribed by the researcher and then checked by a third party to ensure the accuracy of the transcription.

3.6 Quality Criteria

3.6.1 Trustworthiness

Trustworthiness is essential when applying a mixed research methodology as it ensures that findings are reliable and dependable. These measures of quality ensure that findings are free of researcher bias as well as an accurate account of the data. To ensure trustworthiness of the data and to provide reliable findings, survey and interview data collected was triangulated to "search for common themes" (Creswell & Clark, 2006, pg299) and identified themes were discussed with the participants.

3.6.2 Validity

According to Creswell and Clark (2006) internal validity or credibility refers to the degree to which the research instruments accurately measure what it was meant to measure, it is the "assurance that the researcher's conclusions stem from the data (Durrheim & Wassenaar, 2002, pg299). However, in the human sciences this may be problematic, as measuring human responses are often unreliable and erratic (Creswell & Clark, 2006). To ensure internal credibility, the survey instruments was checked by the researcher's supervisor as well as piloted on a number of teachers to ensure it was measuring what it was intended to measure. In addition, confirmatory questions were included to guard against respondents that "may tend to agree or answer yes to all questions" (Creswell & Clark, 2006, pg218).
External validity or transferability, which refers to the "way in which the reader is able to take the findings and transfer them to other contexts" (Durrheim & Wassenaar, 2002, pg300), has been ensured in this study, as large amounts of clear and detailed information and "rich, thick descriptions" (Creswell & Clark, 2006, pg300) have been drawn from the interview transcripts (Appendix D).

3.7 Coding of Constructs

Constructs informed from the literature and depicted in the conceptual framework formed the foundation from which questions for both the survey instrument and interview questions were derived. As mentioned previously, an *a priori* coding scheme was used based on preset codes developed in the conceptual framework (Creswell & Clark, 2006).

Construct	Conceptual Definition	Coding Definition
Professional Disposition (PD)	"How teachers think and speak about their subject knowledge, learners, pedagogic practice and relationships between themselves and learners" (Hoadley & Ensor, 2009, pg2) "The way in which learners are organized for learning and the kind of knowledge distributed to them" (Hoadley & Ensor, 2009, pg2)	***Instructional Discourse and Instructional Strategies*** **(PD-IH or PD-IV)** • Nature of the knowledge either as horizontal and everyday or as vertical and school knowledge (Bernstein 2000) • Extent to which knowledge is specific to the discipline or draws on everyday knowledge or teacher experience (Hoadley & Ensor, 2009) AND ***Classification (C+ or C-)*** • Boundaries of knowledge • Relationship between teachers and learners (Bernstein, 1999 and Hoadley & Ensor, 2009) ***Regulative Discourse and Instructional Form*** **(PD-RP or PD-RC)** • Manner in which pedagogy is transmitted to learners (Bernstein 2000) • How learners are grouped • How knowledge is differentiated to learners (Hoadley & Ensor, 2009) AND ***Framing (F+ or F-)*** • Control of boundaries between the teacher and learner • Nature of power relations between teachers and learners and control in the classroom in relation to sequencing, selection and pacing (Bernstein, 1999 and Hoadley & Ensor, 2009)
Orientation towards Tablet Technology (OTT)	Teachers' applications of technology within an educational context (Hooper & Rieber, 1995)	***Levels of Adoption*** **(LA-F; LA-U; LA-I; LA-R; LA-E)** ***Familiarization (LA-F)*** • Initial exposure to and experience with the technology • 'How to use' the technology is addressed ***Utilization (LA-F)*** • Technology is tried out in the classroom ***Integration (LA-I)*** • Teacher consciously decides to use the technology • Technology is seen as indispensable to the educational process

	"The role and value of technology and how it supports beliefs and practices of classroom teachers" (Hooper & Rieber, 1995, pg158) How the teacher currently uses or envisages using tablet technology (Bernstein, 1990, 1996, 200 and Hooper & Rieber, 1995)	***Reorientation(LA-R)*** • Teachers may reconceptualise and re-evaluate their pedagogic practice • Examine their purpose and function in the classroom ***Evolution (LA-E)*** • Examine new technologies as a possible resource to enable relevant learning (Hooper & Rieber, 1995) ***Manner of Adoption*** **(MA-P or MA-I)** ***Product Innovation (MA-P)*** • Technology innovations associated with traditional pedagogic practices ***Idea Innovation (MA-I)*** • Represented in or through some product technology • Idea drives the use of the specific tool (Hooper & Rieber, 1995) ***Adoption Activity*** **(AA-H, AA-C and AA-E)** ***Horizontal Proficiency (AA-H)*** • Teachers being able to utilize table technology in their everyday lives • To perform weakly classified, non-school related tasks ***Current account of pedagogical activities (AA-C)*** • Dependent on horizontal proficiency • Tangible activities currently reported being performed with tablet technology ***Envisaged account of pedagogical activities (AA-E)*** • Dependent on horizontal proficiency • Activities teachers would like to or expect to use tablet technology for in the future (Bernstein, 1990, 1996, 2000 and Hooper & Rieber, 1995)

Table 1: Coding of Constructs

CHAPTER 4: SURVEY ANALYSIS

This chapter analyses the survey data that was collected via an online survey administered to 3 private secondary schools with 1:1 tablet implementations. A total of 65 possible respondents were invited to complete the survey, and 46 responses were received. Although a very high response rate (70%) for online surveys of was achieved (Hamilton, 2003) due to the small sample size, the findings have not been used to make generalizations about the larger population but rather to gain insight into the broad issues affecting teachers' adoption of tablet technology in the classroom.

In order to perform the data analysis, responses were captured from the online database onto a spreadsheet and categorized according to the demographical information asked within the survey: subject taught, gender, age and years in teaching. As the demographic grouping of subject taught provided the most insights, this will be used as the primary method of presentation, but reference will be made to other groupings where interesting findings have been observed.

Questions related to each of the constructs being studied were grouped together and where a question related to multiple constructs, the question was repeated in the spreadsheet. An example of this relates to the construct Levels of Adoption (LA) in which the question *it is easy to use tablet technology to support my own teaching style* relates to both LA-F and LA-U. Confirmatory questions were included to ensure quality of the data (Creswell & Clark, 2006), but with privilege of hindsight it is possible that too many confirmatory questions were included and therefore not all of the 63 questions have been reported on in detail. Only questions that provided interesting insights or exposed inconsistencies within the findings will be discussed.

As mentioned in the research methods chapter, the objective of the survey was to give a broad overview of the relationship between constructs being studied, and therefore descriptive statistics, which offer a range of statistical methods by which data collected can be presented, in a manner which is quick to interpret, while at the same time highlighting issues for further investigation (Lazar, Feng & Hochheiser, 2010), have been used. The descriptive statistics used in the data analysis of the survey are the Median, Mode, Range and Inter-Quartile Range.[3] The Median and Mode, which are measures of central tendency, are useful when describing typical data points in data sets that potentially have extreme values (Creswell & Clark, 2006). The *Median*, showing the middle point of the data set, has primarily been used in the analysis of the survey data with *Mode*, the most common response, being

[3] While the initial analysis also included descriptive -statistics using the Mann-Whitney U test a non-parametric test used when group sizes are less than 30 to compare two independent groups based on a single variable (Creswell & Clark, 2006). Due due to the sizes of each subject grouping being less than 10, the findings did not appear to add any value to the survey analysis, and therefore were not included in this chapter.

used where appropriate. The Range and Inter-Quartile Range, which are helpful in understanding measures of dispersion, have been used to show the spread of data (National Atlas, 2013). The *Inter-Quartile Range*, describing the middle 50% of the data without outliers (Lazar, et al., 2010), has primarily been used. The *Range*, showing the difference between the highest and lowest scores within specific groupings including outliers, has been referred to where appropriate.

Detailed analyses are presented in this chapter by each of the constructs defined within the conceptual framework, and where appropriate, confirmatory questions will be reported together with the primary question[4]. Descriptive statistics, sorted by subjects as captured in the survey, are shown in a summary table at the beginning of each section and then commented on. Caveat lector: this is a very detailed analysis aimed at providing systematic evidence for the typologies I am developing for the constructs of Professional Disposition and Orientation towards Technology. Readers that do not want to track the detailed evidence can go directly to the summary tables: for PD: - tables 5, 12 and 13; for OTT: - tables 23, 32, 36, 42, 48, 49, 50 and 51; and for the relationship between PD and OTT: - tables 52 and 53. Descriptive values in the summary tables will be presented in ascending or descending order in order to show trends amongst the groupings. Due to small amount of data related to the age and experience categorisation, values will be reported in the paragraph description[5]. Questions phrased in the negative will be presented in the original form unless stated otherwise.

4.1. Professional Disposition

4.1.1 Instructional Discourse (PD-I)

4.1.1.1 Difference between Everyday and School Knowledge and Strength of Boundaries between them

In order to assess how teachers construe strength of boundaries between everyday and school knowledge and the relationship between them (Classification) the following statements were posed: (q1) *there are significant differences between the subject that I teach and everyday knowledge* and (q3) *the subject that I teach is directly related to learners' everyday knowledge.*

[4] In the survey analysis (chapter 4) verbs like 'perceive', 'construe', 'think', 'believe', 'account' or 'report' have been used, in the survey discussion (chapter 5) verbs like 'appears', 'seems' or 'imply' have been used to report on conclusions drawn from the survey analysis.

[5] Where no significance findings are evident from the grouping of teachers' age and experience, these factors have not been reported.

Subject	Number in Group (n)	Q1 Median Different to everyday	Q1 Mode	Q1 IQR	Q3 Directly related to everyday	Q3 Mode	Q3 IQR
Maths	10	**4.00**	4.00	1.00	**3.00**	3.00	0.75
EMS	5	**4.00**	3.00	1.00	**3.00**	4.00	**2.00**
Art	4	3.00	3.00	0.25	4.00	4.00	1.00
NS	4	3.00	3.00	0.50	4.00	4.00	0.25
SS	7	3.00	3.00	**1.50**	4.00	4.00	1.00
2nd Lang	7	3.00	4.00	**2.00**	4.00	4.00	0.50
English	9	**2.00**	1.00	1.00	4.00	5.00	1.00

Table 2: Summary of differences between Everyday and School knowledge (q1)[6] and Boundary strength (q3)[7] - Median, Mode and IQR Values

The majority of EMS and Maths teachers construe their subject as different from everyday knowledge, however, EMS[8] teachers are divided as to the strength of the boundaries between the everyday knowledge and the subject they teach. Maths teachers are also undecided in relation to boundary strength however, their views are more unanimous.

English teachers hold similar views in relation to their subject being similar to everyday knowledge and the weak boundaries between them. The large range within the English subject grouping in relation to the differences between everyday and school knowledge (q1RangeEng=4.00) indicates the presence of an outlier as opposed to largely diverse opinions. On analysis of detailed teacher responses, it is evident that one English teacher perceives everyday knowledge as significantly different to school knowledge and construes boundaries between these types of knowledge as strong, this is not the view held by the majority of teachers within this subject grouping.

Art[9], NS and SS[10] teachers are unsure as to whether there is a difference between everyday and school knowledge, however, they construe the boundaries between them to be strong. 2nd language[11] teachers also hold mixed views as to the difference between their subject and everyday knowledge.

Age and Experience

When grouping the data on the age of the teacher and years of experience, irrespective of subject taught, with regard to strength of boundaries between everyday knowledge and school knowledge, teachers with more experience in the 31+ category (n=5) perceive boundaries between the everyday

[6] For q1 a response of 4 or 5=suggests differences between everyday and school; 1 or 2=suggests little difference
[7] For q3 a response of 4 or 5=suggests weak boundaries between everyday and school; 1 or 2=suggests strong boundaries
[8] Although Accounting and Business Studies are grouped together under the learning area of EMS, they are different disciplines and require different skill sets.
[9] For the purpose of analysing the survey data in this study, all different forms of Art such as Visual Art, Dramatic Art and Music have been included in the same subject grouping, this may account for variations.
[10] While Biology and Science constitute the learning area NS and History and Geography constitute SS, it has been observed that they are indeed different disciplines that require different skill sets.
[11] The survey instrument conflated this subject grouping as it did not differentiate between 2nd languages, such as Afrikaans which is used within a South African context, and other additional languages such as French or Latin.

and their subject to be strong (q3Mode31+=2.00), whereas teachers with less experience in the 1-5 category (n=3) perceive boundaries between them to be weaker (q3Mode1-5=4.00). Large variations within the 1-5 year grouping (q3IQR1-5=1.50) indicate that diverse opinions are evident amongst less experienced teachers, which may be due to the variety of subjects taught by this group of teachers.

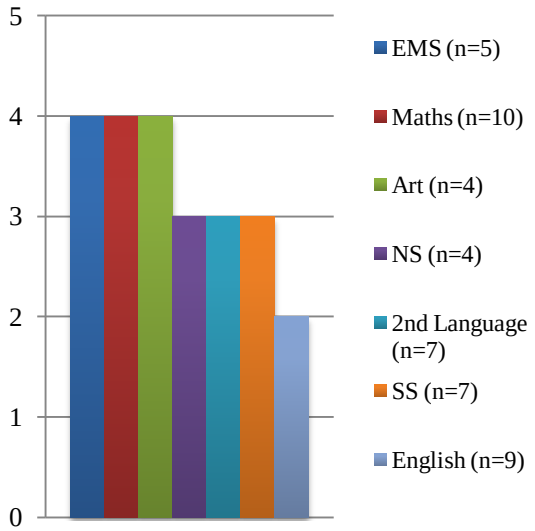


Figure 2: Subject teachers' views on differences between everyday and school knowledge (q1)

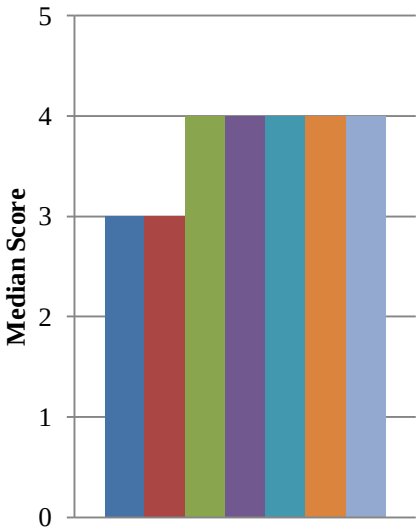


Figure 3: Subject teachers' views on boundary strength between their subject and everyday knowledge (q3)

4.1.1.2. Specialisation of Attitudes and the Nature of Tasks

In order to assess whether teachers perceive that their subject requires students to develop specialisation and whether tasks should be specialised or closely related to the everyday (Classification), the following statements were posed: (q2) *the subject that I teach requires learners to develop specialised attitudes*, (q4) *the use of everyday examples can block the development of understanding in my subject*, and (q5) *tasks learners do in my subject must be closely related to their everyday lives.*

Subject	Number in Group (n)	Q2 Median Special attitudes	Q2 Mode	Q2 IQR	Q4 Everyday can block	Q4 Mode	Q4 IQR	Q5 Tasks related	Q5 Mode	Q5 IQR
Art	4	5.00	5.00	0.50	1.00	1.00	0.50	**3.00**	3.00	0.25
NS	4	4.00	4.00	0.25	**3.00**	3.00	0.25	4.00	4.00	0.50
SS	7	4.00	4.00	0.50	2.00	1.00	**1.50**	4.00	4.00	1.00
2nd Lang	7	4.00	4.00	0.50	1.00	1.00	1.00	5.00	5.00	0.00
Maths	10	4.00	4.00	0.75	1.00	1.00	1.00	**3.00**	3.00	0.75
EMS	5	4.00	4.00	1.00	2.00	1.00	**2.00**	**3.00**	4.00	1.00
English	9	4.00	3.00	**2.00**	1.00	1.00	1.00	4.00	4.00	**2.00**

Table 3: Summary of specialisation of learners' Attitudes (q2)[12], the use of Everyday examples (q4)[13] and Tasks being related to everyday lives (q5)[14] - Median, Mode and IQR Values

[12] For q2 a response of 4 or 5 = suggests specialisation is; 1 or 2=suggests little or no specialisation.
[13] For q4 a response of 1 or 2=suggests everyday examples enhance understanding; 4 or 5=suggests everyday examples blocking understanding.
[14] For q5 a response of 4 or 5=suggests it is crucial that everyday examples be used to enhance understanding of school knowledge; 1 or 2=suggests that it is not necessary for tasks to be related to the everyday.

Teachers across all subjects perceive students need to acquire specialised attitudes in relation to their school knowledge, which may be suggestive teachers' general construal of pedagogy and school knowledge. The majority of all subject teachers, except for NS, indicate their use of everyday examples can enhance students' understanding of their subject, whereas in relation to learner tasks being closely related to their everyday lives, only Art (note 9), EMS (note 8) and Maths teachers appear unsure, all other teachers perceive they are related. A possible reason for Maths teachers appearing neutral is that a large part of school Maths in the higher grades is quite abstract and therefore examples related to the everyday may be perceived by teachers as an unnecessary aid to learning. For Art and EMS, a possible reason may be that these subjects are composed of different subjects, some which are related to the everyday and others which are more abstract

Varied perceptions evident amongst English, EMS and SS teachers in relation to specialisation of knowledge, are not due to the presence of outliers within these groups. This seems to indicate that grouping teachers on subjects may not be the most optimal way of categorisation in relation to specialisation of attitudes.

Age and Experience

In relation to the use of everyday examples as a means to assist understanding as well as the link between everyday life and student tasks, teachers in the 55+ age category (n=7) across all subjects held disparate views (q4Range55+=4.00, q4IQR55+-=2.00 and q5Range55+=4.00, q5IQR55+=2.00). Within years of experience, teachers with 31+ years of teaching experience (n=5) perceive learner tasks must be linked to their everyday lives (q5Mode31+=5.00), however diverse opinions are evident within this group (q5Range31+=4.00, q4IQR31+=2.00). Teachers with less experience (n=7) in the 1-5 year category, hold neutral views as to whether tasks should be linked to learner's everyday lives (q5Mode1-5=3.00).

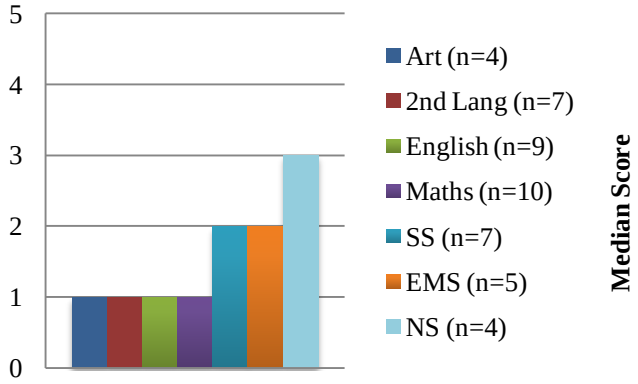


Figure 4: Subject teacher's views on everyday examples blocking understanding (q4)

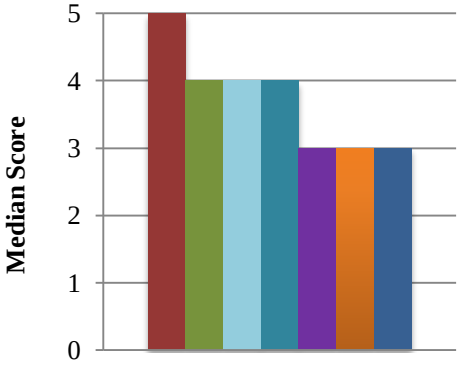


Figure 5: Subject teachers' views on school tasks being related to everyday life (q5)

4.1.1.3. Systematic Progression of Knowledge

In order to gauge how teachers construe the systematic acquisition of knowledge within their subject (Classification), the following statement was posed: (q6) *learners cannot learn new concepts or complete tasks in my subject unless they have mastered all the previous concepts taught.*

Subject	Number in Group (n)	Q6 Median Master Previous concepts	Q6 Mode	Q6 IQR
English	9	**2.00**	2.00	0.00
2nd Lang	7	3.00	3.00	1.00
SS	7	3.00	2.00	2.50
Art	4	3.50	3.00	0.88
EMS	5	4.00	3.00	1.00
NS	4	4.00	3.00	2.00
Maths	10	**4.50**	5.00	1.00

Table 4: Summary of the Systematic progression of knowledge (q6)[15]- Median, Mode and IQR Values

Maths, EMS and NS teachers perceive their subjects require systematic knowledge acquisition, whereas English teachers construal of knowledge within their subject is that it does not necessarily need to be systematically acquired. Within the subject grouping of EMS and Maths, teachers hold similar views, whereas in the subject grouping of NS diverse opinions are evident (note 10).

Art, 2nd language and SS teachers are undecided in this regard, with largely diverse opinions evident within the subject grouping of SS (note 10). Outliers are evident within the grouping of English and Art (q6RangeEnglish=3.00, q6RangeArt=3.00).

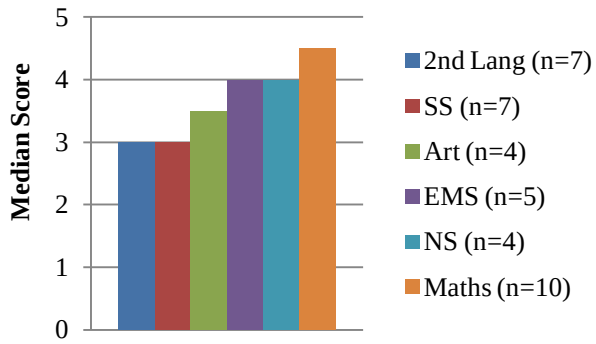


Figure 6: Subject teachers' views on Systematic progression of knowledge (q6)

4.1.1.4. Summary of Instructional Discourse (PD-I) - Classification

I am now in a position to construct a view of different subject teachers' perception of classification strength relative to their instructional discourse (PD-I). Median scores of each of the sub-sections were used as a guide to develop the scoring system seen in table 5. Median scores of 1.00-1.99 were scored

[15] For q6 a response of 4 or 5=suggests teachers agree that knowledge within their subject is systematically acquired; 1 or 2=suggests that horizontal knowledge acquisition can occur.

as very weak relationships (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as relatively strong (+); scores of 4.00 and above were scored as strong (++). Classification strength was calculated by the adding up all plus and minus signs and calculating the difference between the two[16].

Subject	Number in Group (n)	Everyday vs. School	Boundary Strength	Specialisation of Attitude	Use of Everyday Examples	Tasks linked to Everyday	Systematic Progression of Knowledge	Classification Strength
English	9	Same (C-)	Weak (C- -)	Strong (C++)	Essential (C- -)	Essential (C- -)	Not Needed (C-)	**Weak**
Art	4	Neutral (C)	Weak (C- -)	Strong (C++)	Essential (C- -)	Neutral (C)	Needed (C+)	**Weak**
SS	7	Neutral (C)	Weak (C- -)	Strong (C++)	Essential (C-)	Essential (C- -)	Neutral (C)	**Weak**
NS	4	Neutral (C)	Weak (C- -)	Strong (C++)	Essential (C)	Essential (C- -)	Essential (C++)	**Mixed**
2nd Lang	7	Neutral (C)	Weak (C- -)	Strong (C++)	Essential (C- -)	Essential (C- -)	Neutral (C)	**Mixed**
EMS	5	Different (C++)	Neutral (C)	Strong (C++)	Essential (C-)	Neutral (C)	Essential (C++)	**Strong**
Maths	10	Different (C++)	Neutral (C)	Strong (C++)	Essential (C- -)	Neutral (C)	Essential (C++)	**Strong**

Table 5: Teachers' Classification Strength

As seen table 5 English, Art and SS teachers perceive their subjects to be weakly classified, whereas EMS and Maths teachers perceive their subject to be strongly classified. NS and 2nd Language teachers have mixed views. In addition, the data suggests that all teachers no matter which subject they teach, perceive specialisation of attitudes in regards to school knowledge as essential. This may be related to how teachers generally feel about school knowledge being specialised (Mishra & Koehler, 2006).

4.1.2. Regulative Discourse (PD-R)

4.1.2.1 Group Work and Independent Research

In order to assess how teachers perceive the use of group work and independent research (Framing), the following statements were posed: (q7) *unless learners do independent research alone or in groups, it is difficult to learn my subject,* (q15) *group work is an essential part of learning in my subject* and (q16) *I seldom use group work in my subject.*

Subject	Number in Group (n)	Q7 Research and group work are important	Q7 Mode	Q7 IQR	Q15 Median Group work is essential	Q15 Mode	Q15 IQR	Q16 Median Group work is seldom used	Q16 Mode	Q16 IQR
Art	4	3.50	4.00	0.88	**4.00**	5.00	1.00	**1.00**	1.00	1.00
English	9	3.00	3.00	**3.00**	3.00	3.00	1.00	2.00	2.00	0.75
2nd Lang	7	3.00	3.00	1.00	3.00	2.00	**2.00**	2.00	2.00	1.00
NS	4	3.00	2.00	**2.25**	3.00	3.00	0.00	2.00	2.00	1.00
EMS	5	3.00	2.00	1.00	3.00	4.00	1.50	3.50	3.00	1.38
SS	7	**2.00**	2.00	1.50	3.00	3.00	1.00	3.00	2.00	**1.50**
Maths	10	**2.00**	2.00	1.00	**2.50**	2.00	0.88	3.50	3.00	**1.75**

Table 6: Summary of teachers' perception of Group work and Independent research: making learning easy (q7)[17], group work being essential (q15), infrequent use of group work (q16)[18] - Median, Mode, IQR

[16] Weak classification = more minuses; Mixed Classification= almost the same amount; Strong Classification=more pluses

[17] For q7 and q15 a response of 4 or 5=suggests a competence pedagogic mode; 1 or 2=performance pedagogic mode

[18] For q16 a response of a response of 4 or 5 suggests a performance pedagogic mode; 1 or 2 suggests a competence pedagogic mode.

Maths teachers perceive learners can still achieve in their subject without engaging in group work and independent research, and consequently do not view this as an essential pedagogic practice. Despite the fact that some Maths teachers use group work very infrequently, diverse opinions are evident within this subject grouping. A possible reason may be that within Maths, independent effort not group work is valued[19]. EMS and SS teachers also perceive that group work or independent research is not critical for learner achievement, nevertheless EMS teachers report they make use of it in their lessons and SS teachers are divided as to these types of pedagogic practices. Varied opinions amongst SS teachers may be due to combination of group work and independent research into one question within the survey instrument, because when asked about group work on its own, most SS teachers perceive group work to be an essential pedagogic practice, and report using it often.

Although Art teachers do not perceive students can progress in their subject unless they engage in group work and independent research, when asked about group work specifically, Art teachers do not construe this as an essential part of the pedagogic process. As mentioned previously a possible reason may be the combination of group work and independent research into one survey question. Diverse opinions are evident within the Art subject grouping, in relation to the frequency of group work in the classroom (note 9).

2nd Language teachers are unsure as to whether group work and independent research is essential within their subject, and report making use group work within their lessons on an occasional basis, however diverse opinions are evident within this subject grouping (note 11).

Age and Experience

When grouping the data on the age of the teacher and years of teaching experience irrespective of subject taught, the majority of older teachers in the 55+ year category (n=7) perceive group work and independent research as enablers to student progress (q7Mode55+=4.00). However disparate views present within this grouping (q7Range55+=4.00) seem to indicate that on its own age is not significant. Teachers in the 36-45 year category (n=19) believe group work is essential (q15Mode36-45=4.00) and use it frequently (q15Mode36-45=2.00), diverse views present within this age category (q15 and q16Range36-45=4.00) are due to the presence of an outlier. In relation to group work and independent research being seen as facilitating student progression, varied views are present within the grouping of least experienced teachers with 1-5 years of teaching experience (n=7) (q7Range1-5=4.00) and the most experienced teachers in the 31+ (n=5) year teaching experience category (q7Range31+=4.00). A possible reason for this may be that teachers within these groupings hold

[19] This insight is based on Howard's and Maton's (2011) study in which the pedagogic practice of Maths was studied.

strong opinions, either based on large amounts of experience or recent teacher training (National Center for Education Statistics, 2000).

Summary of Group work and Independent Research

To construct a composite score that may offer a more unified view of the relationship between different subject teachers' view on using a combination of group work and independent research in their teaching, the median score for group work and independent research (q7) was used. For the use of group work alone, a combined median score for q15 & q16 was used. As q16 was phrased in the negative, the median scores for this question were reversed. Median scores of 0-2.99 seem to imply teachers perceive this type of pedagogic practice as not essential; scores of 3.00-3.49 seem to imply teachers are unsure; scores of 3.50 and over seem to imply teachers perceive this type of pedagogic practice as essential.

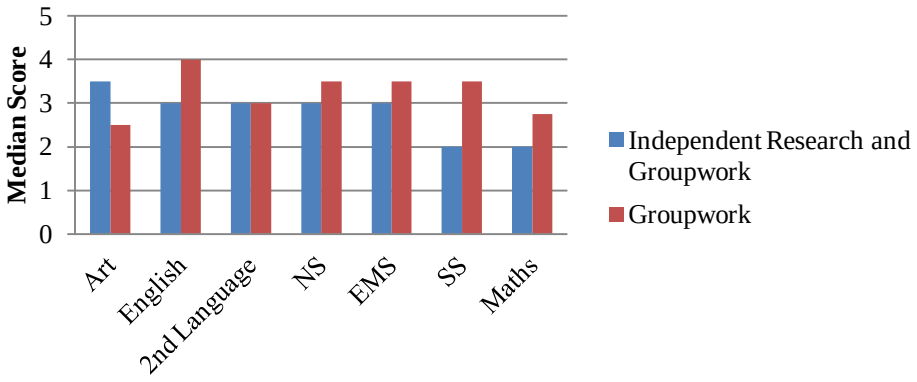


Figure 7: Subject teacher's views on using Group work (q15 & q16) or the combination of group work and Independent research (q7)

4.1.2.2 Facilitation or Instruction

In order to analyse teachers perceptions of teacher instruction or facilitation (Framing), the following statements were posed: (q8) *without explicit instruction from me it is difficult to learn my subject* and (q9) *to teach my subject it is better to facilitate learning rather than use direct instruction.*

Subject	Number in Group (n)	Q8 Median Explicit Instruction	Q8 Mode	Q8 IQR	Q9 Median Facilitation	Q9 Mode	Q9 IQR	Facilitation or Explicit Instruction
Maths	10	**4.00**	4.00	0.75	**3.00**	3.00	0.75	**Instruction**
SS	7	**4.00**	4.00	0.50	**3.00**	3.00	1.00	**Instruction**
EMS	5	**4.00**	4.00	1.00	**3.00**	3.00	**3.00**	**Instruction**
Art	4	3.50	4.00	0.63	3.00	3.00	0.00	**Mixed**
2nd Lang	7	3.00	3.00	0.50	3.00	3.00	0.50	**Mixed**
NS	4	3.50	3.00	**1.25**	3.50	4.00	**1.25**	**Mixed**
English	9	**3.00**	3.00	**2.00**	**5.00**	5.00	1.00	**Facilitation**

Table 7: Subject teachers' preference for Teacher instruction (q8)[20] or Facilitation (q9)[21] – Median, Mode, and IQR Values

[20] For q8 a response of 4 or 5=suggest a performance pedagogic mode; 1 or 2=suggests a competence pedagogic mode.

[21] For q9 a response of a response of 4 or 5= suggests a competence pedagogic mode; 1 or 2 suggests a performance pedagogic mode.

EMS, Maths and SS teachers believe that explicit teacher instruction is necessary within their subject, however they are undecided as to whether facilitation or direct instruction is preferable. The largely varied opinions amongst Maths teachers are due to outlier, but within the EMS subject grouping, diverse opinions are present (note 8).

The majority of English teachers believe facilitation is preferable, however some English teachers are neutral in relation to explicit teacher instruction. Art teachers unanimously believe that some form of explicit instruction is necessary, but they are neutral as to their preference of direct instruction or facilitation (note 9), whereas NS teachers are neutral but hold diverse opinions as to their preference (note 10).

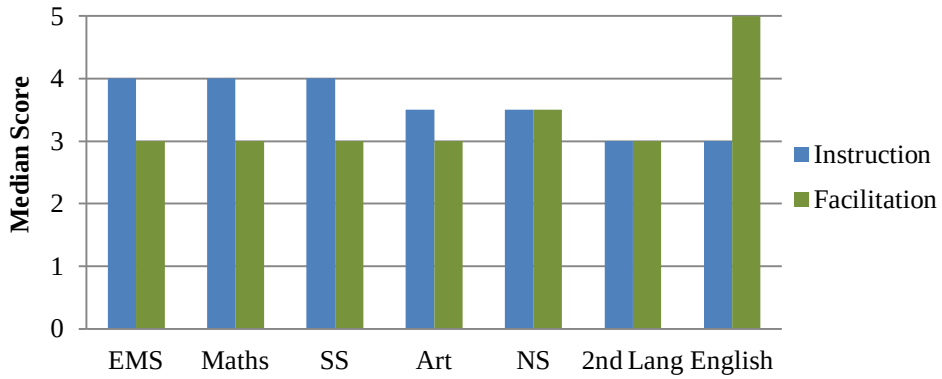


Figure 8: Subject teacher's preferences for Explicit instruction (q8) or Facilitation (q9)

4.1.2.3 Sequencing and Pacing

In order to analyse teachers construal of control in the sequencing and pacing of their lessons (Framing), the following statements were posed: for sequencing (q11) *the sequence in which learners learn concepts or do activities in my subject is very structured* and (q12) *learners should have a lot of leeway in relation to the sequence of what they learn*; for pacing (q13) *tight control of lesson pace is important to me* and (q14) l*earners should have leeway in relation to the pace at which they work*.

4.1.2.3.1 Sequencing

Subject	Number in Group (n)	Q11 Median Structured Sequence	Q11 Mode	Q11 IQR	Q12 Median Learner Sequenced	Q12 Mode	Q12 IQR	Overall Sequencing Preference
EMS	5	5.00	4.00	1.00	2.00	2.00	2.00	**Structured**
Maths	10	4.50	4.00	1.00	1.50	1.00	4.00	**Structured**
NS	4	4.00	4.00	1.00	3.00	3.00	2.00	**Structured**
SS	7	4.00	5.00	2.00	2.00	2.00	2.00	**Structured**
Art	4	3.50	4.00	2.00	3.50	4.00	1.00	**Mixed**
2nd Lang	7	3.00	3.00	1.00	4.00	4.00	2.00	**Relaxed**
English	9	2.00	2.00	3.00	4.00	4.00	2.00	**Relaxed**

Table 8: Subject teachers' preference for Teacher structured sequencing (q11)[22] or Learner controlled sequencing (q12)[23] – Median, Mode and IQR Values

EMS, Maths, NS and SS teachers believe teacher structured sequencing is necessary within their subjects. In addition, EMS, Maths and SS do not believe that learners should be able to sequence what they learn. Large variations within the subject grouping of Maths, in relation to learners being given leeway, indicates the presence of diverse opinions within this subject grouping.

At the other end of the continuum, English teachers do not believe a structured sequence is essential, and consequently think learners should have some leeway in relation to the sequence in which they learn. 2nd Language teachers are unsure as to whether a structured sequence is required, however they believe learners should be given some leeway in relation to the sequence in which they learn.

The majority of Art teachers are more inclined towards structured sequencing of lesson content, but still believe learners should have some leeway in relation to the sequence of what they learn.

4.1.2.3.2 Pacing

Subject	Number in Group (n)	Q13 Median Tight Pacing	Q13 Mode	Q13 IQR	Q14 Median Learner Paced	Q14 Mode	Q14 IQR	Overall Pacing Preference
EMS	5	**5.00**	3.50	**3.00**	**3.00**	3.00	0.00	**Tight**
SS	7	**4.00**	5.00	**3.00**	**3.00**	3.00	1.50	**Tight**
Maths	10	3.50	3.00	**3.00**	3.00	3.00	1.00	**Mixed**
Art	4	3.00	3.00	0.00	3.50	4.00	0.88	**Mixed**
NS	4	3.50	3.00	1.00	**4.00**	4.00	**2.00**	**Relaxed**
English	9	3.00	2.00	**3.00**	**4.00**	4.00	1.00	**Relaxed**
2nd Lang	7	**2.00**	2.00	2.00	3.00	3.00	1.00	**Relaxed**

Table 9: Subject teachers' preference for Tight teacher pacing (q13)[24] or Learner controlled pacing (q14)[25]- Median, Mode and IQR

[22] For q11 and 13 a response of 4 or 5=suggests a performance pedagogic mode; 1 or 2= suggests a competence pedagogic mode.
[23] For q12 and 14 a response of a response of 4 or 5=suggests a competence pedagogic mode; 1 or 2=suggests a performance pedagogic mode.
[24] For q13 a response of 4 or 5=suggests a performance pedagogic mode; 1 or 2= suggests a competence pedagogic mode.
[25] For q14 a response of a response of 4 or 5=suggests a competence pedagogic mode; 1 or 2=suggests a performance pedagogic mode.

EMS and SS teachers prefer tight pacing, however teachers from both subject groups are undecided as to whether learners should have some control over the pacing of lessons. Although Maths and NS teachers are inclined towards tight control of lesson pacing, NS teachers think learners should be given some leeway, whereas Maths teachers are undecided on this issue.

English and 2nd Language teachers do not perceive tight pacing of lessons as important for them, however English teachers think learners should be given some control over lesson pacing, whereas 2nd Language teachers are undecided. Art teachers are unsure as to whether tightly controlled lesson pacing is important, but are inclined towards giving learners some leeway (note 9).

Age and experience

When grouping the data on the age of the teacher and years of teaching experience, irrespective of subject taught, the large Range in the 36-45 (n=19) year old teachers (q11, q12, q13 and q14Range36-45=4.00), and in the 11-20 (n=19) years of teaching experience category (q11 and q12Range11-20=4.00, q13 and q1411-20=3.00), may either be due to the presence of an outlier, or may imply that teachers' age alone is insignificant.

Summary of Pacing and Sequencing

To construct a composite score that may offer a more unified view of the relationship between different subject teachers' view on sequencing and pacing, median scores for the combined sequencing (q11& q12) and pacing (q13 &q14) questions have been calculated. As q12 and q14 were phrased in the negative, the median scores for these questions were reversed. Using these median scores as a guide, the following scoring code has been developed: scores of 1.00 to 1-2.49 seem to suggest unstructured sequencing and weak pacing (-); scores of 2.50-2.99 seem to suggest neutral views; scores of 3.00-3.99 seem to suggest a preference towards strong sequencing and pacing (+); scores of 4.00 and over seem to suggest a preference for teacher structured sequencing and teacher controlled pacing (++). Using this scoring code, the overall preference and relationship between sequencing and pacing, was calculated. Findings of this are displayed in the table 10 below.

Subject	Number in Group (n)	Q11 and 12 Sequence	Q13 and 14 Pace	Sequence/Pace
EMS	5	4.50	3.50	**S++/P+**
Maths	10	4.50	3.25	**S++/P+**
SS	7	4.00	3.50	**S++/P+**
NS	4	3.50	2.50	**S+/P**
Art	4	3.00	2.50	**S+/P**
2nd Lang	7	2.50	2.50	**S/P**
English	9	2.00	2.00	**S-/P-**

Table 10: Summary of teachers' perceptions of Sequencing (q11 & q12) and Pacing (q13 & q14) strength

4.1.2.4 Evaluative Criteria

In order to analyse teachers' beliefs about assessment criteria (Framing), the following statements were posed: (q17) *learners must demonstrate creativity in responding to most of the assessment tasks in my subject* and (q18*) in most of my assessment tasks there are clear cut criteria for the right and wrong answers*.

Subject	Number in Group (n)	Q17 Median Creativity in Evaluation	Q17 Mode	Q17 IQR	Q18 Median Clear Cut Evaluative Criteria	Q18 Mode	Q18 IQR
Maths	10	**2.00**	2.00	1.00	**5.00**	5.00	0.00
EMS	5	3.00	3.00	**2.00**	**5.00**	3.00	1.00
2nd Lang	7	3.00	3.00	**2.00**	**4.00**	4.00	0.50
NS	4	3.50	4.00	**2.00**	3.00	3.00	0.50
SS	7	4.00	4.00	**2.00**	3.00	2.00	**2.00**
English	9	**4.00**	4.00	**3.00**	**2.00**	2.00	1.00
Art	4	**5.00**	5.00	1.00	**2.50**	3.00	1.25

Table 11: Subject teachers' views on Creativity in assessment (q17)[26] and Clear cut evaluative criteria (q18)[27] – Median, Mode and IQR Values

The majority of Maths teachers do not think creativity needs to be expressed in their assessment tasks, whereas Art, English and SS perceive it is essential. In relation to clear cut criteria, EMS, Maths and 2nd Language teachers perceive they are present within their assessments, while English and Art teachers believe clear cut criteria are not present in their types of assessments, all other teachers are undecided. Disparate views are present within all the subject groupings, except for Maths and Art, relative to assessment creativity, whereas teachers are more unified in their views in relation to criteria being clear cut.

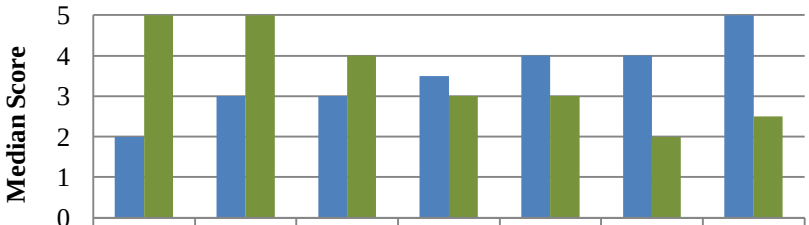
Age and Experience

When grouping the data on the age of the teacher and years of teaching experience, irrespective of subject taught, younger teachers in the 21-25 (n=3) age category, with 1-5 (n=7) years of teaching experience (q18Median21-25=5.00, q18Median1-5=5.00) believe clear cut criteria are present in most of their assessment tasks, whereas older teachers in the 55+ (n=7) age category, with 31+ (n=5) years of teaching experience perceive this is not always the case (q18Median55+=2.00, q18Median31+=2.00). A possible reason for this may be that older teachers have a greater depth of subject knowledge.

[26] For q17 a response of 4 or 5=suggests a performance pedagogic mode; 1 or 2=suggest a competence pedagogic mode.
[27] For q18 a response of 4 or 5=suggests a competence pedagogic mode; 1 or 2=suggests a performance pedagogic mode.

Summary of Evaluative Criteria

For creativity within assessments, median scores of 0-2.50 seem to imply teachers think creativity is not required; scores of 2.51-3.49 seem to imply teachers are neutral; scores of 3.50 and over seem to imply teachers think creativity is present in their evaluations. For clear cut criteria, median scores of 0-2.50 seem to imply clear cut criteria are not present; scores of 2.51-3.49 seem to imply teachers are unsure; scores of 3.50 and over seem to imply that teachers think clear cut criteria are present.



	Maths	EMS	2nd Lang	NS	SS	English	Art
Creativity	2	3	3	3.5	4	4	5
Clear Cut Criteria	5	5	4	3	3	2	2.5

Figure 9: Subject teachers' views of creativity (q17) and clear cut criteria (q18) in evaluation

4.1.2.5 Summary of Regulative Discourse (PD-R) - Framing

I am now in a position to construct a view of different subject teachers' framing strength relative to their regulative discourse (PD-R). Median scores of each of the sub-sections were used a guide to develop the following scoring system seen in table 12. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as mixed or weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as relatively strong (+); scores of 4.00 and above were scored as strong (++). Framing strength was calculated by the adding up all plus and minus signs and calculating the difference between the two[28].

Subject	Number in Group (n)	Group work & Independent Research	Facilitation or Instruction	Pacing & Sequencing	Assessment Criteria	Framing Strength
English	9	Essential (F- -)	Facilitation (F- -)	Weak (F- -)	Weak (F- -)	**Weak**
NS	4	Mixed (F-)	Facilitation (F-)	Mixed (F+)	Mixed (F-)	**Weak**
2nd Lang	7	Mixed (F-)	Mixed (F+)	Weak (F- -)	Mixed (F+)	**Weak**
Art	4	Mixed (F-)	Mixed (F+)	Mixed(F+)	Mixed (F-)	**Mixed**
SS	7	Essential (F- -)	Mixed (F+)	Strong (F++)	Mixed (F-)	**Mixed**
EMS	5	Mixed (F-)	Mixed (F+)	Mixed (F+)	Mixed (F+)	**Strong**
Maths	10	Not Needed (F++)	Mixed (F+)	Strong (F++)	Strong (F++)	**Strong**

Table 12: Teachers' Framing Strength

4.1.3 Summary of Professional Disposition

By combining the PD-I and PD-R of teachers, it is possible to gain a broad sense of different teachers' PD. In general, English teachers construe their subject content as a horizontal discourse and prefer Competence Pedagogic practices in order to instruct their learners, whereas EMS and Maths teachers

[28] Weak framing= more minuses; Mixed Framing= almost the same amount; Strong Framing=more pluses

perceive their subject as a vertical discourse which requires a Competence Pedagogic mode. Art and SS teachers construe their subject as a horizontal discourse requiring a mix of Performance and Competence Pedagogic practices, while 2nd Language and NS teachers perceive their subjects as a mix of vertical and horizontal discourses and prefer a Competence pedagogic mode.

Subject	Classification Strength	Framing Strength	Professional Disposition
English	Weak	Weak	Horizontal/Competence
Art	Weak	Mixed	Horizontal/Performance and Competence
SS	Weak	Mixed	Horizontal/Performance and Competence
2nd Lang	Mixed	Weak	Horizontal and Vertical/Competence
NS	Mixed	Weak	Horizontal and Vertical/ Competence
EMS	Strong	Strong	Vertical and Performance
Maths	Strong	Strong	Vertical and Performance

Table 13: Teachers' Professional Dispositions (PD)

4.2 Orientation towards Tablet Technology (OTT)

To measure Orientation towards Tablet Technology (OTT), the survey asked teachers questions related to the constructs developed in the conceptual framework: Levels of Adoption (LA), Manner of Adoption (MA) and Adoption Activities (AA). Within each of these constructs, the survey asked teachers to report on how they currently use tablet technology, as well as how they envisage in the future they will use tablet technology, respectively referred to hereinafter as *Current* and *Envisaged*[29]. Data analysis related to teachers' accounts of their current use will be reported in detail in each of the following sections, whereas teachers' detailed accounts of envisaged use will only be included where interesting and significant results have been found.

4.2.1 Levels of Adoption (LA)

For data analysis purposes the five Levels of Adoption (LA) have been divided into 3 categories: Familiarization; Utilization and Integration; and Reorientation and Evolution. As some of the survey questions relate to more than one level, they will be reported in each category where they are relevant.

4.2.1.1 Familiarization (LA-F)

In order to assess teacher's accounts of how familiar they are at present ***(Current)*** with tablet technology, the following statement was posed: (q19) *I am comfortable with using tablet technology in my everyday life for my own personal* use. For how familiar teachers envisage in the future (***Envisaged)*** they will be with tablet technology, the following statement was posed: (q40) *I expect I will be comfortable with using tablet technology in my everyday life for my own personal* use.

[29] The words 'envisaged' and 'future' have been used interchangeably in this chapter.

Subject	Number in Group (n)	Q19 Median CURRENT Everyday Life	Q19 Mode	Q19 IQR	Q40 Median FUTURE Everyday Life	Q40 Mode	Q40 IQR	CURRENT/FUTURE Levels of Adoption (LA) Familiarization
English	9	**3.50**	5.00	**2.50**	**5.00**	5.00	**2.00**	**LA-F-C/LA-F-E++**
NS	4	**3.50**	3.00	**1.25**	**4.00**	4.00	0.50	**LA-F-C+/LA-F-E++**
Art	4	4.00	4.00	0.50	4.00	4.00	0.25	**LA-F-C++/LA-F-E++**
2nd Lang	7	4.00	4.00	0.00	4.00	4.00	0.50	**LA-F-C++/LA-F-E++**
SS	7	4.00	4.00	1.00	4.00	4.00	1.00	**LA-F-C++/LA-F-E++**
Maths	10	4.50	5.00	1.00	4.50	5.00	1.00	**LA-F-C++/LA-F-E++**
EMS	5	**5.00**	4.00	0.25	**5.00**	4.00	1.00	**LA-F-C++/LA-F-E++**

Table 14: Subject teachers' accounts of Current (q19)[30] and Envisaged (q40)[31] use of tablets for everyday activities– Median, Mode and IQR Values

At the present time, NS and English teachers report they are undecided as to whether they are comfortable using tablets in their everyday life, however largely varied views are present within the English subject grouping. All other teachers report they are comfortable using tablets in their everyday lives. Large Variations within the groupings of Art and Maths are due to the presence of an outlier.

All teachers report that in the future they will be confident using tablets in their everyday lives, however diverse opinions are evident within the subject grouping of English.

Age and Experience

When grouping the data on the age of the teacher and years of teaching experience, irrespective of subject taught, it appears that teachers' age does not influence how comfortable teachers currently think they are in using tablets in their personal lives, or how confident they expect to be in the future. However, teachers with more teaching experience 31+ years (n=5) report they unsure as to how comfortable they currently are (q19Median31+=3.00). The large range (q19Range31+=4.00) within this group is due to an outlier (q19IQR=1.00).

To construct a view of different subject teachers' accounts of their current and envisaged familiarization with tablet technology (LA-F), the median scores for the LA-F construct were used to develop the scoring system seen in table 14 above. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 were scored as very strong (++).

[30] For q19 a response of 4 or 5=suggests teachers are comfortable with using tablet technology in their everyday lives; 1 or 2= suggests they are not.

[31] For q40 response of 4 or 5=suggests teachers expect that in the future they will be confident using tablet technology in their everyday lives; 1 or 2= suggests they will not.

4.2.1.2 Utilization and Integration (LA-U and LA-I)

Due to the large number of questions related to the teachers' accounts of their ***current*** utilization and integration of tablet technology, and to simplify the survey analysis, similar questions that measure the same aspects of the constructs have been grouped together.

For ***Pedagogic Practice*** (q20) *I am confident in using tablet technology to enable teaching and learning in the classroom*; (q21) *It is easy to use tablet technology to support my own teaching style*; (q28) *It is easy to integrate my existing course material with tablet technology*; (q29) *a major advantage of using tablet technology for teaching is that it enables more relevant teaching.* For ***Increased Content and Pace of Lessons*** (q22) *a major advantage of using tablet technology for teaching is that it enables me to cover more content during my lessons*; (q24) *a major advantage of using tablet technology for teaching is that it enables me to pace lessons more effectively.* For ***Relevance to Learners*** (q23) *a major advantage of using tablet technology for teaching is that it enables me to explain content more effectively to learners*; (q25) *a major advantage of using tablet technology for teaching is that it enables me to motivate learners during my lesson.* For ***Improved Lesson Content*** (q26) *a major advantage of using tablet technology for teaching is that it provides me with new and different course material.*

4.2.1.2.1 Pedagogic Practice

Current[32]

Subject	Number in Group (n)	Q20 Median Confident using tablets in the classroom	Q20 IQR	Q21 Median Easy to use tablets to support teaching style	Q21 IQR	Q28 Median Easy to integrate existing course material	Q28 IQR	Q29 Median Enables more relevant teaching	Q29 IQR
EMS	5	**4.50**	1.00	**4.50**	1.00	3.50	1.00	**4.00**	0.00
Maths	10	**4.00**	0.00	**4.00**	1.00	**4.00**	1.00	3.00	1.00
SS	7	4.00	0.00	**4.00**	1.00	3.00	2.00	**4.00**	1.50
2nd Lang	7	4.00	1.00	3.00	1.00	3.00	1.00	3.00	0.00
English	9	4.00	**2.00**	**4.00**	1.00	**4.00**	**1.50**	3.00	**2.00**
Art	4	**2.50**	0.25	3.50	0.63	3.50	1.25	**4.00**	0.75
NS	4	**2.00**	1.25	**2.00**	1.00	**2.50**	1.50	3.50	**1.50**

Table 15: Subject teachers' accounts of Current Pedagogic Practice (q20, q21, q28, q29)[33] – Median and IQR Values

At the present time, NS teachers do not think that tablets support their teaching; their current pedagogic practices; have found it difficult to integrate tablets into their existing course material; as well as are unsure as to whether tablets enable more relevant teaching. Varied views within this subject grouping are present (note 10).

[32] Due to the large number questions associated with this sub-category, only Median and IQR values will be reported in the summary table.

[33] For all questions related to Pedagogic Practice a response of 4 or 5=suggests teachers are confident using tablets for teaching in the classroom and appreciate the advantages that the technology offers; 1 or 2=suggests they are unsure of using tablets in the classroom and do not see their use in the classroom as advantageous.

Although EMS, English, Maths and SS teachers think tablets support their current teaching style, as well as teaching and learning in general, only English and Maths teachers report they have found this integration relatively easy, whilst EMS (note 8) and SS (note 10) teachers are undecided in this regard. In relation to tablets providing more relevant teaching, EMS and SS teachers agree, whereas English and Maths teachers are undecided. Large variations evident within the Maths subject grouping are due to an outlier.

Art and 2nd Language teachers think they are confident using tablets for teaching and learning, however they are undecided as to whether it is easy to use tablets to support their current teaching style. In relation to integrating existing material with tablet technology, Art and 2nd Language are neutral as to the level of effort required. The majority of Art teachers think that tablets enable more relevant teaching, whereas all 2nd Language teachers are unsure in this regard.

Age and Experience

Years of teaching experience appears to be an influencing factor. Teachers with 1-5 years (n=7) of experience report tablets support their teaching and learning in the classroom (q20Mode1-5=5.00), whereas the majority of the teachers with 31+ years (n=5) teaching experience are unsure (q20Mode31+=3.00, q20IQR31+=0.25).

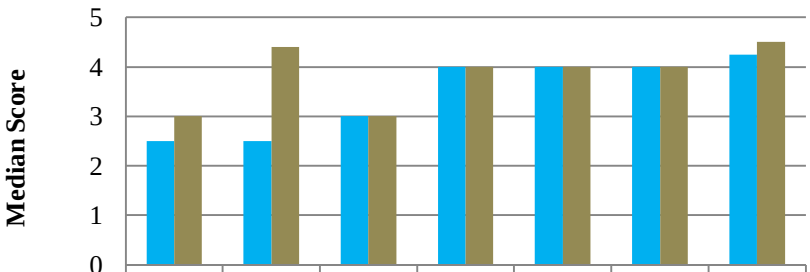
Envisaged[34]

NS, Art and EMS teachers envisage that in the future their pedagogic practice will be enhanced by using tablets, whereas all other teachers report they hold similar views as they currently do. For Art teachers a possible reason for the increase in envisaged use, may be that in the future Art teachers believe tablets will support their current teaching styles, as well as will not require considerable amounts of effort, whereas English teachers expect large amounts of effort will be required to integrate current teaching material with the tablet.

Summary of Pedagogic Practice

To build a comparative view of teachers' accounts of current and envisaged pedagogic practice, a median score was calculated using questions related to this construct. As question 47 was phrased in the negative, it was reversed to enable the median score to be calculated.

[34] Survey questions and detailed findings on teachers' accounts of envisaged use can be found in table AE1.



	NS	Art	2nd Lang	English	SS	Maths	EMS
Current Pedagogic Practice	2.5	2.5	3	4	4	4	4.25
Envisaged Pedagogic Practice	3	4.4	3	4	4	4	4.5

Figure 10: Subject teachers' views of Current and Envisaged Pedagogic Practice (LA-U and LA-I)

4.2.1.2.2 Increased Content and Pace of Lessons

Current

Subject	Number in Group (n)	Q22 Median Covers more content	Q22 IQR	Q24 Median Paces more effectively	Q24 IQR
SS	7	**4.00**	**1.50**	3.00	**2.00**
English	9	3.00	1.00	3.00	1.50
2nd Lang	7	3.00	1.00	2.00	**2.00**
Maths	10	2.50	**1.75**	3.00	**2.50**
EMS	5	2.50	**1.25**	**4.00**	0.25
NS	4	**2.00**	0.75	**2.50**	1.75
Art	4	**1.50**	1.00	**1.50**	1.13

Table 16: Subject teachers' accounts of Current Content (q22) and Pace of Lessons (q24)[35] – Median and IQR Values

Art and NS teachers do not think tablets can assist them in covering more content or controlling the pace of their lessons, whereas the majority of EMS teachers believe tablets assist them in controlling the pace of lessons, however they do not think tablets help them to cover more content. Maths teachers are unsure as to whether tablets can assist them in pacing their lessons, but think tablets do not increase their coverage of content. Variation within the Maths subject grouping indicates diverse views within this grouping.

English, SS and 2nd Language teachers do not think tablets assist them in pacing of lessons, nevertheless English and SS teachers believe tablets facilitate increased content coverage. Variations within the SS subject grouping, indicates diverse views within this subject grouping (note 10).

Age and Experience

When grouping the data on the age of the teacher and years of teaching experience, irrespective of subject taught, teachers in the 21-25 age range (n=3), with 1-5 years teaching experience (n=7) think

[35] For q22 and q24 a response of 4 or 5=suggests teachers believe tablets assist; 1 or 2=suggests they do not.

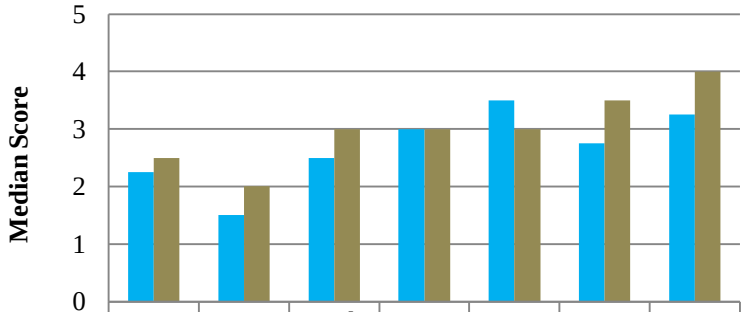
tablets do not currently assist them in controlling the pace of their lessons (q22, q24Mode21-25=2.00, q22,q24Mode1-5=2.00), whereas older teachers in the 55+ age range (n=7) with 31+ years of teaching experience (n=5) think they do (q24Mode=4.00).

Envisaged[36]

In the future, Art and NS teachers envisage that they will hold similar views as they do currently, whereas EMS teachers think that in the future tablets will assist them in covering more content. Maths and SS teachers expect that in the future tablets will assist in controlling the pace of lessons, as well as increasing content coverage. English teachers are undecided as to the ability of tablets to assist in pacing and content coverage, while NS teachers envisage they will hold the same opinions as they currently do in regards to content coverage, but think that in the future tablets will assist them in the pacing of their lessons. Age and years of teaching were found to be insignificant.

Summary of Content and Pace of Lessons

To build a comparative view of teachers' accounts of current and envisaged content improvement and control of lesson pace, a median score was calculated using the questions related to this construct.



	NS	Art	2nd Lang	English	SS	Maths	EMS
Current Content and Pace	2.25	1.5	2.5	3	3.5	2.75	3.25
Envisaged Content and Pace	2.5	2	3	3	3	3.5	4

Figure 11: Subject teachers' views of Current and Envisaged Content and Pace Improvements (LA-U & LA-I)

[36]Survey questions and detailed findings on teachers' accounts of envisaged use can be found in table AE2.

4.2.1.2.3 Relevance to Learners

Current

Subject	Number in Group (n)	Q23 Median Explain content more effectively	Q23 IQR	Q25 Median Motivates learners	Q25 IQR
Maths	10	**4.00**	1.75	4.00	**2.25**
EMS	5	3.00	1.00	4.00	0.00
English	9	3.00	1.00	4.00	**1.50**
2nd Lang	7	3.00	**2.00**	4.00	1.00
SS	7	3.00	**2.50**	4.00	1.00
NS	4	2.50	1.25	**2.00**	0.75
Art	4	**2.00**	0.75	3.00	0.75

Table 17: Subject teachers' accounts of Current Effective Explanation (q23) and Motivation of Learners (q25)[37] – Median and IQR Values

Art and NS teachers do not think tablets assist them in explaining content more effectively, whereas Maths teachers think tablets do assist, all other teachers are undecided. Largely diverse opinions are present within the Maths, 2nd Language and SS subject groupings, while EMS and English teachers hold similar views in this regard.

In relation to motivating learners, NS (note 10) teachers think tablets do not assist in motivating learners, Art teachers are neutral, and all other teachers think they do.

Age and Experience

Teachers' age and years of experience seem influence teachers' current use of tablets. For teaching experience, teachers with little experience in the 1-5 year category (n=7) and teachers with the most experience in the 31+ year category (n=5) think tablets do not assist them in explaining content more effectively to their learners (q23Mode=2.00), however as large variations are present in all age groupings it is unclear whether the similarity between more experienced and less experienced teachers is not simply due to subject being taught. In relation to age of teacher, younger teachers in the 21-25 age category (n=3) do not think tablets can assist their explanations (q23Mode21-25=2.00), whereas older teachers in the 55+ age category (n=7) think they do (q23Mode55+=4.00).

Envisaged[38]

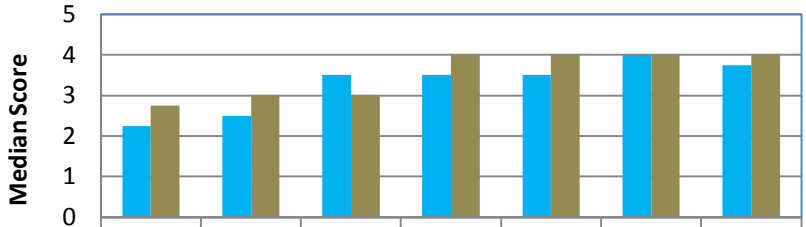
English, Maths and SS teachers think that in the future tablets will enable them to explain more effectively, as well as will assist in motivating their learners, whereas Art and 2nd Language teachers do not concur. Except for Maths teachers, all other teachers hold similar envisaged views in regards to tablets assisting with explanations, while only EMS and SS teachers hold similar views in regards to tablets being able to motivate learners. Teacher's age and experience appear to be significant in

[37] For q23 and q25 a response of 4 or 5=suggests teachers think tablets assist; 1 or 2=suggests they do not.
[38] Survey questions and detailed findings on teachers' accounts of envisaged use can be found in table AE3.

relation to motivating learners, with older and more experienced teachers envisaging that in the future tablets will assist.

Summary of Relevance to Learners

To build a comparative view of teachers' accounts of current and envisaged relevance to learners, a median score was calculated using the questions related to this construct.



	NS	Art	2nd Lang	English	SS	Maths	EMS
Current Relevance to Learners	2.25	2.5	3.5	3.5	3.5	4	3.75
Envisaged Relevance to Learners	2.75	3	3	4	4	4	4

Figure 12: Subject teachers' views of Current and Envisaged Relevance to Learners (LA-U and LA-I)

4.1.2.2.4 Improved Lesson Content

Current and Envisaged

Subject	Number in Group (n)	Q26 Median CURRENT Improve Lesson Content	Q26 IQR	Q47 Median FUTURE Will Improve Lesson Content	Q47 IQR
EMS	5	4.00	0.50	4.00	0.00
SS	7	4.00	0.50	4.00	0.50
English	9	4.00	1.00	4.00	0.00
Maths	10	4.00	1.00	4.00	1.00
Art	4	4.00	1.00	4.00	0.75
2nd Lang	7	4.00	1.00	3.00	2.00
NS	4	2.50	1.50	3.00	0.50

Table 18: Subject teachers' accounts of Current (q26) and Envisaged Improved Lesson Content (q47) [39] - Median and IQR Values

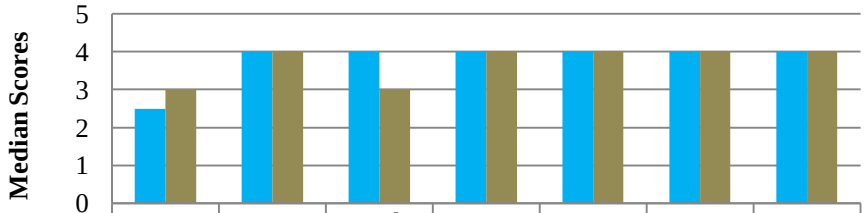
Except for NS teachers ,all teachers think tablets provide them with new and different course material. Similar views are held amongst the majority of teachers within each subject group.

[39]For q26 and q46 a response of 4 or 5=suggests teachers think tablets assist; 1 or 2=suggests they do not.

All teachers, except for NS and 2nd Language teachers believe that in the future tablets will provide them with new and different course material. Large variations within the NS subject grouping imply diverse opinions are present within this subject group (note 10).

Summary of Improved Lesson Content

To build a comparative view of teachers' accounts of current and envisaged relevance to learners, a median score was calculated using the questions related to this construct.



	NS	Art	2nd Lang	English	SS	Maths	EMS
Current Improved Lesson Content	2.5	4	4	4	4	4	4
Envisaged Improved lesson Content	3	4	3	4	4	4	4

Figure 13: Subject teachers' views of Current and Envisaged Improved Lesson Content (LA-U and LA-I)

4.2.1.5 Summary of Utilization and Integration

I am now in a position to construct a view of different subject teachers' accounts of their utilization and integration level of adoption (LA-U and LA-I). Median scores of each of the sub-sections were used to calculate an overall median score for this construct. Using the overall LA-U and LA-I median score as a guide, the following scoring system seen in table 19, was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	CURRENT Pedagogic Practice	FUTURE	CURRENT Increased Content and Lesson Pace	FUTURE	CURRENT Relevance to Learners	FUTURE	CURRENT Improved Lesson Content	FUTURE	Levels of Adoption (LA) Utilization and Integration
NS	4	2.50	3.00	2.25	2.50	2.25	2.75	2.50	3.00	**LA-UI-C-/ LA-UI-E**
2nd Lang	7	3.00	3.00	2.50	3.00	3.50	3.00	4.00	3.00	**LA-UI-C/ LA-UI-E**
Art	4	3.75	3.75	1.50	2.00	2.50	3.00	4.00	4.00	**LA-UI-C+/ LA-UI-E+**
English	9	4.00	4.00	3.00	3.00	3.50	4.00	4.00	4.00	**LA-UI-C++/ LA-UI-E++**
SS	7	4.00	4.00	3.50	3.00	3.50	4.00	4.00	4.00	**LA-UI-C++/ LA-UI-E++**
Maths	10	4.00	4.00	2.75	3.50	4.00	4.00	4.00	4.00	**LA-UI-C++/ LA-UI-E++**
EMS	5	4.25	4.50	3.25	4.00	3.75	4.00	4.00	4.00	**LA-UI-C++/ LA-UI-E++**

Table 19: Subject teachers' accounts of Current and Envisaged (Future) Utilization and Integration of Tablet Technology – Median Values

Overall English, SS, Maths and EMS teachers think their current utilization and integration of tablet technology is quite extensive, and they do not envisage that in the future this will change in any significant way. NS, Art and 2nd Language teachers report they currently use tablets in a limited way and envisage that in the future they will shift slightly towards greater tablet use.

4.2.1.3 Reorientation and Evolution (LA-R and LA-E)

Current Reorientation and Evolution

With a view of simplifying the survey analysis, similar questions that measure the same aspects of the construct have been grouped together. In order to assess if teachers currently see the tablet as a resource that enables them to reconceptualise or re-evaluate their pedagogic , the following statements were posed for ***Personal Pedagogic Practice*** (q30) *tablet technology has enabled me to reorient my current teaching style*; (q31) *tablet technology has enabled me to innovate and change my current teaching style. For* ***General View of Pedagogic Practice*** (q32) *tablet technology enables the reorientation and evolution of current teaching practices* and (q33) *a major advantage of using tablet technology for teaching is that it reshapes formal education.*

Envisaged Reorientation and Evolution

As with teachers' accounts of their current tablet use, similar questions that measure the same aspects of the construct have been grouped together. In order to assess if teachers envisage the tablet being used in the future to support their current pedagogic practice, the following statements were posed: ***Personal Pedagogic Practice*** (q51) *I expect that tablet technology will enable me to innovate and change my current teaching style;* (q52) *I expect that tablet technology will enable me to reorient my current teaching style. For* ***General View of Pedagogic Practice*** (q53) *I expect that tablet technology will enable the reorientation and evolution of current teaching practices and (q55) I expect that a major advantage of tablet technology is that it will reshape formal education.*

4.2.1.3.1 Personal Pedagogic Practice

Current and Envisaged

Subject	Number in Group (n)	Q30 Median CURRENT Reorient my teaching style	Q30 IQR	Q31 Median CURRENT Innovate my teaching style	Q31 IQR	Q52 Median FUTURE Will reorient my teaching style	Q52 IQR	Q51 Median FUTURE Will innovate my teaching style	Q51 IQR
English	9	4.00	0.50	4.00	1.00	4.00	1.00	4.00	0.00
SS	7	4.00	**2.00**	4.00	0.00	4.00	1.00	4.00	0.50
Maths	10	4.00	**2.75**	4.00	**1.50**	4.00	1.00	4.00	0.75
Art	4	3.50	1.13	**2.50**	0.88	3.00	0.50	**3.00**	0.25
EMS	5	3.00	0.25	**3.00**	0.25	4.00	**2.00**	**5.00**	**2.00**
2nd Lang	7	3.00	**2.00**	**3.00**	1.00	3.00	0.00	**4.00**	**1.50**
NS	4	3.00	**2.25**	3.00	2.25	3.50	1.75	3.50	1.50

Table 20: Subject teachers' accounts of Current (q30, q31) and Envisaged (q51, 52) Personal Pedagogic Practice[40] - Median and IQR Values

English, Maths and SS teachers think tablet technology enables them to change and reorientate their teaching style, whereas all other teachers are unsure or disagree. Large variations within the subject groupings of Maths and NS indicate diverse opinions are present with these subject groups.

Art teachers envisage that in the future they will be unsure as to whether tablets will enable the reorientation and change of their current teaching style, while EMS, English, Maths and SS teachers envisage that in the future tablets will assist with reorientation. Diverse opinions are evident within the subject groupings of EMS (note 8) and NS (note 10).

Age and Experience

When grouping data on years of teaching experience and teacher's age, irrespective of subject taught, younger teachers in the 21-25 age category (n=3) think tablets cannot assist in the reorientation of their current teaching style (q30Median21-25=2.00), whereas teachers in other age categories (n=43) believe they do (q30Median=4.00). In the future, years of teaching appears to be an influencing factor, with less experienced teachers in the 1-5 year category (n=7) envisaging that in the future tablets will not reorientate or change their current teaching style (q51, q52Mode1-5=2.00), whereas more experienced teachers in the 31+ year range (n=5) believe they will (q51, q52Mode31+=4.00).

[40] For all the questions related to Personal Pedagogic Practice a response of 4 or 5=suggests teachers view the tablet as a means by which pedagogic practices, is being or will be, re-orientated and changed; 1 or 2=suggests they do not view the tablet as a means by which pedagogic practices is being or will be re-orientated or changed.

4.2.3.1.2 General View of Pedagogic Practice

Current and Envisaged

Subject	Number in Group (n)	Q32 Median CURRENT Reorient teaching styles	Q32 IQR	Q33 Median CURRENT Innovate teaching style	Q33 IQR	Q53 Median FUTURE Will reorient teaching style	Q53 IQR	Q55 Median FUTURE Will reshape formal education	Q55 IQR
EMS	5	4.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00
Maths	10	**4.00**	0.75	**3.00**	**1.75**	**3.50**	1.00	**3.50**	**1.75**
SS	7	4.00	1.00	4.00	**1.50**	4.00	**1.50**	4.00	**1.50**
English	9	3.50	**1.75**	**4.00**	**2.00**	4.00	0.00	**3.00**	**3.00**
Art	4	**3.00**	0.25	**3.00**	0.00	3.50	1.00	**2.50**	1.00
2nd Lang	7	**3.00**	1.00	**3.00**	1.00	4.00	**1.50**	3.00	1.0
NS	4	**3.00**	**1.50**	**3.00**	0.50	3.00	**2.00**	3.00	0.75

Table 21: Subject teachers' accounts of Current (q32, q33) and Envisaged (Future) (q52, 54) General Pedagogic Practice[41] - Median and IQR Values

EMS, Maths and SS teachers believe tablets are reorienting current teaching practices, as well as reshaping formal education, whereas Art, English, NS and 2nd Language teachers are undecided. Art and EMS teachers are unanimous in their opinions of tablets' abilities to change and reorientate their current pedagogic practices and reshape formal education, however diverse opinions are evident within the subject groupings of English, SS, Maths and NS in relation to the reshaping of formal education.

In the future, Art and NS teachers are undecided as to whether tablets will reorientate current teaching practices, while all other teachers envisage that in the future they will. EMS, Maths and SS teachers believe that in the future tablets will reshape formal education, Art teachers disagree, and all other teachers are neutral. Large variations within the subject groupings of English, SS, Maths and NS, suggest that diverse views are present within each subject grouping.

Age and Experience

Younger teachers in the 21-25 age category (n=3) think tablets do not assist in the reorientation of general teaching styles (q30Median21-25=2.00), whereas all other teachers (n=43) think tablets do (q30Median=4.00).

In regards to future expectations, years of teaching appears to be an influencing factor, with less experienced teachers in the 1-5 year category (n=7) believing that in the future tablets will not assist them in the reorientation or change of their current teaching styles (q51, q52Mode1-5=2.00), and more experienced teachers in the 31+ year category (n=5) believe they will (q51, q52Mode31+=4.00). In

[41] For all the questions related to General Pedagogic Practice a response of 4 or 5=suggests teachers envisage that in the future tablet will re-orientate and change general pedagogic practices; 1 or 2=suggests they envisage they will not.

relation to reshaping formal education and current pedagogic practices in general, teacher's age appears to be important. Younger teachers in the 21-25 age category (n=3) believe that in the future tablets will not enable the reorientation of current pedagogic practice (q53Mode21-25=2.00), nor will they reshape formal education (q55Mode21-25=2.00), whereas older teachers in the 55+ age category believe that in the future tablets will reorientate teaching practices (q53Mode55+=4.00) and reshape formal education (q55Mode55+=4.00).

4.2.1.3.3 Summary of Reorientation and Evolution

I am now in a position to construct a view of different subject teachers' accounts of their Reorientation and Evolution Levels of Adoption (LA-R and LA-E). Median scores of each of the sub-sections were used to calculate an overall median score for this construct. Using the overall LA-R and LA-U median score as a guide, the following scoring system seen in table 22 was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	CURRENT Personal Pedagogic Practice	FUTURE	CURRENT General Pedagogic Practice	FUTURE	Levels of Adoption (LA) Reorientation and Evolution
NS	4	3.00	3.50	3.25	3.25	**LA-RE-C/LA-RE-E**
Art	4	3.00	3.00	3.00	3.50	**LA-RE-C/LA-RE-E**
2nd Lang	7	3.00	3.50	3.00	3.50	**LA-RE-C/LA-RE-E**
EMS	5	**3.00**	**4.50**	4.00	4.00	**LA-RE-C+/LA-RE-E++**
Maths	10	4.00	4.00	3.50	3.75	**LA-RE-C++/LA-RE-E+**
English	9	4.00	4.00	3.75	4.00	**LA-RE-C++/LA-RE-E++**
SS	7	4.00	4.00	4.00	4.00	**LA-RE-C++/LA-RE-E++**

Table 22: Subject teachers' accounts of Current and Envisaged (Future) use of tablets in relation to Reorientation and Evolution – Median Values

4.2.1.4 Summary of Levels of Adoption

Using the summary scores of Familiarization, Utilization-Integration, Reorientation-Evolution, I am now in a position to construct a view of different subject teachers' overall Levels of tablet Adoption (LA). Median scores of each of the levels were used to calculate an overall median score for this construct. Using the overall LA-F, LA-UI and LA-RE median score as a guide, the following scoring system seen in table 24 was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	CURRENT Familiarization LA-F	FUTURE	CURRENT Utilization and Integration LA-U/LA-I	FUTURE	CURRENT Reorientation and Evolution LA-R/LA-E	FUTURE	Levels of Adoption (LA) CURRENT/ ENVISAGED
NS	4	3.50	4.00	2.50	3.00	3.00	3.25	**LA-A/LA-E**
Art	4	4.00	4.00	3.50	3.25	3.00	3.25	**LA-A/LA-E**
2nd Lang	7	4.00	4.00	3.00	3.00	3.00	4.00	**LA-A/LA-E+**
English	9	3.00	5.00	4.00	4.00	4.00	4.00	**LA-A+/LA-E++**
SS	7	4.00	4.00	4.00	4.00	4.00	4.00	**LA-A++/LA-E++**
Maths	10	4.50	4.50	4.00	4.00	4.00	3.75	**LA-A++/LA-E++**
EMS	5	5.00	5.00	4.00	4.00	3.50	4.00	**LA-A++/LA-E++**

Table 23: Teachers Current and Envisaged (Future) Levels of Adoption of Tablet Technology – Median Values

From table 23 it seems that NS, Art and 2nd Language teachers' current adoption of tablet technology in the classroom is limited, as well their views in relation to tablets reorientating and evolving formal education are mainly neutral or undecided, while their personal use of tablets is relatively extensive. English teachers at the present time, are limited in their personal use of tablets, however they report they have adopted tablet technology extensively in the classroom, as well as think tablets are enabling the reorientation and evolution of formal education. Maths, SS and EMS teachers' current level of tablet adoption appears to be extensive, both in their personal lives, as well as in the classroom, and they believe tablets are reshaping and reorientating formal education. In the future, English teachers think they will be more confident using tablets in their personal lives. Most teachers expect that in the future their level of tablet adoption in the classroom will increase. In addition, they think that in the future, tablets will play a role in the reorientation and reshaping of formal education.

4.2.2 Manner of Adoption (MA)

For purpose of data analysis, teachers' accounts of their current tablet use and their envisaged future tablet use, will be reported by categorising teachers' Manner of Adoption as either a product technology (MA-P), supporting current teaching practice, or as an idea technology (MA-I)[42]. Each manner will be reported separately, following which similarities and comparisons will be drawn.

4.2.2.1 Manner of Product (MA-P)

4.2.2.1.1. Current Manner of Product (MA-PC)[43]

To investigate if teachers view tablets as a support to their current teaching practices, the following statements were posed: (q22) *a major advantage of using tablet technology for teaching is that it enables me to cover more content during my lessons*; (q23) *a major advantage of using tablet technology for teaching is that it enables me to explain content more effectively to learners*; (q24) *a*

[42] Within this study, it is assumed that teachers who view tablet technology as an idea technology, consequently see the tablet as a means to reorientate their pedagogic practices.

[43] Due to the large number of questions associated with this construct, and because all of these questions have been reported on before, only median values have been reported in the summary table. Mode and IQR values will be reported in the text, where appropriate.

major advantage of using tablet technology for teaching is that it enables me to pace lessons more effectively; (q25) *a major advantage of using tablet technology for teaching is that it enables me to motivate learners during my lessons* and (q26) *a major advantage of using tablet technology for teaching is that it provides me with new and different course material;* (q29) *a major advantage of using tablet technology for teaching is that it enables more relevant teaching*; (q34) *using tablet technology enables me to better educate learners* and (q35) *a major advantage of tablet technology is that it support my current teaching style.*

Subject	Number in Group (n)	Q22 Cover more content	Q23 Explain more effectively	Q24 Pace lessons	Q25 Motivate learners	Q26 New and different course material	Q29 More relevant teaching	Q34 Better educate learners	Q35 Supports current teaching style
SS	7	4.00	3.00	3.00	4.00	4.00	4.00	3.00	4.00
English	9	3.00	3.00	3.00	4.00	4.00	3.00	4.00	4.00
2nd Lang	7	3.00	3.00	**2.00**	4.00	4.00	3.00	**2.00**	3.00
EMS	5	**2.50**	3.50	4.00	4.00	4.00	4.00	4.00	4.00
Maths	10	**2.50**	4.00	3.00	4.00	4.00	3.00	3.50	4.00
NS	4	**2.00**	**2.50**	**2.50**	**2.00**	4.00	3.50	**2.50**	**2.50**
Art	4	**1.50**	**2.00**	**1.50**	3.00	4.00	4.00	**2.00**	**3.00**

Table 24: Subject teachers' Current views of tablets as a Product (q22, q23, q24, q25, q26, q29, q34, q35)[44] – Median Values

Some English teachers believe that tablets motivate their learners, however disparate views are evident within this subject grouping (q25IQREng=1.50). Furthermore, English teachers are unsure as to whether tablets assist them in increasing content coverage and facilitating more effective explanations. In relation to explaining content more effectively, or assisting them in pacing their lessons, English teachers think tablets are not beneficial. The tablet's ability to provide new and different course material is viewed by the majority of English teachers, as advantageous.

2nd Language teachers believe that tablets provide them with new and different course material, as well as motivate their learners. When asked about the tablet's ability to assist in pacing of lessons, increasing content coverage and enabling more effective explanations, the majority of 2nd Language teachers think tablets cannot assist, with disparate views evident within this subject grouping in relation to lesson pacing (q22IQR2ndLang=2.00), and effective explanations (q23IQR2ndLang=2.00).

EMS and SS teachers report tablets assist them in motivating learners and providing new and different course material. EMS teachers are unsure as to whether tablets assist them covering more content, whereas SS teachers believe they do, diverse opinions are evident in both groupings (q22IQREMS=1.25, q22IQRSS=1.50). In relation to tablets facilitating more effective explanations, EMS and SS teachers are unsure that tablets are beneficial. Diverse opinions are present within the SS

[44] For all the questions related to Current MA-P a response of 4 or 5=suggests teachers view the tablet as a means to support their current teaching practice; 1 or 2=suggests they do not.

subject grouping (q23IQRSS=2.50), whereas EMS teachers are more united (q23IQREMS=0.75). The tablet's ability to assist with lesson pacing is viewed by EMS teachers as beneficial. In addition, new and different course material is viewed by the majority of EMS and SS teachers as advantageous.

Maths teachers think tablets assist them in explaining more effectively and motivating learners, however large variations amongst this subject grouping are evident (q23IQRMaths=1.75, q25IQRMaths=2.25). In regards to increasing coverage content, the majority of Maths teachers think tablets do not help, however again this is not an opinion unanimously held (q22IQRMaths=1.75). Similarly, in relation to tablets assisting in lesson pacing, the majority of Maths teachers do not think tablets are beneficial, however disparate views (q24IQRMaths=2.50) are once again evident within this subject grouping. The tablet's ability to provide new and different course material is viewed by the majority of Maths teachers as advantageous.

Age and Experience

Teachers' age appears to be an influencing factor in relation to explaining content more effectively and lesson pacing. The majority of teachers in the 21-25 age category (n=3) believe tablets do not assist in affecting better explanations (q23Mode21-25=2.00), or pacing of lessons (q24Mode21-25=2.00), whereas teachers in the 55+ age range think they do (q23Mode55+=4.00, q24Mode55+=4.00). Diverse opinions are evident (q23IQR55+=1.75, q24IQR55+=1.75).

4.2.2.1.2 Summary of Current MA-P

I am now in a position to construct a view of different subject teachers' accounts of their current use of tablets as a support (MA-P). All questions related to this construct were combined to calculate an overall median. Using the overall MA-P (current) median score as a guide, the following scoring system, seen in table 24, was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	CURRENT USE	Content Coverage	Effective explanations	Lesson Pacing	Motivation of Learners	New and Different Course Material	Manner of Adoption (MA) Tablet as a Support (MA-P)
NS	2	**2.50**	No	No	No	No	No	Tablets Not a Support (MA-PC-)
Art	4	**2.50**	No	No	No	Neutral	Yes	Tablets Not a Support (MA-PC-)
2nd Language	7	3.00	Neutral	Neutral	No	Yes	Yes	Mixed Views on tablets as a Support (MA-PC)
English	9	3.50	No	Neutral	Yes	Yes	Yes	Mixed Views on tablets as a Support (MA-PC+)
Maths	10	3.75	No	Yes	Neutral	Yes	Yes	Mixed Views on tablets as a Support (MA-PC+)
EMS	5	**4.00**	No	Neutral	Yes	Yes	Yes	Tablets as a Support (MA-PA++)
SS	7	**4.00**	Yes	Neutral	Neutral	Yes	Yes	Tablets as a Support (MA-PA++)

Table 25: Summary of subject teachers' Current views of tablets as a Support technology– Median Values

4.2.2.1.3 Envisaged Manner of Product (MA-PE)

To investigate teachers' envisaged accounts of tablets as a support to their teaching practices, the following statements were posed: (q42) *I expect that it will be easy to use tablet technology to support my own teaching style*; (q43) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to cover more content during my lessons*; (q44) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to explain content more effectively to learners*; (q45) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to pace lessons more effectively*; (q46) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to motivate learners during my lessons;* (q47) *I expect that a major advantage of using tablet technology for teaching is that it will provide me with new and different course material;* (q49) *I expect* that *a major advantage of using tablet technology for teaching is that it will enable more relevant teaching* and (q54) *I expect that using tablet technology will enable me to better educate learners*.

Subject	Number in Group (n)	Q42 Will be easy to support teaching style	Q43 Will cover more content	Q44 Will explain more effectively	Q45 Will pace lessons	Q46 Will motivate learners	Q47 Will provide new and different course material	Q49 Will enable more relevant teaching	Q54 Will better educate learners
EMS	5	4.00	4.00	3.50	4.00	4.00	4.00	4.00	4.00
Maths	10	4.00	3.50	4.00	3.00	4.00	4.00	3.00	3.50
SS	7	4.00	3.00	3.00	3.00	4.00	4.00	4.00	3.00
English	9	4.00	3.00	3.00	3.00	4.00	4.00	3.00	4.00
2nd Lang	7	3.00	3.00	3.00	2.00	4.00	4.00	3.00	2.00
NS	4	**2.50**	**2.00**	**2.50**	**2.50**	**2.00**	4.00	3.50	**2.50**
Art	4	**3.00**	**2.00**	**2.00**	**1.50**	**3.00**	4.00	4.00	**2.00**

Table 26: Subject teachers' Envisaged views of tablets as a Product (q42, q43, q44, q45, q46, q47, q49, q54)[45] – Median Values

Art, NS and 2nd Language teachers are unsure whether tablet technology in the future will be a supportive tool in relation their subject or pedagogic practice, all other teachers envisage that in the future they will be. Art and NS teachers are more neutral in relation to tablet technology being a support in the classroom in the future, while 2nd Language, English and Maths teachers envisage that in the future, tablets will be used to support their respective subjects and personal teaching styles. However large variations in the Maths subject grouping (q42IQRMaths=1.75, q43IQRMaths=1.50, q44IQRMaths=1.75, q45IQRMaths=2.00), imply diverse opinions are evident within this group. Overall, EMS and SS teachers' current and envisaged views are the same.

English and SS teacher think that in the future, tablets will assist with the explanation of content. Currently EMS and Maths teachers think tablets cannot assist them in covering more content, however the majority of EMS teachers and some of the Maths teachers (q42IQRMaths=1.75), envisage that in the future, tablets will increase content coverage. 2nd Language teachers also envisage that in the future, tablets will assist them more with pacing of lessons.

All teachers, with the exception of NS and 2nd Language, think that in the future tablets will still provide new and different course material.

Age and Experience

When grouping data on teacher's age and years of experience, irrespective of subject, it appears that teaching experience does not influence teachers' opinions of tablets being a support in the classroom, however it appears to be an influencing factor in relation to increasing content coverage. Some of the teachers (q43IQR1-5=1.50) in the 1-5 year category (n=7), think that in the future tablets will not be able to assist in content coverage (q43Mode1-5=2.00), while the majority of teachers in the 31+ (n=5)

[45] For all questions in relation to Envisaged MA-P a response of 4 or 5=suggests teachers envisage that in the future tablets will be a means to support their current teaching practice; 1 or 2=suggests they will not.

year category (q43IQR55+=1.00) think that in the future, tablets will be able to assist (q43Mode31+=4.00).

4.2.2.1.4 Summary of Envisaged MA-P

I am now in a position to construct a view of different subject teachers' views as to their envisaged use of tablets as a support (MA-P). All questions related to this construct were combined to calculate an overall median for this construct. Using the overall MA-P (current) median score as a guide, the following scoring system, seen in table 27, was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	Median ENVISAGED Use	Content Coverage	Effective explanations	Lesson Pacing	Motivation of Learners	New and Different Course Material	Manner of Adoption (MA) Tablet as a Support in the Future (MA-PE)
NS	2	3.00	No	No	No	No	No	Mixed Views on tablets as a Support in the Future (MA-PE)
Art	4	3.00	No	No	No	Neutral	Yes	Mixed Views on tablets as a Support in the Future (MA-PE)
2nd Language	7	3.00	Neutral	Neutral	No	Yes	Yes	Mixed Views on tablets as a Support in the Future (MA-PE)
English	9	4.00	No	Neutral	Yes	Yes	Yes	Tablets as a Support in the Future (MA-PE++)
Maths	10	4.00	No	Yes	Neutral	Yes	Yes	Tablets as a Support in the Future (MA-PE++)
EMS	5	4.00	No	Neutral	Yes	Yes	Yes	Tablets as a Support in the Future (MA-PE++)
SS	7	4.00	Yes	Neutral	Neutral	Yes	Yes	Tablets as a Support in the Future (MA-PE++)

Table 27: Summary of Subject teachers' Envisaged views of tablets as a Support technology

4.2.2.2 Manner of Idea (MA-I)[46]

4.2.2.2.1 Current Manner of Idea (MA-IC)

In order to investigate if teachers view tablet technology as a support to their current teaching practices, the following statements were posed: (q30) *tablet technology has enabled me to reorient my current teaching style*; (q31) *tablet technology has enabled me to innovate and change my current teaching style;* (q32) *a major advantage of using tablet technology for teaching is that it reshapes formal education;* (q33) *tablet technology enables the reorientation and evolution of current teaching practices and* (q34) *using tablet technology enables me to better educate learners.*

[46] Due to the large number of questions associated with this construct, and because all of these questions have been reported on before, only the median score has been reported in the summary table. Mode and IQR values will be reported in the text, where appropriate.

Subject	Number in Group (n)	Q30 Reorient teaching style	Q31 Innovate and change teaching style	Q32 Reshapes formal education	Q33 Reorient and evolve current teaching	Q34 Better educate learners
SS	7	**4.00**	**4.00**	**4.00**	**4.00**	3.00
English	9	**4.00**	**4.00**	**4.00**	3.50	**4.00**
Maths	10	**4.00**	**4.00**	3.00	**4.00**	3.50
EMS	5	3.00	3.00	**4.00**	**4.00**	**4.00**
2nd Lang	7	3.00	3.00	3.00	3.00	**2.00**
NS	4	3.00	3.00	3.00	3.50	**2.50**
Art	4	**3.50**	**2.50**	**3.00**	**3.00**	**2.00**

Table 28: Subject teachers' Current views of tablets as an Idea (q30, q31, q32, q33, q34)[47] – Median Values

At the present time, NS, Art and 2nd Language teachers are undecided as to whether tablet technology enables change and reorientation of their pedagogic practice and reshapes formal education. Similar views are present within the subject grouping of Art, however 2nd Language (note 11) and NS (note 10) teachers are divided.

Art teachers do not think tablets enable them to better educate learners, or assist them in changing their current teaching styles. In relation to the reorientation of current teaching style; the reshaping of formal education; and the ability of tablets to evolve current teaching practices in general, Art teachers are undecided.

The majority of 2nd Language and NS teachers do not believe tablet technology enables them to better educate learners, however diverse views are evident in within both subject groupings (q34IQR2ndLang=2.00, q34IQRNS=1.50). In relation the reorientation of their current teaching style and reshaping formal education, 2nd Language and NS teachers are undecided, however largely varied opinions are evident within these subject groupings (q30IQR2ndLang=2.00, q30IQRNS=2.25).

English teachers are almost unanimous (q30IQREng=0.50, q31IQREng=1.00) relative to tablets assisting with the reorientation and innovation of their current teaching styles. English teachers think tablets assist in better educating learners and reshaping formal education, however disparate views are evident (q34IQREng=1.50, q32IQREng=2.00). Maths teachers are unsure whether tablets are reshaping formal education and enabling learners to be educated better. However, they do think tablets enable them to reorientate and innovate their current teaching styles, as well as current teaching practices in general. Diverse views are evident within the subject grouping, except in relation to general teaching practices (q33IQRMaths=0.75).

[47] For all questions in relation to Current MA-I a response of 4 or 5=suggests teachers view the tablet as a means to change and shift their current teaching practice; 1 or 2=suggests the tablet is not viewed as a means to re-orientate or shift pedagogic practice in the classroom.

As with NS and 2nd Language teachers, EMS teachers are undecided as to whether tablets assist them in the reorientation and innovation of their current teaching styles, but believe that tablets enable them in better educating learners; reshaping formal education; and changing and innovating general teaching practices. Views within the EMS subject grouping appear to be unanimous (q30 to q34IQREMS=0.25).

SS teachers believe tablets enable them to reorientate their current teaching styles, in addition to, reshaping formal education and current teaching practices. However, diverse opinions are evident in relation to the reorientation of their current teaching style (q30IQRSS=2.00), and the reshaping of formal education (q32IQRSS=1.50). Similar views are apparent in relation to the general reorientation and evolution of current teaching practices (q33IQRSS=1.00).

Age and Experience

Younger teachers in the 21-25 (n=3) age category think tablets do not assist them in the reorientation of their teaching style (q30Median21-25=2.00), enabling better educating of learners (q34Median21-25=2.00), the reshaping of formal education (q32Median21-25=2.00) or the reorientation and evolution of general teaching practice (q33Median21-25=2.00), whereas older teachers in the 55+ (n=7) age category believe that tablets are able to assist them (q30, q32, q33, q34Median55+=4.00).

4.2.2.2.2 Summary of Current MA-I

I am now in a position to construct a view of different subject teachers' views as to their current use of tablets as an innovative technology (MA-I). All questions related to this construct were combined to calculate an overall median for this construct. Using the overall MA-I (current) median score as a guide the following scoring system seen in table 29 below was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	Median CURRENT	Reorientate Own Current Teaching	Innovate and Change Own Current Teaching	Better educate learners	Reshape Formal Education	Reorientate and Evolve General Teaching	Manner of Adoption (MA) Tablet as a Support (MA-P)
Art	4	3.00	Neutral	No	No	Neutral	Neutral	Mixed views of tablets as Innovative (MA-IA)
NS	2	3.00	Neutral	Neutral	No	Neutral	Neutral	Mixed views of tablets as Innovative (MA-IA)
2nd Language	7	3.00	Neutral	Neutral	No	Neutral	Neutral	Mixed views of tablets as Innovative (MA-IA)
Maths	10	4.00	Yes	Yes	Neutral	Neutral	Yes	Tablet as Innovative (MA-IA++)
EMS	5	4.00	Neutral	Neutral	Yes	Yes	Yes	Tablets as Innovative(MA-IA++)
SS	7	4.00	Yes	Yes	Neutral	Yes	Yes	Tablets as Innovative (MA-IA++)
English	9	4.00	Yes	Yes	Yes	Yes	Neutral	Tablets as Innovative (MA-IA++)

Table 29: Summary of subject teachers' Current views on tablets as an Innovative technology – Median Values

4.2.2.2.3 Envisaged Manner of Idea (MA-IE)

In order to investigate if teachers envisage that in the future tablet technology will be used to re-orientate and change their current teaching practices, the following statements were posed: (q52) *I expect that tablet technology will enable me to innovate and change my current teaching style;* (q51) *I expect that tablet technology will enable me to reorient my current teaching style*; (q53) *I expect that tablet technology will enable the reorientation and evolution of current teaching practices;* (q54) *I expect that using tablet technology will enable me to better educate learners* and (q55) *I expect that a major advantage of tablet technology is that it will reshape formal education.*

Subject	Number in Group (n)	Q51 Will reorient teaching style	Q52 Will innovate and change teaching style	Q53 Will Reshape formal education	Q54 Will reorient and evolve current teaching	Q55 Will better educate learners
SS	7	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**
English	9	4.00	4.00	4.00	3.00	3.00
EMS	5	**4.00**	**5.00**	**4.00**	**4.00**	**4.00**
Maths	10	4.00	4.00	3.50	4.00	3.50
NS	4	3.50	3.50	3.00	2.50	3.00
Art	4	**3.50**	**3.00**	**3.50**	**2.50**	**2.50**
2nd Lang	7	3.00	4.00	4.00	3.00	3.00

Table 30: Subject teachers' Envisaged views of tablets as an Idea (q51, q5, q53, q54, q55)[48] – Median

Art and NS teachers believe that in the future, tablets will not be used as an innovative technology, whereas SS, English, EMS and Maths teachers in general, believe they will. 2nd Language teachers do

[48] For all questions in relation to Envisaged MA-I a response of 4 or 5=suggests teachers envisage that in the future tablets will change and shift their current teaching practice; 1 or 2=suggests they do not envisage that in the future they will.

not envisage that in the future, tablets will enable them to reorientate their own teaching style, or teaching in general.

Age and Experience

In relation to tablets being able to reorientate and innovate general teaching practices, younger teachers in the 21-25 (n=3) age category (q33Median21-25=2.00, q52Median21-25=2.00) hold similar current and envisaged views, whereas older teachers in the 55+ age category (n=7) envisage that in the future, they will shift to slightly more positive views (q33Median55+=3.50, q52Median55+=4.00

4.2.2.2.4 Summary of Envisaged MA-I

I am now in a position to construct a view of different subject teachers' views as to their future use of tablets as an innovative technology (MA-I). All questions related to this construct were combined to calculate an overall median for this construct. Using the overall MA-I (envisaged) median score as a guide, the following scoring system seen in table 31 was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	ENVISAGED Use	Reorientate Own Current Teaching	Innovate and Change Own Current Teaching	Reshape Formal Education	Reorient and Evolve General Teaching	Better educate learners	Manner of Adoption (MA) Tablet as a Support (MA-I)
Art	4	3.00	Neutral	Neutral	Neutral	No	No	Mixed views of tablets as Innovative (MA-IA)
NS	2	3.00	Neutral	Neutral	No	Neutral	Neutral	Mixed views of tablets as Innovative (MA-IA)
2nd Language	7	3.00	Neutral	Yes	Yes	Neutral	No	Mixed views of tablets as Innovative (MA-IA)
Maths	10	4.00	Yes	Yes	Neutral	Yes	Neutral	Tablet as Innovative (MA-IA++)
EMS	5	4.00	Yes	Yes	Yes	Yes	Yes	Tablets as Innovative (MA-IA++)
SS	7	4.00	Yes	Yes	Yes	Yes	Yes	Tablets as Innovative (MA-IA++)
English	9	4.00	Yes	Yes	Yes	Neutral	Neutral	Tablets as Innovative (MA-IA++)

Table 31: Summary of subject Teachers' Envisaged views of tablets as an Innovative technology

4.2.2.3 Summary of Manner of Adoption

Using the summary scores of Manner of Product (MA-P) and Manner of Idea (MA-I), I am now in a position to construct a view of different subject teachers' views, as to their current and envisaged future use of tablets as a support or innovation technology. All questions related to this construct were combined to calculate an overall median for this construct. Using the median scores as a guide of Manner of Adoption (MA) the following scoring system, seen in table 32, was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores

of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	CURRENT MA-P	CURRENT MA-I	CURRENT Support/ Innovation (MA-P/ MA-I)	FUTURE MA-P	FUTURE MA-I	ENVISAGED Support/Innovation (MA-P or MA-I)
NS	2	2.50	3.00	MA-PC-/MA-IC	3.00	3.00	MA-PE/MA-IE
Art	4	2.50	3.00	MA-PC-/MA-IC	3.00	3.00	MA-PE/MA-IE
2nd Language	7	3.00	3.00	MA-PC/MA-IC	3.00	3.00	MA-PE/MA-IE
English	9	3.50	4.00	MA-PC+/MA-IC++	4.00	4.00	MA-PE++/ MA-IE++
Maths	10	3.75	4.00	MA-PC+/MA-IC++	4.00	4.00	MA-PE++/ MA-IE++
EMS	5	4.00	4.00	MA-PC++/MA-IC++	4.00	4.00	MA-PE++/ MA-IE++
SS	7	4.00	4.00	MA-PC++/MA-IC++	4.00	4.00	MA-PE++/ MA-IE++

Table 32: Teachers' Current and Envisaged Manner of Adoption of Tablet Technology – Median Values

Overall, teachers' envisage that in the future their views of tablets in the classroom, either as a support or innovation tool, will be more positive than their current views. NS and Art teachers currently disagree that tablets are a support in the classroom, and are neutral or undecided as to their usefulness for pedagogic innovation and reorientation, however in the future they are neutral on both. 2nd Language teachers hold neutral views as to the usefulness of tablets in the classroom and have similar current and future views. English and Maths teachers have mixed views in relation to the current use of tablets in the classroom, while they believe that in the future, tablets will be utilised in both a supporting and reorientation role. EMS and SS teachers believe tablets currently support their role in the classroom, as well as enable them to reorientate and innovate their pedagogic practice, in the future they envisage they will do the same.

4.2.3 Adoption Activity (AA-H, AA-C and AA-E)

For the purposes of the data analysis, teachers' Adoption Activities, which refers to teachers' accounts of the types and frequency of activities they currently utilize and envisage using tablet technology for in the classroom, have been categorised into three groups. Teacher's horizontal proficiency (AA-H) assesses whether teachers are able to utilize tablet technology within their everyday life for non-school related tasks; Current pedagogical activities (AA-C) investigates which activities and how often teachers report they are currently using tablet technology in the classroom; Envisaged pedagogical activities (AA-E) assesses which activities and how often teachers envisage that in the future, they will use tablet technology in their teaching.

4.2.3.1 Horizontal Adoption Activities (AA-H)

4.2.3.1.1 Current Horizontal Adoption Activities (AA-HC) [49]

In order to assess teachers' ***current*** accounts of their comfort when using tablet technology for horizontal activities, the following statements were posed: (q19) *I am comfortable with using tablet technology in my everyday life for my own personal needs;* (q37) *I have had to expend considerable effort to become comfortable with using tablet technology in my everyday life* and (q38) *in general I am comfortable with new technologies*.

Subject	Number in Group (n)	Q19 Comfort using tablets in everyday	Q37 Considerable effort to become comfortable	Q38 General comfort with technology
EMS	5	**5.00**	**2.50**	**4.50**
Maths	10	4.50	2.00	4.00
SS	7	4.00	2.00	5.00
Art	4	4.00	2.00	4.00
2nd Language	7	4.00	2.00	4.00
English	9	**3.00**	**3.00**	**4.00**
NS	2	**3.50**	**3.00**	**3.50**

Table 33: Subject teachers' accounts of Current Horizontal (everyday) Adoption Activities (AA-H) (q19, q37[50], q38[51]) – Median Values

Some NS teachers are unsure as to their comfort and current use of tablet technology in their everyday lives and effort they have had to expend, however large variations within this subject group (q37IQRNS=2.00, q36IQRNS=2.00), indicates the presence of diverse opinions. English teachers are also unsure as to their comfort with using tablet technology in their everyday lives and hold diverse opinions (q19IQREng=2.50), they report they are comfortable with new technologies, but are unsure as to the amount of effort expended.

Art, Maths and SS teachers report in general to be comfortable with new technologies, using tablets in their everyday lives, and do not think considerable has been required, however diverse opinions are evident in relation to effort required (q37IQRArt=1.50, q37IQRMaths=1.75, q37IQRSS=1.50). 2nd Language teachers are unanimous as to their general comfort with technology and tablet use in their everyday lives being positive, but are unsure as to the amount of effort that has been expended. EMS teachers are united in their opinions as to their general comfort with new technologies and their use in everyday life, however diverse views are evident (q37IQREMS=1.25) in relation to the amount of effort that has been expended.

[49] As some questions related to current and envisaged AA-H have been presented earlier on in this chapter, only median scores will be reported. Where appropriate Mode and IQR statistics will be placed in the paragraph text.
[50] For question 37 a response of 4 or 5=suggests teachers have put in large amounts of effort in using tablets in their everyday life; 1 or 2=suggest they have not.
[51] For question 19 and question 38, a response of 4 or 5=suggests teachers are comfortable with new technology and specifically the tablet in their everyday life; 1 or 2=suggests they are not.

Age and Experience

Teachers with less teaching experience, in the 1-5 year category (n=3), report they are comfortable using tablets in their everyday life (q19Median1-5=4.5, q19Mode1-5=5.00), whereas more experienced teachers in the 31+ year category (n=5), are unsure (q19Median31+=3.00, q19Mode31+=3.00).

4.2.3.1.2 Envisaged Horizontal Adoption Activities (AA-HE)[52]

Overall, teachers do not envisage that in the future, more effort will be required to use tablets in their everyday lives; however Art, EMS and English think that in the future, more effort will be needed. Teachers' age and years of experience appear to play a role. Younger teachers in the 21-25 age category (n=3), and teachers with less experience in the 1-5 year category (n=3), do not believe that in the future, they will need to expend any effort to become comfortable with using tablets in their everyday lives (q56Mode21-25=1.00, q56Mode1-5=1.00), whereas older teachers in the 55+ age category (n=7), with more experience in the 31+ year category (n=5), are undecided (q56Mode55+=3.00, q56Mode31+=3.00).

4.2.3.2 Summary of Horizontal Adoption Activities (AA-H)

I am now in a position to construct a view of different subject teachers' current and envisaged use of tablet technology for horizontal use (AA-H). All questions related to this construct were combined to calculate an overall median for this construct. Using the median scores as a guide of horizontal adoption activities (AA-H), the following scoring system, seen in table 37, was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

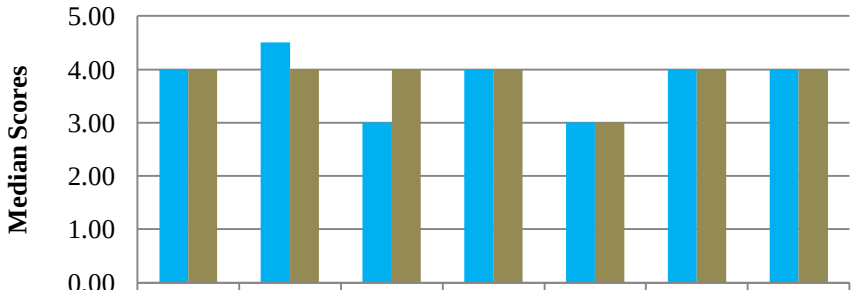
Subject	Number in Group (n)	CURRENT AA-H	FUTURE AA-H	Horizontal Adoption Activities (AA-H) CURRENT/ENVISAGED
NS	2	3.00	3.00	AAH-H-C/AA-H-E
English	9	3.00	4.00	AAH-H-C/AA-H-E++
2nd Language	7	4.00	4.00	AAH-H-C++/AA-H-E++
SS	7	4.00	4.00	AAH-H-C++/AA-H-E++
Art	4	4.00	4.00	AAH-H-C++/AA-H-E++
Maths	10	4.00	4.00	AAH-H-C++/AA-H-E++
EMS	5	4.50	4.00	AAH-H-C++/AA-H-E++

Table 34: Teachers' Current and Envisaged Horizontal Activities – Median Values

Teachers in general think that their current use of tablets in their everyday lives, has not required considerable effort, and except for English and NS teachers, all other teachers report they are

[52] Survey questions and detailed findings on teachers' accounts of envisaged horizontal use can be found in table AE4

comfortable with using tablets in a horizontal manner. English teachers envisage that in the future they will be more comfortable using tablets in this manner, however considerable effort may be required. Art and EMS teachers also think that in the future, more effort will be required, all other teachers report similar beliefs about future and present use. The amount of teaching experience appears to make a difference relative to current use, whereas in the future the combination of age and experience appears to be important, less experienced and younger teachers believe that in the future, tablet use within their everyday lives, will require almost no effort, older and more experienced teachers are neutral.



	Art (n=4)	EMS (n=5)	English (n=9)	Maths (n=10)	NS (n=4)	2nd Lang	SS (n=7)
Current Horizontal Activities	4.00	4.50	3.00	4.00	3.00	4.00	4.00
Envisaged Horizontal Activities	4.00	4.00	4.00	4.00	3.00	4.00	4.00

Figure 14: Subject teachers' accounts of Current and Envisaged Horizontal Adoption Activities (AA-HC and AA-HE)

4.2.3.3 Teaching Adoption Activities (AA-C and AA-E)

4.2.3.3.1 Current Teaching Adoption Activities (AA-C) [53]

To assess teachers' ***current*** comfort with using tablet technology for teaching in the classroom, the following statements were posed: (q27) *I am comfortable using tablet technology for productivity related tasks in the classroom*; (q36) *I use tablet technology in my teaching because I find tablets easy to use*; (q39) *I have had to expend considerable effort to become comfortable with using tablet technology in my current teaching and (q56) in general I am comfortable with these new technologies.*

[53] As some of the questions related to AA-C and AA-E have been presented earlier on in this chapter, only median scores will be reported. Where appropriate Mode and IQR statistics will be placed in the paragraph text.

Subject	Number In Group (n)	Q27 Comfortable using tablets for classroom productivity	Q36 Find tablets easy to use	Q39 Have had to expend considerable effort to become comfortable in my teaching	Q56 General comfort with these new technology
SS	7	**5.00**	4.00	3.00	4.00
EMS	5	**4.50**	4.00	3.00	4.00
Maths	10	4.00	4.00	2.50	4.00
English	9	4.00	4.00	3.00	4.00
2nd Language	7	4.00	**3.00**	3.00	4.00
Art	4	**3.50**	**3.00**	3.00	**4.00**
NS	2	**3.50**	**3.00**	4.00	**2.50**

Table 35: Subject teachers' accounts of their Current Teaching Adoption Activities (AA-C) (q27, q36, q39[54], q56[55]) - Median Values

NS teachers report they are comfortable using tablets for productivity related tasks in the classroom, however they are unsure about using tablets in general, and more specifically for their own teaching. In addition, they believe they have expended considerable effort. All other teachers are undecided as to the effort that has been required, and consequently diverse opinions are apparent within EMS (q39IQREMS=2.25), English (q39IQREng=1.50) and SS (q39IQRSS=1.50) subject groupings.

Except for Art and NS teachers (as mentioned previously), all other teachers report they are comfortable using tablets for productivity related tasks in the classroom, however large variations of opinions are evident within the English (q27IQREng=1.50), Maths (q27IQRMaths=1.75) and SS (q27IQRSS=1.50) subject groupings.

All teachers, with the exception of NS teachers, report they are comfortable with new technologies. Art and 2nd Language teachers are unsure as to whether they use tablets in the class because they find tablets easy to use, all other teachers agree with this statement.

Age and Experience

A combination of teacher's age and years of experience, irrespective of subject taught, appears to influence opinions in relation to the amount of effort expended and using tablets for productivity related classroom activities. Younger teachers in the 21-25 age category (n=3), and teachers with less experience in the 1-5 year category (n=3), believe they are comfortable using tablets for productivity related tasks in the classroom (q27Median21-25=5.00, q27Mode1-5=5.00) and do not think that they have had to expend considerable effort (q39Median21-25=2.00, q621-5=2.00), whereas the majority of older teachers in the 55+ age category (n=7), with more experience in the 31+ year category (n=5), are unsure about using tablets for productivity related tasks in the classroom (q27Median55+=3.00,

[54] For q39 a response of 4 or 5=suggests teachers have had to put in large amounts of effort to become comfortable with using the tablet in their teaching; 1 or 2 suggests that it was a relatively painless transition.
[55] For q27, q36 and q56 a response of 4 or 5=suggests teachers are comfortable with tablets and other new technologies in their teaching; 1 or 2=suggests they are not.

q27Median31+=3.00) and think that they have had to expend considerable effort (q39Mode55+=4.00, q39Mode31+=4.00).

4.2.3.3.2 Envisaged Teaching Adoption Activities (AA-E)[56]

Maths and Art teachers envisage that in the future, large amounts of effort will be required to become comfortable with using tablets for teaching, SS and 2nd Language teachers are unsure, and EMS, English, and NS teachers envisage that the transition will be relatively seamless. 2nd Language and SS teachers hold similar views in relation to current and envisaged future effort. EMS and English teachers, envisage more effort will be required, whereas Maths teachers believe slightly less effort will be needed. Large variations are evident amongst all subject groupings, which indicate a lack of consensus amongst teachers within the same subject group.

Age and Experience

A combination of teachers' age and experience seems to influence the amount of effort teachers envisage will be needed in the future, to be comfortable with using tablets for teaching. Teachers with little experience in the 1-5 year category (n=3), and teachers with lots of experience in the 31+ year category (n=5), envisage that in the future, teaching with tablets will require them to expend considerable effort (q48Mode1-5=4.00, q48Mode31+=4.00), whereas younger teachers in the 21-25 age category (n=3) think they will have to expend less effort (q48Mode55+=4.00).

4.2.3.4 Summary of Current and Envisaged Teaching Adoption Activities (AA-C and AA-E)

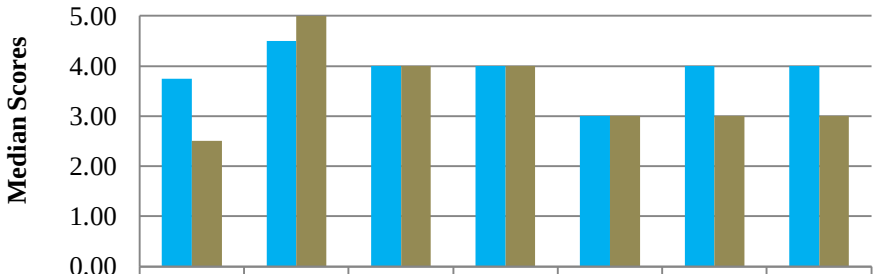
I am now in a position to construct a view of different subject teachers' accounts of their current and envisaged use of tablet technology for teaching activities (AA-C and AA-E). All questions related to this construct were combined to calculate an overall median for this construct. Using the median scores as a guide of current and envisaged teaching activities (AA-C and AA-E), the following scoring system, seen in table 36, was developed. Median scores of 1.00-1.99 were scored as very weak (- -); scores of 2.00-2.99 were scored as weak (-); scores of 3.00-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and over were scored as very strong (++).

Subject	Number in Group (n)	CURRENT AA-C	FUTURE AA-C	Teaching Adoption Activities (AA-C/AA-E) CURRENT/ENVISAGED
NS	2	3.00	3.00	AA-C/AA-E
Art	4	3.75	2.50	AA-C+/AA-E-
SS	7	4.00	3.00	AA-C++/AA-E
2nd Language	7	4.00	3.00	AA-C++/AA-E
EMS	5	4.50	5.00	AA-C++/AA-E++
Maths	10	4.00	4.00	AA-C++/AA-E++
English	9	4.00	4.00	AA-C++/AA-E++

Table 36: Teachers' Current and Envisaged Teaching Adoption Activities (AA-C and AA-E) – Median Values

[56] Survey questions and detailed findings on teachers' accounts of envisaged teaching adoption activities can be found in table AE5.

At the present time, only Art and NS teachers report they are not making use of tablets in their teaching, all other teachers report they are. In the future, except for NS teachers, all other teachers believe using tablets for teaching will be beneficial, however largely diverse opinions are evident in relation to the amount of effort that will be required. These variations make it difficult to interpret these findings with any degree of clarity. Age and teaching experience appear to be relevant, with both more and less experienced teachers thinking that teaching with tablets in the future, will require effort.



	Art (n=4)	EMS (n=5)	English (n=9)	Maths (n=10)	NS (n=4)	2nd Lang	SS (n=7)
Current Teaching Activities	3.75	4.50	4.00	4.00	3.00	4.00	4.00
Envisaged Teaching Activities	2.50	5.00	4.00	4.00	3.00	3.00	3.00

Figure 15: Subject teachers' accounts of Current and Envisaged Teaching Adoption Activities (AA-C and AA-E)

4.2.3.5 Types and Frequency of Teaching Adoption Activities (AA-C and AA-E)

The Likert scale used to capture teachers' accounts of types and frequency of teaching adoption activities differs from the rest of the survey: 1-Never; 2-Every few months; 3-Monthly; 4-Weekly; 5-Daily.

4.2.3.5.1 Current Types and Frequency of Teaching Adoption Activities (AA-C)[57]

Due to the large number of questions related to teachers' accounts of the extent and frequency of their current teaching related activities being performed with tablets, and to simplify the survey analysis, similar questions that measure the same aspects of the construct have been grouped together.

For ***Internet Access*** (q59a*) accessing the internet to look up general information related to the knowledge that you are teaching* and (q59b) *accessing the internet to show a video related to the knowledge that you are teaching.* For **Practice *of skills*** (q60a) *drill and practice* and (q60b) *creating online assessments and quizzes for learners*. For ***Explaining new concepts and creating relevance*** (q61a) *teaching new concepts*; (q61b) *creating relevance to specialised knowledge* and (q61c) *simulations and project based work. For* ***Classroom Productivity Enhancement*** (q62a) *creating and showing presentations to learners*; (q62b) *posting class notes or recording of classes*; (62c) *sending email communication to learners and parents*; (q62d) *creating or uploading notes* and (q62e) c*reating*

[57] For all questions related to AA-C a response of 4 or 5=suggests teachers make frequent use of the tablet for the specified activity; 1 or 2=suggests teachers seldom or never make use of the tablet in this regard.

a video to enable your teaching. For ***Facilitation of collaborative learning*** (q63a) *enabling learners to create online content through wikis or blogs* and (q63b) *enabling collaboration of learning amongst your learners and their peers.*

Internet Access

Subject	Number in Group (n)	Q59a Median General Info	Q59a Mode	Q59a IQR	Q59b Median Show videos	Q59b Mode	Q59b IQR
EMS	5	5.00	4.50	0.00	4.50	4.00	**1.25**
English	9	5.00	5.00	0.00	4.00	4.00	0.75
Art	4	5.00	5.00	0.75	4.00	4.00	0.50
2nd Language	7	5.00	4.00	1.00	4.00	4.00	0.25
SS	7	5.00	5.00	1.00	**3.00**	3.00	1.00
NS	2	4.50	5.00	1.00	**3.50**	4.00	**1.25**
Maths	10	4.50	5.00	1.00	4.00	4.00	1.00

Table 37: Subject teachers' accounts of Current use of tablets for teaching activities – Internet access (AA-C) (q59a, q59b) –Median, Mode and IQR Values

All teachers, across all subjects, are unanimous about using tablets daily for looking up general information related to their teaching. NS and SS teachers access the internet infrequently for related videos, while all other teachers access the internet weekly for related videos.

Practice of Skills

Subject	Number in Group (n)	Q60a Median Drill and Practice	Q50a Mode	Q60a IQR	Q60b Median Online quizzes and assessments	Q60b Mode	Q60b IQR
EMS	5	**5.00**	5.00	0.25	**3.50**	1.50	**1.25**
Maths	10	**4.00**	4.00	1.00	1.50	1.00	**1.75**
2nd Language	7	3.00	2.00	**2.00**	2.00	1.00	**2.25**
NS	2	2.50	2.00	1.50	1.50	1.00	**1.50**
English	9	2.00	2.00	0.75	2.00	1.00	**1.50**
SS	7	2.00	1.00	**2.00**	1.00	1.00	1.00
Art	4	2.00	1.00	**2.25**	1.00	1.00	0.00

Table 38: Subject teachers' accounts of Current use of tablets for teaching activities – Practice of skills (AA-C) (q60a, q60b) – Median, Mode and IQR Values

Maths and EMS teachers report they use tablets frequently for drill and practice, whereas all other teachers report they are not using tablets for this purpose. Diverse opinions are evident within the most of the subject groupings, except for EMS and English teachers. In relation to using tablets for the creation of online assessments, the majority of teachers report they use this function infrequently, whereas EMS teachers report they make use of this capability a number of times during the month. However, large variations within all subject groupings, except Art, indicate diverse opinions.

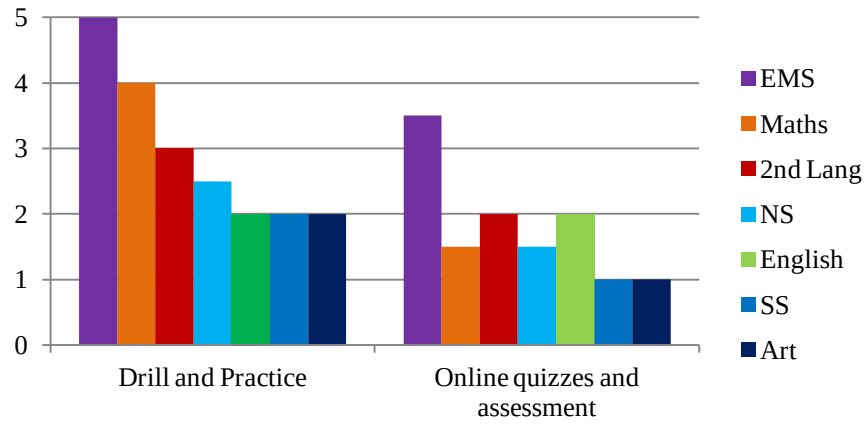


Figure 16: Comparison of teachers' accounts of Current use of tablets for drill and practice (q60a) and online quizzes (q60b) – Median Scores

Explaining new concepts and showing relevance[58]

Subject	Number in Group (n)	Q61a Median New concepts	Q61a IQR	Q61b Median Creating relevance	Q61b IQR	Q61c Median Simulations and project work	Q61c IQR
EMS	5	4.00	0.25	3.50	**1.25**	3.50	1.00
2nd Language	7	4.00	0.75	4.00	1.00	3.00	0.50
English	9	4.00	0.75	4.00	0.00	**4.00**	0.75
Maths	10	4.00	1.00	4.00	**1.75**	**2.00**	**1.75**
NS	2	3.00	**2.25**	3.50	**1.50**	**4.00**	0.00
SS	7	3.00	1.00	4.00	**2.00**	3.00	**1.50**
Art	4	3.00	0.75	3.50	**1.25**	**1.00**	**1.50**

Table 39: Subject teachers' accounts of Current use of tablets for teaching activities – new concepts and relevance (AA-C) (q61a, q61b, q61c) – Median and IQR Values

English, Maths, EMS and 2nd Language teachers report they use tablets on a weekly basis to teach new concepts and create relevance to specialised knowledge, while Art, NS and SS teachers report they use tablet less frequently for these types of activities. Maths, NS and EMS teachers report they use tablets for simulations and project work on a weekly basis, 2nd Language and SS teachers more than once a month, Maths teachers once a month, and Art teachers never . Diverse views are evident within the subject groupings of Art, Maths and SS.

[58] Due to the number of questions associated with this sub-section, only Median and IQR statistics will be shown, where relevant, Mode will be mentioned in the paragraph text.

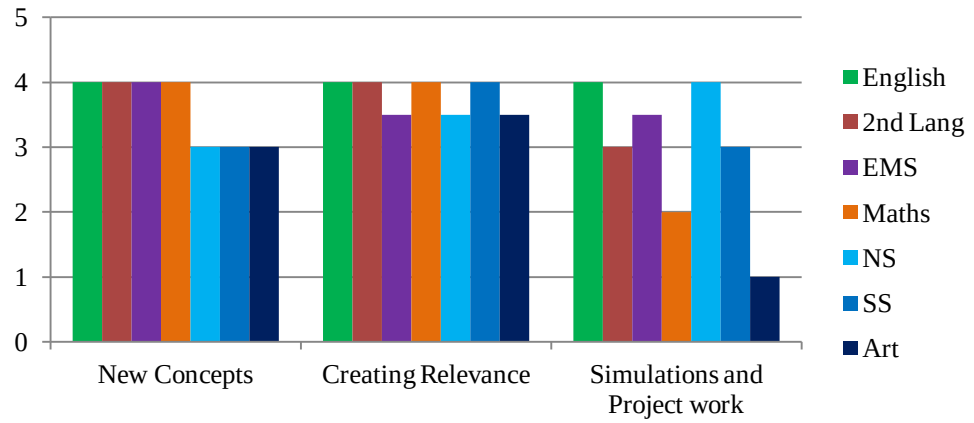


Figure 17: Comparison of teachers' accounts of Current use of tablets for explaining new concepts (q61a), creating relevance (q61b) and simulations and projects (q61c) - Median Scores

Classroom Productivity Enhancement[59]

Subject	Number in Group (n)	Q62a Creating and showing presentations	Q62b Posting and recording class notes	Q62c Sending email communication	Q62d Creating and uploading notes	Q62e Creating videos to enable teaching
EMS	5	4.00	4.00	4.00	4.00	2.50
2nd Language	7	4.00	**3.00**	4.00	3.50	1.00
English	9	4.00	**3.00**	5.00	4.00	2.00
Maths	10	4.00	4.50	4.00	3.50	1.50
NS	2	5.00	**3.00**	3.50	**2.50**	1.00
SS	7	4.00	**3.00**	3.00	4.00	1.00
Art	4	4.00	**2.00**	**2.00**	**2.00**	1.00

Table 40: Subject teachers' accounts of Current use of tablets for teaching activities – Classroom productivity enhancement (AA-C) (q62a-62e) – Median Values

All teachers report they use tablets on a weekly or daily basis to create and show presentations, however, diverse opinions are evident within the subject grouping of Maths (q62aIQRMaths=1.75).

The ability to post and upload class notes using the tablet, was reported to be most frequently used by Maths and EMS teachers, however diverse opinions are present within the subject grouping of Maths (q62bIQRMaths=2.75, q62dIQRMaths=1.75). Art teachers report they post and upload notes very infrequently, but diverse opinions are evident within this subject grouping (q62bIQRArt=2.50).

All teachers, except for Art and SS teachers, report using tablets for email communication on a weekly or daily basis. Except for EMS and English teachers, who report they infrequently use tablets to create videos to enable their teaching, all other teachers report they make use of this function.

[59] Due to the number of questions associated with this sub-section, only Median scores will be shown, where relevant, Mode and IQR will be mentioned in the paragraph text.

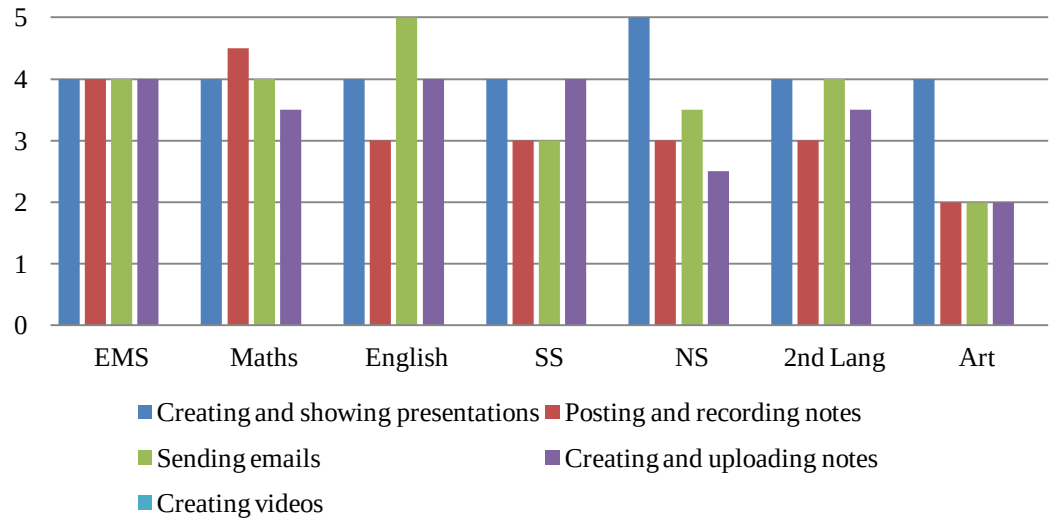


Figure 18: Comparison of teachers' accounts of Current use of tablets for classroom productivity (q62a-62e) - Median Scores

Facilitation of Collaborative Learning

Subject	Number in Group (n)	Q63a Median Learners creating online content and wikis	Q63a Mode	Q63a IQR	Q63b Median Enabling collaboration	Q63b Mode	Q63b IQR
EMS	5	**3.00**	1.00	**2.25**	**3.50**	2.00	1.00
2nd Language	7	2.00	1.00	**2.25**	2.50	1.00	**3.00**
English	9	2.00	2.00	**1.50**	**3.00**	3.00	1.00
Maths	10	1.50	1.00	1.00	2.00	1.00	**2.75**
NS	2	1.00	1.00	0.75	**3.50**	4.00	**1.50**
SS	7	1.00	1.00	1.00	2.00	2.00	1.00
Art	4	1.00	1.00	0.00	2.50	2.00	**1.50**

Table 41: Subject teachers' accounts of Current use of tablets for teaching activities – collaborative learning (AA-C) (q63a, q63b) – Median, Mode and IQR Values

EMS, English and 2nd Language teachers report they infrequently use tablets to enable learners to create wikis or blogs, all other teachers report they never use tablets for this type of activity. Largely diverse views are evident within the subject groupings of EMS, English and 2nd Language teachers. Therefore it seems as if subject taught alone does not account for teachers' views in relation to tablets, in the creation of online learner content.

All teachers report they make some use of tablets to enable learner collaboration, with EMS, English and NS teachers reporting they make use of the tablet monthly, in this regard. Large variations are evident within Art, Maths, NS and 2nd Languages subject groupings, which indicate diverse opinions.

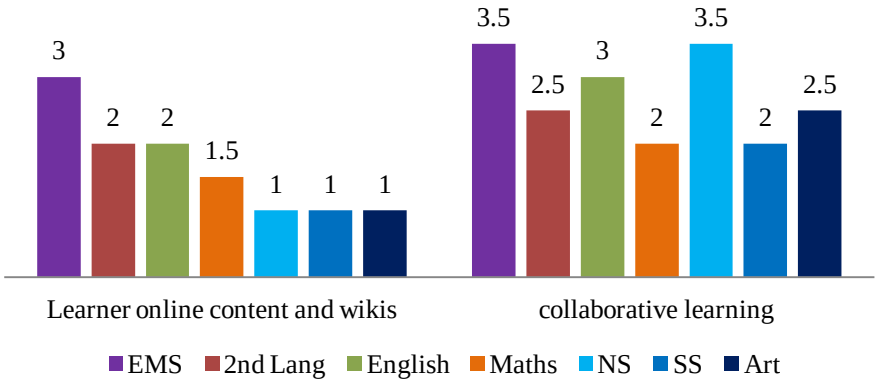


Figure 19: Comparison of teachers' accounts of Current use of tablets for collaborative learning (q63a, q63b) - Median Scores

Age and Experience

When grouping data on teacher's age and years of experience, irrespective of subject, teachers with more years of experience in the 31+ year category (n=5) report they are using tablets for drill and practice on a weekly basis (q60aMedian31+=4.00), whereas teachers with less experience in the 1-5 years category (n=3), report they almost never use tablets in this regard (q60aMedian1-5=1.50). However, large variations within the years of teaching experience groupings seems to indicate that teaching experience alone does not account for differences. The creation and showing of presentations to learners, was reported to be used, at least once a week (q62aMedian55+=4.00) by older teachers in the 55+ age category (n=7), and less frequently by younger teachers (q62aMedian21-25=2.00) in the 21-25 age category (n=3).

4.2.3.5.2 Summary Current Types and Frequency of Teaching Adoption Activities (AA-C)

Using the summary scores of the activity sub-groups, I am now in a position to construct a composite score that may enable a comparative view of teachers' account of the frequency and extent they make use of tablets. Median scores across each type of activity were then calculated. Using median scores as a guide, the following scoring code has been developed: median scores of 1.00-1.49 imply teachers almost never use tablets for this function (- -); scores of 1.50-2.49 suggest teachers seldom use this function (-); scores of 2.50-3.49 suggest teachers sometimes use these functions; scores of 3.50-4.49 suggest teachers make use of this function often (+); and scores of 4.50 and over suggest teachers make very frequent use of this function (++). Using this scoring code, the frequency and extent of tablet use by teachers in the classroom was obtained by calculating the net scores in each subject grouping. Findings are displayed in the table 42 below.

Subject	Number in Group (n)	Internet Access	Practice of Skills	Explaining New Concepts and Showing Relevance	Classroom Productivity Enhancement	Facilitation of Collaborative Learning	Types of Adoption Activities CURRENT
Art	4	Very Often	Seldom	Sometimes	Seldom	Seldom	AA-C-
SS	7	Very Often	Seldom	Sometimes	Sometimes	Seldom	AA-C-
NS	4	Very Often	Seldom	Often	Sometimes	Seldom	AA-C+
2nd Language	7	Often	Sometimes	Often	Often	Seldom	AA-C++
English	9	Often	Seldom	Often	Often	Sometimes	AA-C++
Maths	10	Often	Sometimes	Often	Often	Seldom	AA-C++
EMS	5	Often	Often	Often	Often	Sometimes	AA-C++++

Table 42: Teachers' Current Types and Frequency of Teaching Adoption Activities

As seen from Table 42, EMS teachers report they make the most frequent and extensive use of the tablets in relation to teaching and productivity in the classroom. Maths and English teachers also report they make frequent and extensive use of tablets for teaching, whereas NS, 2nd Language and SS teachers report they make less regular and extensive use of tablets, and Art teachers report they make the least and most limited use of tablets in the classroom.

Almost all teachers report making use of the internet for looking up information, accessing online videos, showing presentations to learners, and email communication. Maths and EMS teachers report using tablets for drill and practice, while most of the other teachers report they do not make frequent use of this function. In addition, English and EMS teachers report they make frequent use of tablets to create videos to enable their teaching, facilitate relevance of subject knowledge and enable collaboration amongst their learners. Simulations are reported to be used by Maths, EMS and NS teachers, whereas the creation of online assessments appears to be used only by EMS teachers. 2nd Language and Maths teachers report they use tablets to create relevance for their learners. Teachers with more experience, report they use tablets to enable drill and practice sessions, and less experienced teachers report they use tablets less frequently, than older teachers in relation to presentation creation.

4.2.3.5.3 Envisaged Types and Frequency of Teaching Adoption Activities (AA-E)[60]

Due to the large number of questions related to teachers' accounts of the extent and frequency of teaching related activities, which teachers envisage that in the future they will use tablets for, and to simplify the survey analysis, similar questions that measure the same aspects of the construct have been grouped together.

[60] For all questions related to AA-E a response of 4 or 5=suggests teachers expect that in the future they will make frequent use of the tablet for the specified activity; 1 or 2=suggests teachers expect that in the future they will seldom make use of the tablet in this regard.

For ***Internet Access*** (q59a*) accessing the internet to look up general information related to the knowledge that you are teaching* and (q59b) *accessing the internet to show a video related to the knowledge that you are teaching.* For ***Practice of skills*** (q60a) *drill and practice* and (q60b) *creating online assessments and quizzes for learners*; ***Explaining new concepts and creating relevance*** (q61a) *teaching new concepts*; (q61b) *creating relevance to specialised knowledge* and (q61c) *simulations and project based work. For **Classroom Productivity Enhancement*** (q62a) *creating and showing presentations to learners*; (q62b) *posting class notes or recording of classes*; (62c) *sending email communication to learners and parents*; (q62d) *creating or uploading notes* and (q62e) c*reating a video to enable your teaching.* For ***Facilitation of collaborative learning*** (q63a) *enabling learners to create online content through wikis or blogs* and (q63b) *enabling collaboration of learning amongst your learners and their peers.*

Internet Access

Subject	Number in Group (n)	Q59a Median General Info	Q59a Mode	Q59a IQR	Q59b Median Show videos	Q59b Mode	Q59b IQR
Maths	10	5.00	5.00	1.00	4.00	4.00	1.50
Art	4	5.00	5.00	0.25	4.50	4.00	1.00
English	9	5.00	5.00	0.00	4.00	4.00	1.00
NS	2	4.50	5.00	**1.50**	4.00	4.00	0.75
EMS	5	4.00	4.00	1.00	4.00	4.00	0.00
2nd Language	7	4.00	4.00	0.00	3.00	2.00	**1.50**
SS	7	4.00	4.00	1.00	4.00	400	1.00

Table 43: Subject teachers' accounts of Envisaged use of tablets for teaching activities - Internet access (AA-E) (q59a, q59b) – Median, Mode and IQR Values

Teachers across all subjects, report that in the future they still expect to use tablets for accessing the internet to obtain general information and online videos, with most teachers reporting they envisage they will use tablets, daily, for these purposes. Disparate views are evident within English and NS subject groupings.

Practice of Skills

Subject	Number in Group (n)	Q60a Median Drill and Practice	Q60a Mode	Q60a IQR	Q60b Median Online quizzes and assessments	Q60b Mode	Q60b IQR
EMS	5	4.00	4.00	0.00	**4.00**	3.00	1.00
Maths	10	4.00	4.00	0.75	3.00	3.00	1.00
2nd Language	7	4.00	4.00	2.00	3.00	3.00	1.50
NS	2	**3.50**	4.00	1.50	2.50	1.00	3.00
English	9	**3.00**	2.00	1.00	3.00	2.00	1.00
SS	7	**3.00**	1.00	2.50	3.00	4.00	2.00
Art	4	**2.00**	1.00	2.25	3.00	3.00	0.25

Table 44: Subject teachers' accounts of Envisaged use of tablets for teaching activities – Practice skills (AA-E) (q60a, q60b) – Median, Mode and IQR Values

Maths and EMS teachers envisage that in the future, they will still use tablets frequently for drill and practice and English, NS and SS teachers expect that in the future, they will move towards more frequent use. Art teachers believe their use of tablets for this purpose will remain unchanged. Creating online assessments for learners is a function that, all teachers across all subjects, envisage in the future they will use more frequently than they currently do.

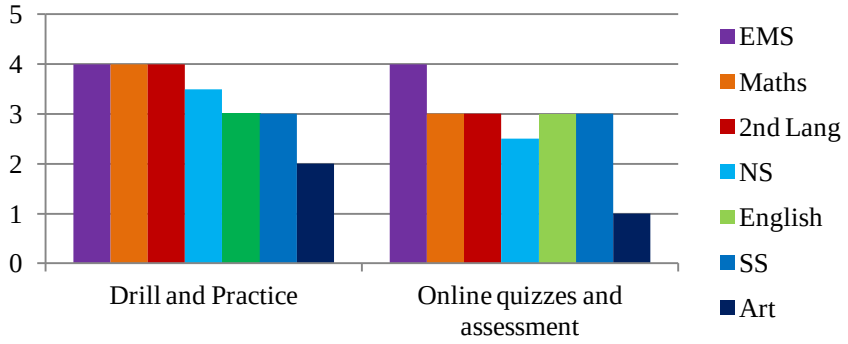


Figure 20: Comparison of teachers' accounts of Envisaged use of tablets for drill and practice (q60a) and online quizzes (q60b) – Median Scores

Explaining new concepts and showing relevance[61]

Subject	Number in Group (n)	Q61a Median New concepts	Q61a IQR	Q61b Median Creating relevance	Q61b IQR	Q61c Median Simulations and project work	Q61c IQR
EMS	5	4.00	1.00	4.00	0.00	**4.00**	0.00
2nd Language	7	4.00	1.00	3.00	1.00	3.00	1.00
Maths	10	4.00	0.00	4.00	0.75	3.00	0.75
NS	2	4.00	0.75	4.00	0.50	3.00	0.50
SS	7	4.00	1.00	4.00	2.00	3.00	2.00
Art	4	4.00	0.25	4.00	0.00	**4.00**	0.75
English	9	3.00	1.00	4.00	0.00	3.00	1.00

Table 45: Subject teachers' accounts of Envisaged use of tablets for teaching activities – New concepts and relevance (AA-E) (q61a, q61b, q61c) – Median, Mode and IQR Values

For teaching new concepts all teachers, except for English, report they will make more frequent use of tablets in teaching new concepts than they currently do. In addition, except for 2nd language, teachers report they expect that in the future, they will use tablets weekly to create relevance for their subject knowledge. In respect to using tablets for simulations, Art teachers report that in the future they will shift from currently never using this function, to using it weekly, whilst most other teachers report they expect they will use tablets for this purpose a few times a month.

[61] Due to the number of questions associated with this sub-section only Median and IQR statistics will be shown, where relevant Mode will be mentioned in the paragraph text.

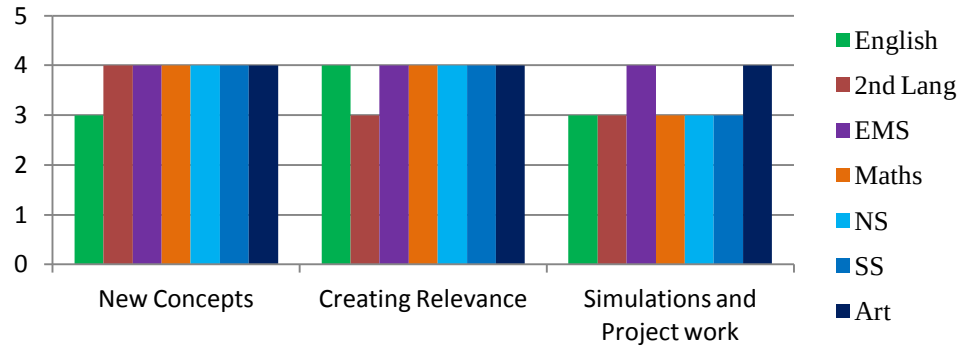


Figure 21: Comparison of teachers' accounts of Envisaged use of tablets for explaining new concepts (q61a), creating relevance (q61b) and simulations and projects (q61c) – Median Values

Classroom Productivity Enhancement[62]

Subject	Number in Group (n)	Q62a Creating and showing presentations	Q62b Posting and recording class notes	Q62c Sending email communication	Q62d Creating and uploading notes	Q62e Creating videos to enable teaching
NS	2	4.50	**3.00**	**3.50**	**3.00**	2.50
EMS	5	4.00	4.00	4.00	4.00	**4.00**
English	9	4.00	4.00	4.00	**3.00**	2.00
SS	7	4.00	4.00	4.00	4.00	3.00
Art	4	4.00	4.50	4.00	4.00	2.50
Maths	10	**3.00**	4.50	4.00	4.00	3.00
2nd Language	7	**3.00**	**3.00**	4.00	4.00	2.00

Table 46: Subject teachers' accounts of Envisaged use of tablets for teaching activities – Classroom productivity enhancement (AA-E) (q62a-62e) – Median Values

All teachers report they envisage that in the future, they will continue to use tablets frequently to create and show presentations, however Maths, NS and 2nd Language teachers envisage their future use will be less than it currently is. Largely diverse opinions are evident within the subject grouping of Maths (q62aIQREnvisagedMaths=1.50) and NS (q62aIQREnvisagedNS=1.75), which indicates varied opinions are present within these subject groupings.

Besides for Art, SS and English teachers who report that in the future they will make more frequent use of tablets to post their class notes, all other teachers report similar views in this regard. Similarly, Art and SS teachers also envisage that in the future their use of tablets to create and upload notes will increase, while English teachers envisage their future use will decrease.

For email communication, Art and SS teachers, envisage that in the future they will make more frequent use of tablets for communication, whereas English teachers envisage their future use will be less. Large variations are evident within the English subject grouping (q62cIQREnvisagedEng=2.25).

[62] Due to the number of questions associated with this sub-section only Median scores will be shown, where relevant Mode and IQR will be mentioned in the paragraph text.

Teachers from all subject groupings report that in the future, they will make more frequent use of tablets to create videos to enable their teaching, with EMS, Maths and SS teachers intending to use tablets most frequently for this purpose.

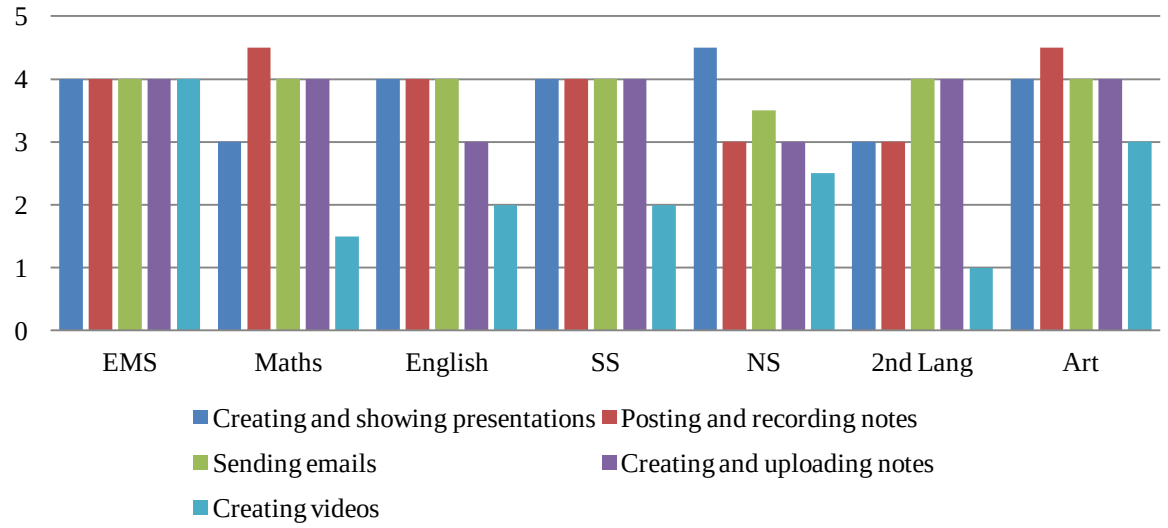


Figure 22: Comparison of teachers' accounts of Envisaged use of tablets for classroom productivity (q62a-62e) – Median Values

Facilitation of Collaborative Learning

Subject	Number in Group (n)	Q63a Median Learners creating online content and wikis	Q63a Mode	Q63a IQR	Q63b Median Enabling collaboration	Q63b Mode	Q63b IQR
EMS	5	4.00	3.00	1.00	4.00	3.00	0.00
2nd Language	7	3.00	1.00	**2.00**	3.00	2.00	**1.50**
English	9	3.00	2.00	**2.00**	4.00	4.00	1.00
Maths	10	3.00	4.00	**1.75**	3.00	3.00	1.00
NS	2	**1.50**	1.00	**1.25**	3.00	2.00	**2.50**
SS	7	**2.00**	2.00	**2.00**	4.00	4.00	1.00
Art	4	**2.50**	2.00	**1.50**	3.50	3.00	1.00

Table 47: Subject teachers' accounts of Envisaged use of tablets for teaching activities – Collaborative learning (AA-E) (q63a, q63b) – Median, Mode and IQR Values

Teachers across all subjects believe that in the future, they will make more use of tablets to enable online learner collaboration, however large variations within all subjects groupings, except for EMS teachers, indicates diverse views. Teachers envisage that in the future, they will make more frequent use of tablets to enable learner collaboration, with EMS, English and SS teachers believing they will use tablets the most. Variations amongst 2nd Language and SS teachers indicates diverse opinions.

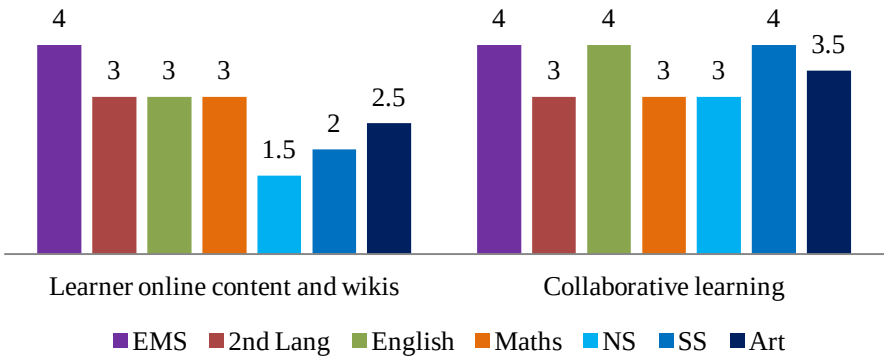


Figure 23: Comparison of teachers' accounts of Envisaged use of tablets for collaborative learning (q63a, q63b) - Median Values

Age and Experience

Teachers' age seems to be important in relation to the future use of tablets for creating and showing learners presentations. Younger teachers in the 21-25 category (n=3) believe that in the future, they will use tablets less frequently (q62aModeEnvisage21-25=2.00) for this purpose, than older teachers (q62aMedianEnvisage55+=4.00) in the 55+ age category (n=7).

4.2.3.5.4 Summary of Envisaged Types and Frequency of Teaching Adoption Activities (AA-E)

Using the summary scores of the activity sub-groups, I am now in a position to construct a composite score that may enable a comparative view of teachers' accounts of the frequency and extent they expect to use tablets. Median scores across each type and frequency of activity have been calculated. Using median scores as a guide, the following scoring code has been developed: median scores of 1.00-1.49 imply that teachers expect that in the future, they will almost never use tablets for this function (- -); scores of 1.50-2.50 suggest that teachers expect that in the future, they will seldom use tablets for this function (-); scores of 2.51-3.49 suggest that teachers expect that in the future, they will sometimes use tablets for this function; scores of 3.50-4.49 suggest that teachers expect that in the future, they will often use tablets for this function (+); and scores of 4.50 and over suggest that teacher expect that in the future, they will make very frequent use of tablets for this function (++). Using this scoring code, the envisaged extent and frequency of tablet use by teachers in the classroom was obtained by calculating the net scores in each subject grouping. Findings are displayed in the table 48.

Subject	Number in Group (n)	Internet Access	Practice of Skills	Explaining New Concepts and Showing Relevance	Classroom Productivity Enhancement	Facilitation of Collaborative Learning	Frequency and Extent of Use ENVISAGED
NS	4	Often	Sometimes	Often	Sometimes	Seldom	AA-E+
2nd Language	7	Often	Often	Sometimes	Sometimes	Sometimes	AA-E++
SS	7	Often	Sometimes	Often	Often	Sometimes	AA-E+++
Art	4	Very Often	Sometimes	Often	Often	Sometimes	AA-E++++
English	9	Very Often	Sometimes	Sometimes	Often	Often	AA-E++++
Maths	10	Very Often	Often	Often	Often	Sometimes	AA-E++++
EMS	5	Often	Often	Often	Often	Often	AA-E+++++

Table 48: Teachers' Envisaged Types and Frequency of Teaching Adoption Activities

As seen in table 48, all teachers, except for NS and 2nd Language teachers, are expecting in the future to use tablets very frequently and across a range of activities. Almost all teachers report that in the future, they will use tablets for looking up information on the internet, accessing online videos, showing presentations to learners and email communication. Maths and EMS teachers believe they will use tablets for drill and practice, whereas most of the other teachers do not intend to make frequent use of this function. English and EMS teachers report that in the future, they will make frequent use of tablets to create videos to enable their teaching, facilitate relevance of subject knowledge and enable collaboration amongst their learners. Simulations are expected to be used by Maths, EMS and NS teachers, whilst only EMS teachers expect to use tablets to create online assessments. 2nd Language and Maths teachers report that in the future, they will also use tablets to create relevance for their learners. Teachers with more experience envisage that in the future, they will use tablets to enable drill and practice, and less experienced teachers expect to use tablets less frequently than older teachers in relation to presentation creation.

4.2.3.6 Summary of Adoption Activities, Types and Frequency (AA-H, AA-C and AA-E)

Using the summary scores of Horizontal Adoption Activities (AA-H), Current Teaching Adoption Activities (AA-C) and Envisaged Teaching Adoption Activities (AA-E), I am now in a position to construct a composite score that may enable an overall view of Adoption Activities. Median scores across each of these constructs have been calculated. Using median scores as a guide, the following scoring code has been developed: median scores of 1.00-1.49 were scored as very weak (- -); scores of 1.50-2.49 were scored as weak (-); scores of 2.50-3.49 were scored as neutral; scores of 3.50-3.99 were scored as strong (+); scores of 4.00 and above were scored as very strong (++). Findings are displayed in the table 49.

Subject	Number (n)	CURRENT AA-H	AA-C General Teaching	AA-C Type of teaching activities	ENVISAGED AA-H	AA-E General Teaching	AA-E Type of teaching activities	Overall Strength of Adoption Activities CURRENT & ENVISAGED
Art	4	4.00	3.75	2.00	4.00	4.00	4.00	AA-C- /AA-E++
SS	7	4.00	3.00	3.00	4.00	4.00	4.00	AA-C/AA-E++
NS	2	3.00	3.25	3.00	3.00	3.25	3.00	AA-C/AA-E
2nd Language	7	4.00	3.25	3.50	4.00	3.00	3.00	AA-C+/AA-E
English	9	3.00	4.00	4.00	4.00	3.50	3.50	AA-C++/AA-E+
Maths	10	4.00	4.00	4.00	4.00	4.00	4.00	AA-C++/AA-E++
EMS	5	4.50	4.00	4.00	4.00	4.00	4.00	AA-C++/AA-E++

Table 49: Comparison of teachers' Current and Envisaged Horizontal and Teaching Adoption Activities – Median Values

As seen in the table 49 the majority of teachers, from all subjects, expect to make more frequent and extensive use of tablets in the future. Art teachers report the greatest shift towards more frequent and extensive use of tablets for teaching in the future, whereas English and SS teachers envisage that in the future, their use of tablets in the classroom will decrease slightly. EMS, Maths and NS teachers expect their future frequency and extent of tablet use, to remain almost the same. Internet access and classroom productivity enhancements are expected by all teachers to remain the mostly frequently used type of activity, however a shift towards more frequent use of tablets in relation to explaining new concepts and creating relevance, drill and practice and facilitation of more collaborative learning was reported across all subjects. Teachers' age appears to influence envisaged future use of tablets, for the creation and showing of presentations to learners.

4.2.4 Summary of Orientation towards Tablet Technology (OTT)

Using the summary scores of Levels of Adoption (LA), Manner of Adoption (MA) and Adoption Activities (AA), I am now in a position to construct an overall view of subject teachers' OTT. Each construct was scored using the relative strength or weakness reported in the detailed analysis. The OTT rating was calculated as follows: for each construct that had been scored with two minuses (- -) the description of very weak was assigned; for one minus (-) the description of weak was assigned; with neither plus or minus the description of average was assigned; with one plus (+) the description of strong was assigned; and with two plusses (++) a description of very strong was assigned. Once scored, the difference between the plusses and minuses were calculated to arrive at an overall OTT per subject. Table 50 shows the scores of teachers' accounts of their Current OTT and table 51 shows the scores for teachers' accounts of their Envisaged OTT.

Subject	Number in Group (n)	Tablet Technology Adopted in Supportive Capacity (MA-P)	Tablet Technology Adopted in Innovative (MA-I)	Levels of Adoption (LA)	Adoption Activities (AA) Horizontal and Teaching	Teacher's Orientation towards Tablet Technology (OTT) CURRENT
Art	4	Weak	Average	Average	Weak	OTT- -
NS	2	Weak	Average	Average	Average	OTT-
2nd Language	7	Average	Average	Average	Strong	OTT+
SS	7	Strong	Strong	Strong	Average	OTT +++
English	9	Average	Strong	Average	Very Strong	OTT+++
Maths	10	Average	Strong	Strong	Very Strong	OTT++++
EMS	5	Strong	Strong	Strong	Very Strong	OTT+++++

Table 50: Teachers' Current Orientation towards Tablet Technology (OTT) – Median Values

Subject	Number in Group (n)	Tablet Technology Adopted in Supportive Capacity (MA-P)	Tablet Technology Adopted in Innovative (MA-I)	Levels of Adoption (LA)	Adoption Activities (AA)	Teacher's Orientation towards Tablet Technology (OTT) ENVISAGED
NS	2	Average	Average	Average	Average	OTT
2nd Language	7	Average	Average	Average	Average	OTT
Art	4	Average	Average	Average	Very Strong	OTT++
English	9	Strong	Strong	Strong	Strong	OTT++++
SS	7	Strong	Strong	Strong	Very Strong	OTT+++++
Maths	10	Strong	Strong	Strong	Very Strong	OTT+++++
EMS	5	Strong	Strong	Strong	Very Strong	OTT+++++

Table 51: Teachers' Envisaged Orientation towards Tablet Technology (OTT) – Median Values

At the present time, EMS, Maths, SS and English teachers report they have the strongest OTT, whereas Art teachers report they have the weakest, and NS and 2nd Language teachers report a mixed OTT. In the future, all teachers envisage a shift towards stronger OTT, with Art teachers expecting the most dramatic increase. .

To draw a comparison between teachers' accounts of Current and Envisaged OTT, a median score was calculated as follows: where one or two minuses were assigned (- -) a score of 1 was assigned; no minus or plus which implies a neutral or undecided position was scored at 2; one plus was scored at 3; two the three plusses were scored at 4; and five or more plusses at 5. These median scores were used to compare subject teachers' accounts of their Current and Envisaged OTT, as shown in figure 24.

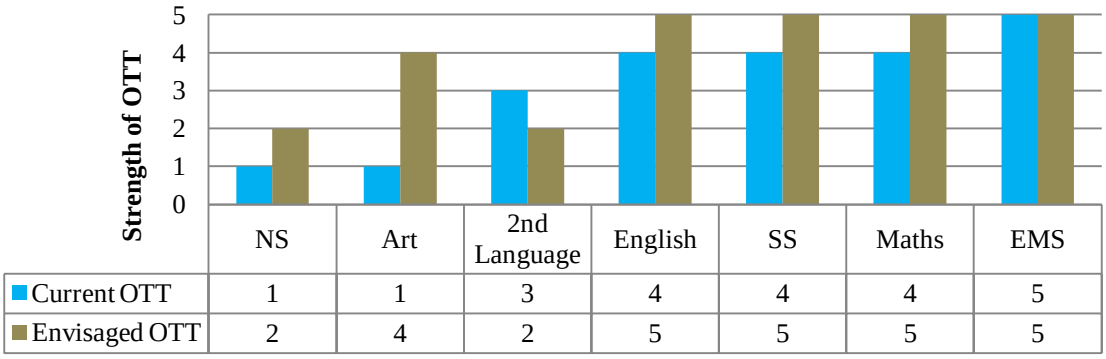


Figure 24: Comparison of teachers' accounts of Current and Envisaged Orientation towards Tablet Technology

4.3 Relationship between Professional Disposition (PD) and Orientation towards Tablet Technology (OTT)

The conceptual framework developed for this study is framed by the overarching research question which asks ***whether teacher's different Professional Dispositions influence or shape their adoption of technology in the classroom***. Table 52 below summarises the findings of this study for the construct of Professional Disposition (PD), in relation to teachers' accounts of their Current and Envisaged Orientation towards Tablet Technology (OTT).

Subject	Number in Group (n)	Professional Disposition by subject	OTT CURRENT	OTT ENVISAGED
Art	4	(PD-I)Horizontal/(PD-R)Performance & Competence	OTT- -	OTT++
NS	2	(PD-I)Vertical & Horizontal/(PD-R)Competence	OTT-	OTT
2nd Language	7	(PD-I)Vertical & Horizontal/(PD-R)Competence	OTT+	OTT
English	9	(PD-I)Horizontal/(PD-R)Competence	OTT+++	OTT++++
SS	7	(PD-I)Horizontal/(PD-R)Performance & Competence	OTT+++	OTT+++++
Maths	10	(PD-I)Vertical/(PD-R)Performance	OT++++	OTT+++++
EMS	5	(PD-I)Vertical/(PD-R)Performance	OT+++++	OTT+++++

Table 52: Subject Teacher's Professional Dispositions (PD) in relation to their Current and Envisaged Orientation towards Tablet Technology (OTT)

Based on the survey analysis presented, except for SS teachers, those teachers who view their subject as either *horizontal or vertical* and/or exhibit a preference for either *performance or competence mode* pedagogy appear to *strong adopters* of technology in the classroom, whereas teachers which view their subject's discourse or their preferred pedagogic mode as *mixed*, appear *less inclined to adopt technology* in the classroom. Except for 2nd Language teachers', future envisaged OTT is stronger, across all subjects. Therefore it seems that a relationship exists between teachers Professional Dispositions (PD-I and PD-R) and their Orientations towards Technology (OTT).

This chapter has described the findings of the survey, and highlighted trends and inconsistencies within the data, in the next chapter I will be discussing these findings in more depth.

CHAPTER 5: SURVEY DISCUSSION

The intention of the survey was to provide a broad level of understanding of the issues involved in the adoption of mobile technology by teachers. In this discussion, Hoadley's and Ensor's (2009) conception of Professional Disposition (PD) and Hooper's and Rieber's model of educational technology adoption (1995) are used to explore the survey findings in more depth. This chapter discusses the analysis presented in the previous chapter in order to address the main question of the study, which is *whether a relationship exists between teachers' Professional Dispositions and their level and form of adoption or non adoption of tablet technology in the classroom*. In order to investigate this relationship in more depth, firstly the sub-question relating to PD, which asks, *what are different teacher's Professional Dispositions?* will be discussed, next the sub-question relating to OTT, which asks *what are different teachers' Orientation towards Tablet Technology relative to their current and envisaged use of tablets?* will be discussed. Finally, the sub-question which asks *whether a relationship exists between teachers' Professional Disposition and their Orientation towards Tablet Technology* will be discussed. The last sub-question which asks if there *are principled reasons why teachers choose to adopt or not adopt technology in the classroom*, requires a more nuanced understanding that is not provided for in the survey findings, and thus will be addressed in the interview analysis and discussion in chapter 6.

The survey discussion mainly uses the subject taught to explore the findings of the survey analysis, but where teachers' ages or years of teaching experience provide insights, findings on these demographic groupings will also be mentioned.

5.1 Professional Disposition (PD)

In the study, Professional Disposition (PD) has been defined as "how teachers think and speak about their subject knowledge, learners, pedagogic practice and the relationship between themselves and their learners" (Hoadley & Ensor, 2009, pg2). In order to uncover different teachers' PDs, the survey asked questions in relation to how teachers perceive the subject they teach and their subject specific skills (instructional discourse), and how they construe the way they teach and the relationship between them and their students (regulative discourse).

5.1.1 Instructional Discourse (PD-I)

The instructional discourse looks at the 'what' of the pedagogic discourse relative to "strength of the boundaries or degree of insulation between discourses" (Bernstein, 2000, pg6), shaped by teachers' positions in relation to their subject knowledge being more strongly (vertical knowledge structure) or weakly (horizontal knowledge structure) classified.

From the survey analysis it appears that the s*ubject taught shapes the instructional discourse of teachers' PDs*. Educators teaching subjects that possess strong vertical knowledge structures, such as Maths, seem to view their instructional discourse as being strongly classified, whereas teachers that teach subjects that have large amounts of horizontally structured knowledge, such as English, Art[63] and SS, appear to view their instructional discourse as weakly classified. Interestingly within the learning area called EMS, teachers also appear to view their instructional discourse as strongly classified; however diverse views are present amongst EMS teachers which may be due to the subject, Accounting, which requires students to access both vertical and horizontal knowledge structures, whereas Business Studies requires students to access mainly horizontal knowledge

Mixed views as to the classification strength of teachers' instructional discourse appear evident amongst 2nd Language and NS teachers; however, the survey findings remain unclear with regards to the underlying reasons. It is possible that for 2nd language teachers, the apparent mixed views as to the classification strength of their instructional discourse may be due to the survey design, in which the 2nd language grouping was conflated by including Afrikaans and Zulu, which are commonly spoken daily in South Africa, together with other additional languages. For NS teachers, perhaps the combination of Science and Biology into one umbrella subject, accounts for this mixed view.

When analysing the data according to years of experience, rather than subject, it appears that teachers with more *experience believe boundaries between school knowledge and everyday knowledge should be separated*, however, they seem to believe learning tasks should be related to the everyday lives of their students. Teachers with less experience seem to think that boundaries between the everyday and school are blurred. Consistent with Albirini's (2006) findings in relation to teachers' attitudes towards technology, teachers' *age seems to be an insignificant factor*.

In relation to *specialisation of attitudes*, it appears that teachers are unanimous in their belief that *specialisation is critical* and is an essential part of their instructional discourse, which may relate to how teachers in general feel about the practice of pedagogy. This finding is consistent with research done by Mishra and Koehler (2006), in which they state that "teaching is a highly complex activity that draws on many kinds of knowledge" (pg 1025) and therefore requires specialised attitudes. It is hardly surprising that teachers believe this, otherwise they would be disowning the necessity of their role as a teacher.

[63] It is important to mention that large variations apparent amongst Art teachers may be due to the survey analysis grouping all Art forms such as Drama, Visual Art and Music into a single subject category. Whilst this may not necessarily have been the most optimal grouping, due to the number of responses received from Art teachers, it was not feasible to analyze them separately.

5.1.2 Regulative Discourse (PD-R)

The regulative discourse looks at the 'how' of the pedagogic discourse, measured by framing, relative to the "way in which knowledge is selected, sequenced, paced and evaluated" (Hoadley & Ensor, 2009, pg2). Teachers' pedagogic practices exist on a continuum with a performance based modality possessing strong framing, or competence based modality possessing weak framing rules (Bernstein, 1996). According to Hugo (2013), teachers that view their subject knowledge as vertical tend to primarily choose more performance *based pedagogic modes, whereas teachers that believe that their subject knowledge is more horizontally based seem to prefer more competence based pedagogy.*

From the survey analysis it appears that the *subject taught also plays a role in shaping the regulative part of teachers' PDs.* Educators that teach subjects that possess strong vertical knowledge structures, such as Maths seem to construe their regulative discourse as being strongly framed, whereas teachers that teach subjects that have large amounts of horizontal knowledge such as English appear to view their regulative discourse as weakly framed. Similarly to their instructional discourse views (PD-I), the majority of EMS teachers also appear to view their regulative discourse as strongly framed, however, in relation to the use of facilitation in the classroom largely diverse views appear to be present amongst EMS teachers. This may be due to teachers perceiving that *different parts* of EMS *require different pedagogic approaches*. This finding supports Howard's and Maton's (2011) research, in which they established that subjects characterised predominantly by horizontal knowledge structures may contain certain parts that require vertical knowledge type skills. Similarly, subjects characterised by predominantly vertical knowledge structures have parts that require horizontal knowledge type skills.

2nd Language and NS teachers appear to hold mixed views as to the classification strength of their instructional discourse, with regard to their regulative discourse, however, they appear to construe the framing rules as weak. From the survey analysis it is unclear whether 2nd language teachers more weakly framed construal of their regulative discourse is due to the conflation of the subject grouping, whereas for NS teachers this may be due to combining two different subjects into one umbrella subject.

Art and SS teachers, who construe their instructional discourse as weakly classified, appear to have a more mixed view of their regulative discourse. Again, from the survey analysis, it is unclear whether the combination of all Art teachers into one subject grouping, and for SS the combination of two different learning areas into one subject, accounts for this shift.

When analysing the data according to years of experience rather than subject, it appears that teachers with more experience and those with less experience, hold strong views in relation to the use of *group*

work and independent research within their pedagogic practice. A possible reason for this may be that those teachers with more experience possess deeply entrenched opinions and pedagogic practices, whereas the pedagogic beliefs and practices of those with less experience are still closely tied with their recent teacher training (Afshari, Abu Baker, Su Luan, Abu Samah & Say Fooi, 2009). In relation to *evaluative criteria*, both teachers' age and years of teaching experience appear to be significant. The data analysis findings show that younger teachers with less experience perceive that they make use of clear cut criteria in most of their assessment tasks, whereas older teachers with more experience appear to think their assessment tasks are not characterised by clear cut criteria. Similar to views on the use of group work and independent research, a possible reason may be older teachers with more experience possess deeply entrenched subject type knowledge, whereas subject knowledge of younger teachers with less experience appears to be more surface type knowledge. In addition, younger teachers have recently been exposed to training on assessment standards and guidelines where explicit use of assessment criteria is being motivated (Gipps, 1999), this may account for this view.

5.1.3 Conclusion for Professional Disposition

Using the relative strengths and weakness of classification and framing, as mentioned in the literature review, *collection codes* exhibit relatively strong framing and classification, whereas *integrated codes* are characterised by relatively weak classification and framing, with blurred boundaries between everyday and school knowledge being evident (Bernstein, 2000; Morais, 2002).

From the survey analysis it appears that Maths and EMS teachers were found to possess a collection pedagogic code as they view their PD-I as mainly vertical knowledge with strong classification, and their PD-R as mainly performance based with strong framing. At the other end of the continuum, English teachers were found to possess the integrated code, as they construe their PD-I as mainly horizontal knowledge with weak classification and their PD-R as mainly competence based with weak framing.

Art, SS, 2nd Language and NS teachers appear to possess a mixture of collection and integrated pedagogic codes. Art and SS teachers' construal of their instructional discourse (PD-I) is mainly a horizontal knowledge structure with weak classification, however, they perceive their regulative discourse (PD-R) as a mixture between performance and competence with a mixture of framing.

Conversely 2nd language and NS teachers construe their PD-I as a mixture of horizontal and vertical knowledge structures with mixed classification strength, and their PD-R as mainly competence based with weak framing. [64]

From the survey analysis it can be concluded that the nature of *teachers' dispositions seem to be shaped and influenced by the subject that they teach (PD-I) and the way that they teach (PD-R).* Years of *teaching experience* also appears to be a significant factor in shaping teachers' PDs, with *less experienced teachers more likely to adopt technology* in the classroom (National Center for Education Statistics, 2000)

5.2 Orientation towards Tablet Technology (OTT)

Teachers' PDs, characterized by their orientations to pedagogic practice, are essential in understanding adoption behaviours. However, as I am interested in studying teachers' adoption behaviours in relation to tablet use in the classroom, conceptual constructs drawn from Hooper's and Rieber's (1995)[65] model of educational technology adoption were included in the survey with the intention of gaining a sense of different teachers' OTTs, as well as their current and envisaged accounts of tablet use in the classroom. Questions relating to Levels of Adoption (LA), Manner of Adoption (MA), as well as types and frequency of Adoption Activities (AA) were constructed by combining Hooper's and Rieber's (1995) Levels of Adoption with Bernstein's different types of knowledge structures (2000). As in the survey analysis, each of these constructs will be discussed from a current and envisaged perspective.

5.2.1 Levels of Adoption (LA)

The five Levels of Adoption (LA) will be discussed in the categories of (1) Familiarization; (2) Utilization and Integration; and (3) Reorientation and Evolution.

5.2.1.1 Familiarization (LA-F)

Familiarization deals with teachers' initial exposure to, and experience with the technology, and concerns issues of how to use technology in everyday life. The survey analysis found that at the present time all teachers, except for English and NS teachers, appear to think, they are comfortable using tablets in their everyday lives. All teachers envisage that in the future they will be confident in

[64] As mentioned previously, possible reasons that may account for the mixed pedagogic codes amongst these subject teachers are the design of the survey, which conflated the 2nd language subject grouping; the method of survey analysis, which categorised all art forms into one subject grouping; or the combination of two different subjects into one umbrella subject discipline.

[65] As discussed in the literature review, although Hooper's and Rieber's (1995) Levels of Adoption (LA) advocate the ultimate reorientation of formal education due to the use of technology, this study does not advocate such an approach, and has simply made use of these levels to describe current and envisaged adoption behaviours of teachers.

using tablet technology in this aspect of their lives. However, it is unclear why English and NS teachers appear to hold different views from the rest of the teachers. The shift towards more positive views amongst teachers about future use is consistent with findings that teachers need time to be able to become comfortable and confident with using tablets, as it is a personal tool (Sackstein & Spark, 2012).

5.2.1.2 Utilization and Integration (LA-U and LA-I)

The construct of Utilization and Integration deals with teachers' trials of technology in the classroom, as well as their intentional choice to use technology to support their current teaching. The survey analysis found that at the present time, English, SS, Maths and EMS teachers' level of Utilization and Integration of tablet technology appears to be quite extensive and these teachers do not envisage that this will change significantly in the future. Although NS, 2nd Language and Art teachers currently do not seem to make widespread use of tablet technology in their teaching, they envisage that in the future, a shift towards greater use of tablets for teaching will occur[66] .

5.2.1.3 Reorientation and Evolution (LA-R and LA-E)

Reorientation and Evolution of teaching occurs when teachers reconceptualise and re-evaluate their teaching practices and begin to examine new technologies as a one of the possible resources to enable relevant teaching and learning. The survey analysis found that NS, Art and 2nd Language teachers appear to be undecided, both at the present time and in the future, as to the ability of tablets to reorientate and innovate their own personal teaching, as well as general pedagogic practices. Contrary to this EMS, Maths, English and SS teachers seem to believe that tablets currently do assist and envisage that in the future they will continue to reshape their personal pedagogic practice, as well as general teaching practices within formal education (note 66).

5.2.1.4 Conclusion for Levels of Adoption (LA)

Findings at each of the Levels of Adoption seem to indicate that in general, teachers with *weakly classified* and *framed* PDs, as well as those with *very strongly classified* and *framed* PDs, *appear to be the most enthusiastic and extensive adopters of technology*, whereas teachers with *mixed* PDs appear to be *less likely and unsure about the adoption* of tablet technology in their teaching. Contradictory findings were evident with regards to SS teachers, who possess *mixed* PDs and still seem to be *enthusiastic* about tablet adoption in their teaching, and Art teachers who possess *weak classified* and *framed* Professional Dispositions *do not appear to be adopters* of tablet technology in the classroom. Although it is not clear from the survey findings as to the reasons why these contradictions are present, perhaps the grouping of History and Geography, under one learning area, and the grouping of

[66]Similar to the previous levels, future expectations of teachers are more positive (Sackstein & Spark, 2012).

all forms of Art under one subject grouping in the survey analysis, may offer an explanation. Consistent with the literature on tablet technology adoption, in which it was established that teachers need time to be able to become comfortable and confident with using the tablet as a personal and teaching tool (Sackstein & Spark, 2012; National Center for Education Statistics, 2000), the survey found that all teachers envisage that in the future they will shift towards more extensive use of tablets.

5.2.2 Manner of Adoption (MA)

Hooper and Rieber (1995) [67] define two different ways in which technology in the classroom can be used: a Product technology supports established and traditional pedagogic practices, whereas an Idea technology reorientates or innovates current pedagogic practices through a type of technology.

5.2.2.1 Tablet Technology as a Supportive Tool (MA-P)

The survey analysis found that at the present time, NS and Art teachers, report that tablets do not offer support in the classroom, whereas EMS and SS teachers think that they do offer support. Mixed views were found amongst Maths, English and 2nd Language teachers. Most teachers envisage that in the future they will make more use of tablets to support their current pedagogic practices, however, NS and Art teachers continue to have mixed or neutral views in this regard. 2nd Language teachers think similarly about current and future use of tablets, as supportive tools. Findings related teachers' accounts of their current use of tablets suggests that teachers' *PDs do not influence whether they view tablets in the classroom as a support*, whereas teachers' *envisaged views* seem to suggest otherwise.

5.2.2.2 Tablet Technology as an Innovative Tool (MA-I)

Consistent with the survey findings related to teachers' envisaged future use of tablets as a supportive tool, it appears that in general, teachers who hold *mixed PD's*, either in relation to their view of knowledge as horizontal and vertical or their pedagogic mode as performance and competence, *do not see tablets in the classroom at the present time nor do they envisage that in the future they will use tablets as innovative tools.* Teachers who hold *horizontal* and *competence* PD's or *vertical* and *performance*, seem to be the *most extensive and enthusiastic adopters* of tablets as innovative teaching tools. In *contradiction* to this finding, *SS* teachers currently appear to be *strong adopters* of technology, as well as envisage that in the future they will continue to adopt tablet technology. A possible reason for this contradiction may be that SS is an umbrella subject for two vastly different disciplines. Unlike previous findings, teachers do not envisage that in the future they will shift towards more positive views of tablets as innovative teaching tools.

[67] As discussed in the literature review, Hooper and Rieber (1995) view of the use of educational technology in a supportive capacity as limited and the use of tablets as an innovative tool as the ultimate goal. Rather, the intention of this study is simply to describe different manners of tablet adoption and not to make judgements of either as 'good or bad' (Jaffer, 2010).

5.2.2.3 Conclusion for Manner of Adoption (MA)

Findings in terms of MA, both as a supportive and innovative tool, in general seem to indicate that teachers with *strongly classified* and *framed PDs*, as well as teachers with *weakly classified* and *framed PDs*, either are *adopting or envisage that in the future they will adopt tablet technology in significant ways in the classroom*. However, teachers with more *mixed PDs tend to be less enthusiastic and extensive in their tablet technology adoption in the classroom.* An anomaly to this finding is that SS teachers who possess a mixed PD tend to be both enthusiastic and extensive in their adoption of tablets.

5.2.3 Adoption Activities (AA-H, AA-C and AA-E)

Although LA and MA are important indicators of educational technology adoption, the types and frequency of adoption activities that teachers utilize and envisage using tablet technology for in their teaching, may provide a more insightful and deeper view of teachers' OTT. By extending Bernstein's (2000) conception of horizontal and vertical knowledge structures, horizontal activities (AA-H), where teachers use tablets in their everyday lives; current pedagogic activities (AA-C), in which teachers are currently making use of tablets for their teaching; and envisaged pedagogic activities (AA-E), in which teachers envisage that in the future they will make use of tablets for this purpose, are discussed below.

5.2.3.1. Horizontal Adoption Activities (AA-H)

The survey found that in general teachers do not believe they have had to expend considerable effort to become comfortable with using tablets in their everyday lives. A possible reason for this may be the prolific and growing use of smartphones (Myers & Michael, 2003) in all areas of people's lives, which may have facilitated the almost effortless shift towards tablet use. English teachers report that they are currently less comfortable than other teachers in using tablets in their everyday lives, however, it is unclear from the survey analysis whether this is related in any way to their PDs, which were found to be weakly classified and framed with blurred boundaries between everyday life and school. A possible reason for this lack of comfort may also be due to the *lack of time* currently available to become familiar with the tablet[68] (National Center for Education Statistics, 2000), or simply a function of the *teacher personalities* surveyed. This finding is consistent with claims made by Zisow (2000) that "whether or not technology is used is a question of teaching style" (pg38). *Teaching style,* which is shaped by an *individual's personal characteristics*, was found by Afshari et al. (2009) to be an important factor in teachers deciding on whether to adopt or not to adopt technology in their teaching. With regards to future confidence in using the tablet, the survey found that most of the teachers do not envisage that in the future the additional time to become comfortable with the tablet, will change their

[68]English teachers envisage that in the future, with more effort, they will become more comfortable in using tablets in their everyday lives

current views; with Art and EMS teachers envisaging that in the future they will need to expend more effort. This is in contradiction to research conducted by Afshari, et al. (2009), in which the lack of time and opportunities to practice with the technology was found to hinder teachers' use of technology. As with current perceptions, it is unclear from the survey analysis if this is related to the teachers' PDs or if it is merely a function of their personal teaching styles (Afshari, et al., 2009; Zisow, 2000).

Age and teaching experience were found to be significant in relation to future confidence with tablets in everyday life, with *less experienced and younger teachers envisaging that in the future, tablet use* within their *everyday lives will require almost no effort*, whereas older and more experienced teachers are unsure. A possible reason for this may be that younger teachers with less teaching experience have had more exposure to technology in their everyday lives and thus according to the digital native and digital immigrant debate, will be more comfortable (Prensky, 2001).

5.2.3.2 Teaching Adoption Activities (AA)

In the survey analysis Art, 2nd Language and NS teachers report that they are currently not making significant use of tablets in their teaching, while all other teachers appear to be making use of tablets. As with previous findings on MA and LA, it appears as if teachers who either have very strongly classified and framed PDs (EMS, Maths) or very weakly classified PDs (English) are strong adopters of tablets in the classroom (AA-C++), alluding to a relationship between PD and teaching adoption activities. Whilst it seems that SS teachers, who possess a mixed PD are also strongly adopting tablets in their teaching, it is unclear from the survey as to the reasons behind these choices.

Except for NS teachers, all other teachers envisage that in the future, using tablets for teaching will beneficial, however, largely diverse opinions were found within each of the subject grouping in relation to the amount of effort that will be required. As the survey analysis does not provide insights into the reasons why these variations of opinions are present, it is difficult to draw any clear interpretations from these findings. A possibility may be that the categorisation of teachers based on subject taught may not be sufficient on its own. As with the current use of tablets, age and teaching experience appear to be significant factors for envisaged use.

5.2.3.2.1 Current Types and Frequency of Teaching Adoption Activities (AA-C)

In the survey analysis it was found the *most frequent category*, for which teachers report they are using tablets for the classroom, is *internet access*[69]. The next most frequently used categories reported

[69] Encompasses looking up information and accessing online videos

are *classroom productivity enhancement*[70] and *explaining new concepts and creating relevance* for learners. The *least frequent* category used by teachers, is related to *facilitation of collaborative learning*[71]. A concern with the interpretation of this finding, is that advocates of educational technology, premised on Cuban's (1986) and Hooper's and Rieber's (1995) work, may possibly conclude that educational use of tablets have failed, as they have not resulted in a substantial shift within traditional teaching practices towards more collaborative and constructivist pedagogic practices.

Teachers' accounts of their use of tablets for *teaching and productivity related activities*, by both teachers with strongly classified and framed PDs (EMS and Maths) and teachers with weakly classified and framed PDs (English), were found to be frequent and extensive. However NS, 2nd Language and Art teachers, which were found to possess mixed PDs[72], appear to be limited in the extent and frequency of their adoption of tablets in the classroom. This seems to indicate that a ***relationship exists between teachers' Professional Dispositions*** (PD) and their ***Orientation towards Tablet Technology*** (OTT).

Furthermore, in the survey analysis it was found that some types of teaching adoption activities are used more frequently and extensively by particular types of subject teachers. However, activities such as creating relevance for learners does not seem to be subject specific, but may rather be related to the aims of teaching. Subject specific activities, such as *drill and practice* and *simulations*, appear to be used *most extensively and frequently used* by teachers with predominantly *vertical based discourses*, such as Maths and EMS, whereas making videos and learner collaboration appears to be used most frequently and extensively used by teachers with more horizontal based discourses, such as English. Contrary to this finding is that EMS and Maths teachers also appear to be making use of tablets for videos and other more horizontal based activities. This is consistent with the literature in which Howard and Maton (2011) found that subjects are not either vertical or horizontal, but rather are made up of parts that require horizontal skills (such as creative writing) and vertical skills (such as English grammar)

In addition to subject differences, the survey analysis found that *more experienced teachers* seem to make *more frequent use* of tablets for *drill and practice* and *presentation creation*. This is in opposition to findings by the National Center for Education Statistics (2000), in which more experienced teachers made less use of technology in their teaching.

[70] Encompasses showing presentations to learners and email communication
[71] Encompasses learner wikis or online blogs and collaborative based teaching and learning activities
[72] It is possible that the design of the survey instrument; the method of data categorization for analysis; or the combining of separate subjects into one umbrella subject heading, may account for this result.

5.2.3.2.2 Envisaged Types and Frequency of Teaching Adoption Activities (AA-E)

In the survey analysis it seems as if Art teachers envisage that in the future, they will have the greatest shift towards more frequent and extensive use of tablets for teaching, whereas English and SS teachers appear to believe that their use of tablets in the classroom in the future will decrease slightly, and the remainder of the teachers seem to think that their current and envisaged future use of tablets will remain the same.

Most teachers, across all subjects, envisage that in the future they will make more frequent and extensive use of tablets, specifically in relation to explaining new concepts and creating relevance, drill and practice and facilitation of more collaborative learning. However, teachers still envisage that in the future the use of tablets in the classroom will be *most frequently and extensively* used for accessing the *internet* and *enhancing classroom productivity*. This finding does not imply that tablet technology which does not enable or encourage pedagogic constructivism (Jaffer, 2010) has failed (Cuban, 1986), but rather that *teachers make principled decisions about how best to use the technology to support their pedagogic aims*. In relation to the activity of creating and showing of presentations to learners, *teachers' age* appears to *influence teachers' future expectations*. This is contrary to findings in which teachers' age was not found to be significant (Albirini, 2006)

5.2.4 Summary of Orientation towards Tablet Technology (OTT)

From the survey analysis it appears that at the present time, in relation to Levels of Adoption (LA), Manner of Adoption (MA), Adoption Activities, both Horizontal (AA-H) and Teaching (AA-C), *EMS, Maths, SS and English* teachers were found to have the *strongest OTT*, *Art* teachers the *weakest*, and *NS and 2nd Language* teachers a *mixed OTT*. In the *future*, it appears that all teachers envisage they *will shift towards a stronger OTT*, with Art teachers envisaging the biggest shift.

5.3 Relationship between Professional Disposition (PD) and Orientation towards Tablet Technology (OTT)

From the findings presented in this chapter it is possible to provide a broad level understanding as to whether a ***relationship exists between teachers' Professional Dispositions (PD-I and PD-R) and their level and form of adoption or non adoption of tablet technology in the classroom***. In the PD construct it seems from the survey analysis that different subject teachers do in fact possess different PDs, either in relation to their PD-I and/or PD-R. Teachers that possess *strongly or weakly classified and framed PDs* appear to be *strong adopters* of technology, while teachers with a *mixed view* of their subject's discourse or their preferred pedagogic mode appear to be *less inclined* to adopt technology in the classroom.

In the construct of OTT, it seems that in general the strength of classification and framing of teachers' PDs influences teachers' Levels of Adoption (LA), Manner of Adoption (MA) and Teaching Adoption Activities (AA) both in the present (AA-C) and in the envisaged future (AA-E). Notwithstanding SS teachers who were found to possess mixed PDs and strong OTT, it is possible that the survey findings point towards the existence of *a relationship between teachers' Professional Disposition and their Orientation towards Tablet Technology.*

5.4 Summary of Survey Findings

The findings and analysis of the survey chapter provides a broad overview of tablet technology adoption behaviour amongst teachers. It suggests that teachers with either strongly or weakly classified and framed PDs tend to be more extensive and enthusiastic adopters of tablet technology in the classroom ,than those with mixed PDs. Table 53 provides a summary of the survey findings and depicts the relationship between PD and OTT.

Subject	Professional Disposition Instructional (PD-I)	Professional Disposition Regulative (PD-R)	Orientation towards Tablet Technology (OTT) CURRENT	Types of Adoption Activities used Often CURRENT	Orientation towards Tablet Technology (OTT) ENVISAGED	Types of Adoption Activities to be used Often ENVISAGED
EMS	**Vertical**	**Performance**	**Very Strong**	• *Internet Access* • *Practice of Skills* • *New Concepts & Relevance* • *Class Productivity* • ***Collaborative Learning***	**Very Strong**	• *Internet Access* • *Practice of Skills* • *New Concepts & Relevance* • *Class Productivity*
Maths	**Vertical**	**Performance**		• *Internet Access* • *New Concepts & Relevance* • *Class Productivity*		• *Internet Access* • ***Practice of Skills*** • *New Concepts & Relevance* • *Class Productivity*
English	**Horizontal**	**Competence**		• *Internet Access* • *New Concepts & Relevance* • *Class Productivity*		• *Internet Access* • *Class Productivity* • ***Collaborative Learning***
SS	**Horizontal**	**Performance & Competence**		• *Internet Access* • *New Concepts & Relevance* • *Class Productivity*		• *Internet Access* • *New Concepts & Relevance* • *Class Productivity*

2nd Language	**Horizontal & Vertical**	**Competence**	**Strong OTT**	• *Internet Access* • *New Concepts & Relevance* • *Class Productivity*	**Mixed OTT**	• *Internet Access* • *New Concepts & Relevance* • *Class Productivity*
NS	**Horizontal & Vertical**	**Competence**	**Weak OTT**	• *Internet Access* • ***New Concepts & Relevance***		• *Internet Access* • ***Class Productivity***
Art	**Horizontal**	**Performance & Competence**		• *Internet Access*	**Strong OTT**	• *Internet Access* • ***New Concepts & Relevance*** • ***Class Productivity***

Table 53: Summary of survey findings of Professional Dispositions (PD), Orientation towards Tablet Technology (OTT) and types and frequency of Current and Envisaged Adoption Activities[73]

Table 53 categorises teachers PDs and OTTs as very strong, mixed, or weak, along with the type of current and envisaged adoption. It is interesting to note that across all subjects, the *most widespread reported current use* of tablet technology is *internet access*. In addition to internet access, teachers that were found to possess a very *strong OTT*, report they are using tablets mainly for explaining *new concepts and creating relevance* and *enhancing classroom productivity.* At the present time, only EMS teachers report that they are using tablets for collaborative activities and practice of skills. With the exception of 2nd Language teachers, who envisage that they will shift from strong OTT to Mixed OTT in the future, all other teachers envisage they will *move towards increased adoption of tablet technology in their teaching.* Furthermore, the types of adoption activities that teachers envisage they *will use tablets* for in the future, are *mainly internet access and classroom productivity enhancement*, with collaborative learning being the least prevalent.

In order to obtain a deeper insight into whether teachers have *principled reasons when choosing to adopt or not to adopt tablet technology in the classroom,* an analysis and discussion of the qualitative interviews conducted, will now be presented

[73] Differences between teachers' accounts of current and envisaged adoption activities have been highlighted in bold typeface to show the shift from present to envisaged use.

CHAPTER 6: INTERVIEW ANALYSIS AND DISCUSSION

The survey analysis provides a broad categorization of the relationship between teachers Professional Dispositions and their Orientation towards Tablet Technology, as well as the types of Adoption Activities that teachers are currently using, or envisage that in the future they will use tablets for. However, human behaviour and understanding is complex, and therefore survey data are seldom able to be reduced to "simple, fixed and unambiguous definitions" (Creswell & Clark, 2006, pg47). In order to provide a more nuanced view of how individual teachers understand and construct meaning out of their experiences in relation to their decisions to adopt or not to adopt tablet technology in their teaching, interviews will be used to provide a more in-depth understanding of teachers' choices relative to the adoption of tablets in the classroom.

A total of 15 interviews were conducted at the 3 schools in which the survey data was collected. Teachers interviewed were selected from a list of volunteers, with the intention of providing the most widespread view of different subjects being taught. Table 54 below provides a summary of teachers interviewed, grouped according to the subject they teach, as well as the survey findings[74], their age, and years of teaching experience.

Subject[75]	**Experience**	**Age**	**Teacher's Name**
EMS (Accounting)	1-5 years	36-45	Leena
Maths	11-20 years	36-45	Linda
Maths	11-20 years	36-45	Steve
English	6-10 years	36-45	Brent
English	21-30 years	36-45	Glenda
English	21-30 years	55+	Dianne
SS (History)	1-5 years	21-25	Bianca
SS (History)	11-20 years	36-45	Paul
2nd Lang (Afrikaans)	11-20 years	36-45	Melindy
2nd Lang (Zulu)	11-20 years	46-55	Sandile
NS (Science)	31+ years	55+	Fabio
NS (Science)	31+ years	55+	Adrienne
NS (Biology)	31+ years	55+	Anne
NS (Biology)	31+ years	55+	Arlene
Art (Visual Art)	1-5 years	21-25	Tina

Table 54: Summary of teachers interviewed categorized by Subject[76]

[74] In table 53 teachers with strongly or weakly classified and framed PDs and those with mixed classification or mixed framing have been grouped together.

[75] This study did not match the interviewees with a specific survey response, as the survey was anonymous.

[76] In the survey, subjects that result from a combination of two different learning areas were not surveyed separately, however, while conducting the interviews it became evident that even though teachers teach NS or SS, a single subject view was expressed during the interviews. Their primary or preferred content knowledge has been inserted in brackets, to indicate in which learning area they were originally situated.

As with the survey, each part of the conceptual framework will be reported on separately, and will then be combined to discuss the interview findings.

6.1 Professional Disposition

As with the survey analysis and discussion, the conceptions of instructional and regulative discourses (Bernstein, 2000) and PD (Hoadley & Ensor, 2009) have been used in order to answer the research sub-question: ***what are different teachers' Professional Dispositions?***

6.1.1 Instructional Discourse (PD-I)

In order to gain a sense of teachers' instructional discourse, the following questions were posed during the interviews: (q1) *how do you view the importance of the subject that you teach*"(q2a) *what are the joys of teaching your subject?* (q2b) *what are the challenges of teaching your subject?* (q3a) *which sections do learners find challenging in your subject*? (q3b) *which sections to learners find exciting in your subject?* (q6) *in your opinion is your subject directly related to learners' knowledge of everyday concept?* and (q7) *in your opinion does your subject build on previous knowledge in a systematic manner?*

6.1.1.1 EMS and Maths (Vertical Knowledge)

As seen in table 53, the survey found that EMS and Maths teachers believe their subject is based on vertical knowledge that is strongly classified. In the interview sessions it was also found that these teachers believe that their subject is vertically based and requires systematic progression *"it's like learning to walk, I mean you can't run before you walk...you've got to get the baby steps right before you can advance"* (Steve-Maths), that *"they have to know the basics before they move on...you're not going to understand how the economy is affected by transactions if you don't know what a transaction is...that is accounting"* (Leena-EMS). However, within the interviews, distinctions between teachers; construal of their subject and everyday knowledge, was not as straightforward as it appeared in the survey. Steve reports that Maths *"is probably less related than most other subjects...but financial maths you can relate back....but definitely not everything relates to everyday knowledge"* (Steve-Maths), while Linda believes that Maths is related to everyday concepts because *"as times go by you are starting to see a lot more links to real life, it's not as abstract a subject...with the addition of finance, space and shape and data handling...it is making it a bit more relevant"*. Leena (EMS) also believes that Accounting is related to everyday life *"as they bring statements from home...which we will do an analysis on...then we can change it."*

6.1.1.2 English (Horizontal Knowledge)

English teachers, which were found in the survey to have weakly classified horizontal discourses, in terms of systematic progression think that *"although we would like to think that they must know all their nouns and verbs and adjectives before, they don't need to...for a lot of them it just comes naturally"* (Glenda-Eng), *"I don't think there is any order...you can read poetry and still enjoy it even if the students don't understand all the metaphoric language*" (Dianne-Eng). However Brent (Eng) believes that "*while some parts of English come very intuitively to kids, things like parts of speech you need to know those things before you can understand the meaning that comes from them"* because English "*builds on skills that they've been taught in earlier grades"(Glenda-Eng),* it is *"taught fairly systematically"* (Brent-Eng). In relation to everyday concepts being related to their subject, English teachers seem unanimous in their opinions that "*it is directly related...I think that the everyday is very important"* (Dianne-Eng), because it teaches them *"those soft skills...the way to interact with the world that really has an impact rather than learning about the structure of the novel"* (Brent-Eng).

6.1.1.3 SS and Art (Horizontal Knowledge)

SS and Art teachers were also found in the survey to have horizontal discourses with weak classification. Similarly, in the interviews Tina believes that Visual Art "*definitely comes up in their everyday life",* as *"there are everyday concepts that they need to understand....they have to know about current affairs and connect it back to what we're doing."* (Bianca-SS). However, this relationship to the everyday does not seem to preclude the need for systematic progression of knowledge as *"it does build up on one another...for example if we're doing a revolution as a concept, they have to know what a revolution is"* (Bianca-SS), *"you have to have some regard of what primary colours are...if you don't have that knowledge by the time you hit matric you are not going to be able to do visual literacy"* (Tina-Art).

6.1.1.4 NS and 2nd Language[77] (Mixed Knowledge)

NS and 2nd Language teachers were found in the survey to possess a mix of vertical and horizontal knowledge. This combination of different knowledge structures is evident in the interviews of NS teachers with regard to the relationship to everyday knowledge, as some teachers believe that "*definitely it is*" (Adrienne-NS), as *"everyday concepts are totally relevant...even in a section like electricity, if you approach it from how much money do you spend on electricity...it is something they are always doing"* (Arlene-NS), whereas other teachers believe it is *"not directly related"* and often *"you have to correct the bits of everyday knowledge that they bring into science which is usually a bit skewed"* (Adrienne-NS). All NS teachers interviewed, however, report that their subject requires systematic knowledge progression because "*it is about learning to solve problems in a certain way, a*

[77] While the interviews were conducted with a view to understanding the deeper issues, only Afrikaans and Zulu teachers were interviewed, and thus the interview may not provide a more detailed understanding of this finding.

structured way" (Fabio-NS) and *"if teaching is bad in the early years...you have to un-teach and teach them again...like what is an atom, a molecule...when they are exposed to it in lower levels they get unreal or distorted ideas"* (Adrienne-NS). A more unified view of the instructional discourse was found with 2nd language teachers, who believe that the relationship between the everyday and their subject exists, as *"no matter where they go they will find people, and the chance that they will come across an Afrikaans speaking person is 90% and then they will be able to understand"* (Melindy-Afrik), *"they come across people every day...they must communicate"* (Sandile-Zulu). In addition, 2nd language teachers were unanimous in their opinions as to systematic progression of knowledge within parts of their subject: *"there are parts of Zulu that are systematic...when it comes to grammar, you must come with the previous knowledge...you teach them step by step"* (Sandile-Zulu), *"whatever rules you have been taught in primary school, you will build onto them in high school...it automatically builds up to the next year"* (Melindy-Afrik). As only teachers which teach 2nd languages that are used in South Africa were interviewed, it is not possible to ascertain whether the design of the survey instrument contributed to mixed views of 2nd Language teachers.

6.1.1.5 Summary of Instructional Discourse (PD-I)

The interviews imply that while some subjects may encompass more horizontal than vertical knowledge structures, all subjects are constructed from different components and thus ***different parts of a subject may be horizontal, while other parts may be vertical.*** This is consistent with the study conducted by Howard and Maton (2011), in which it was found that while English is predominantly a horizontal discourse, there are parts of English, such as grammar, that require vertical knowledge structures. It is possible that the mixed instructional discourse found amongst NS and 2nd Language teachers in the survey may be attributed to subjects being made of different parts that require different types of knowledge. In addition, it suggests that the ***categorization of subjects as either vertical or horizontal may not be as clear cut*** as originally conceptualized.

6.1.2 Regulative Discourse (PD-R) [78]

In order to gain a sense of teachers' regulative discourse, the following questions were posed during the interviews: (q9) *describe your approach to teaching this subject?* (q10a) *describe your views in relation to the teacher controlling the sequencing of lesson content as opposed to the learner*; (q10ba) *how do you feel about learners controlling the pace at which they work?* (q11) *what are your views as to independent research or group work by learners as opposed to formal teacher instruction?* and (q12) *how do you feel learners should be assessed?*

[78] The components of PD-R used are *type of teacher instruction*; *collaborative activities*; *sequencing and pacing*; and *evaluative criteria*

From the survey findings in table 53 it seems that EMS and Maths teachers have a preference for Performance Pedagogic mode, whereas English, 2nd language and NS teachers prefer Competence based pedagogy, and Art and SS teachers are undecided. It is unclear from the survey analysis whether Art and SS teachers do in fact possess a mixed regulative discourse or whether the design of the survey instrument and the combination of History and Geography into the learning area of SS, may account for this. With the intention of providing a deeper understanding, interview findings related to these constructs are presented below.

6.1.2.1. EMS

Leena, the EMS teacher interviewed, holds similar views to the survey findings and prefers ***teacher based instruction:*** *"I think formal teacher instruction is first very important"* ,but still believes that *"a little bit of independent work"* can be helpful. Leena tends to *"give a slide of the bigger picture...with goals and targets for them and then I do with them at the end a checklist"* and strongly frames the ***sequencing*** *"giving them a plan on the steps that we're going to follow gives them security and it makes them feel...safe"*. Leena also believes that with ***pacing*** *"you can't allow your class to set the pace"* but thinks alternative types of ***assessments*** should be given: *"I don't think testing should be the only way"* (Leena-EMS).

6.1.2.2 Maths

Maths teachers interviewed do not hold such one-sided views as found in the survey, in which only teacher-based instruction is preferred, while Maths *"is more of an individual subject"* (Linda-Maths), *"with problem solving it would be useful to collaborate....it's especially useful where different people have different talents...so to put all those talents together to solve a problem is much more beneficial"* (Linda-Maths). Notwithstanding this view, the ***role of the teacher*** is still seen as important *"I would like to think that I have an important role in teaching, I don't want the kids to just go and do things and then come and ask me questions, so I try and lead the class in that they're asking questions to get the point that I am trying to make, instead of giving them the answer directly"* (Steve-Maths). As in the survey, both Steve and Linda believe that teacher control is important for ***sequencing***: *"I think that the teacher should try and control the sequencing...not the learners"* (Steve-Maths), *"with maths it does have to be the teacher that's controlling the sequencing because you can't go onto the next step without the feedback"* (Linda-Maths). With ***pacing***, Linda thinks teacher control is essential *"it is very important in maths...we have to finish the syllabus"* and while Steve agrees that *"it is the teacher's responsibility to make sure learners don't fall behind"*, he tries to "*keep a very laid back, casual approach...they are in little groups...they are allowed to discuss their work...it is not sit down quietly and try get on with it on your own*." In relation to ***assessment***, Steve believes that *"the only way to assess is can they do it...you're not going to assess a maths class on the history of Pythagoras, it doesn't prove that they know what his principles entail"*. Linda thinks that *"their understanding*

rather than their actual skill" should be assessed *"in a more realistic situation, even with collaboration...everyone has different talents...is it wrong to collaborate with someone who has a talent in another aspect?"* (Linda-Maths)

6.1.2.3 English

English teachers interviewed prefer ***teacher facilitation***, *"I like to be more of a facilitator"* (Dianne-Eng) and ***collaborative learning*** and find it most valuable, *"I don't think a teacher-centred approach has much value beyond a couple of minutes"* (Brent-Eng), *"the only way to give them confidence is to allow them to discuss it with their peers"* (Dianne-Eng). Teachers substantiate their views by saying that *"kids learn more if they do it themselves"* (Glenda-Eng) and *"it provides more meaningful learning"* (Dianne-Eng). With regard to ***sequencing*** of lesson content, unlike the survey findings in which English teachers were found to possess weak framing, English teachers interviewed think that *"a hybrid approach"* (Brent-Eng) which *"starts off with an introduction...centres the whole class...then tells them what their task is...when their due date is"* (Glenda-Eng), is preferable. However, while the English teachers interviewed would like weaker teacher sequencing, *"if something exciting is happening in your class you should run with it, because it could lead to other exciting things"* (Dianne-Eng), but *"it is quite difficult"* (Dianne-Eng) because *"we are so mark driven"* (Glenda-Eng). Similarly in relation to learners controlling the ***pace*** at which the lesson moves in an ideal world English teachers *"love that idea"* (Brent-Eng), but *"it is quite difficult"* (Dianne-Eng) as *"the system we find ourselves in is very limiting...it doesn't allow for this"* (Brent-Eng). In terms of ***assessment***, all the English teachers interviewed feel that current assessment *"is all wrong"* (Dianne-Eng), *"it is about collecting rather than connecting the dots"* (Brent-Eng), *"all the work that we do in a term comes down to marks on a page...it just feels so reductionist"* (Glenda-Eng). Dianne suggests, the *"use of more formative type of assessments...they can see where they have gone wrong, then you give them another chance...I think that would be more positive"*, while Brent suggests that a *"more global and cross-curriculum assessment where the real world becomes apparent"* may offer a better evaluation of real learning.

6.1.2.4 NS[79]

Similar to the survey findings on the ***role of the teacher***, NS teachers interviewed do not favour group work as *"group work has presented a problem"* (Anne-NS), *"it always ends up with one person doing all the work...brighter kids and they end up doing everything and the others just tag along, or copy work from them"* (Fabio-NS), however, while independent research *"is great because they learn to use all the resources...they are directed but they do the work themselves...it makes them think*"

[79] While 4 NS teachers were interviewed, it was evident from the conversations that Anne and Arlene were traditionally Biology teachers, and Fabio and Adrienne came from a science background.

(Arlene-NS) *"it takes too long...unfortunately because our syllabus is so huge"* (Adrienne-NS). Although the survey found that NS teachers have mixed views on pacing and sequencing, all NS teachers interviewed believe that teacher controlled ***sequencing*** is critical, *"as there are certain things and a certain order that you have to go through things in our subject"* (Adrienne-NS), therefore, *"it must be directed by the teachers" (Fabio-NS) and "the teacher plays a big part in it"* (Anne-NS). The vast NS syllabus and time constraints, *"if you want to get it done in a period of time, you need to control it"* were given to substantiate this view. While some teachers think *"it would be great"* (Arlene-NS) for learners to control the ***pace*** of lessons, due to the size of the work they need to get through, lesson pace needs to be controlled by the teacher: *"I find that it can't work if learners control the pace just because our syllabus is so huge...you have to keep on pushing them"* (Adrienne-NS). Similar to the survey findings on ***assessment***, some of the teachers interviewed think that formal testing is appropriate *"I don't have a problem with the way they are assessed at the moment"* (Fabio-NS), as it is the *"only way in which you really find out if you got your message across"* (Arlene-NS), whereas other teachers like Adrienne (NS) think that *"all sorts of ways, many ways...formal tests, producing something, setting their own tests"* should be used, as learners *"need to be given an opportunity to show what they know"*.

6.1.2.5 2nd Language

As with the survey findings, with regard to ***group work and independent research*** Melindy *"loves it"* because it enables them *"to reason with me as to why it shouldn't be a verb because they have done their own research"*, and Sandile thinks, that *"group work is important as it teaches them how to work with other people...especially in Zulu you have to talk to other people...so you can see where you make flaws and correct yourself"*. However, Sandile strongly believes that ***teacher instruction*** is still important, as *"you still have to know the rules and I am the one who must impart that knowledge to them and show them how to arrive at a certain point."* Unlike the survey findings, Sandile thinks that teachers should ***sequence*** their lesson content: *"I have to be systematic and teach them step by step, so I play a big role in controlling the sequencing"*, whereas Melindy thinks that some teacher control is needed: *"you have a set plan...at the end you know where you want to be"*, but flexibility is required. While both 2nd Language teachers interviewed think that learners do set the ***pace*** of lessons to some extent, ultimate control is vested in the teacher, as *"if I see they are ahead I let them run with it...and will cater for those that I see are struggling, but I let the process go on"* (Melindy-2ndLang). As with the survey findings in which 2nd Language teachers were found to hold mixed views as to ***assessment*** criteria, both Sandile and Melindy think that *"formal assessment is very important"* because *"for a learner to be at a certain level they must have reached or understood"* (Sandile-2ndLang), however, exceptions and some class assessments should also be taken into account *"because a child that is academically strong might not be the same child that can perform and be lively in front of the class"* (Melindy-2ndLang).

6.1.2.6 SS

When asked about the ***role of the teacher***, both SS teachers interviewed responded that they believe that ***collaboration*** and independent research is important: *"I believe in that...it teaches them to read, it teaches them to research, it teaches them independent thinking"* (Paul-SS), *"it is something I am incredibly passionate about"* (Bianca-SS), *"guidance by the teachers is obviously important"* (Paul-SS) and *"while formal instruction...is not my most comfortable, it is sometimes it is essential"* (Bianca-SS). Similar to the survey findings in which SS teachers were found to possess structured ***sequencing***, both Paul and Bianca think that "*children still need guidance, the teacher is the charge, they are our charges and we are their mentors"* (Paul-SS), and that lessons start with *"a very clear idea at the beginning of the lessons as to how it's going to go"* (Bianca-SS). With regard to ***pacing***, Paul believes that *"I control the pace"* however Bianca thinks "*you need to allow them to control it in some sense, I can't always be the one to say we're moving on."* In addition, different views on ***assessment*** were also present, with Paul believing that "*formal testing is the real testing...at the end of the day they have to write Matric am so we are preparing for that eventual stage...so for me formal testing is the ultimate"*, and Bianca thinking that *"sometimes assessments are out of line, there is a place for formal assessment...but it should be engaging them, pushing them to think and to be critical"*.

6.1.2.7 Art

In relation to the ***teacher's role***, Tina believes that group work is not so important, *"as Art needs to be very, very independent"*. She encourages learners to do independent research and also feels that *"standing in front of the class teaching is obviously necessary."* Similar to the survey findings, Tina thinks ***sequencing*** requires a mix, with less teacher controlled sequencing for practical work, whereas in theory based work that it is *"an unnecessary evil...because you won't understand some things unless you have covered other things...with the theory if you don't understand Neoclassicism, you will not understand Romanticism at all"*. Unlike with the survey findings, in which Art teachers were found to possess weakly framed ***pacing***, Tina prefers tight teacher pacing: *"I am quite strict on that, with all the freedom they get, they have to stick to deadlines...I don't think Art is a place for them to pick their own pace"*. In terms of ***assessment***, whilst Tina believes that *"art is sort of unquantifiable, I mean how do you put a number on someone's effort?"*, she is *"not really quite sure how else we could assess...perhaps let kids try and explain their product or group panel marking...could be more beneficial, but it's not feasible"*.

6.1.2.8 Summary of Regulative Discourse (PD-R)

Performance Pedagogic Mode	Subject	Teacher's Name	Teacher's Role	Collaborative Activities	Sequencing	Pacing	Assessment
	EMS	**Leena**	Instruction	Independent Research	Teacher	Teacher	Not only formal assessment
	Maths	**Linda**	Instruction	None	Teacher	Teacher	Not only formal assessment
	NS (Biology)	**Anne**	Instruction	Independent Research	Teacher	Teacher	Not only formal assessment
	NS (Science)	**Fabio**	Instruction	None	Teacher	Teacher	Formal assessment
	2nd Language (Zulu)	**Sandile**	Instruction	Group work	Teacher	Teacher	Not only formal assessment
	SS (History)	**Paul**	Instruction	Independent Research	Teacher	Teacher	Formal assessment

Table 55: Teachers interviewed with Performance Pedagogic Mode (PD-R with strong framing)

Competence pedagogic Mode	Subject	Teacher's Name	Teacher's Role	Collaborative Activities	Sequencing	Pacing	Assessment
	English	**Brent**	Facilitation	Group work and Independent Research	Teacher	Mixed	Not only formal assessment
	English	**Dianne**	Facilitation	Group work and Independent Research	Teacher	Mixed	Not only formal assessment
	English	**Glenda**	Facilitation	Group work and Independent Research	Teacher	Mixed	Not only formal assessment
	Maths	**Steve**	Facilitation	Independent Research	Teacher	Teacher	Not only formal assessment
	SS	**Bianca**	Mixed	Independent Research	Teacher	Mixed	Not only formal assessment
	2nd Language (Afrikaans)	**Melindy**	Facilitation	Group work and Independent Research	Teacher	Mixed	Not only formal assessment
	NS (Science)	**Adrienne**	Facilitation	Independent Research	Teacher	Teacher	Not only formal assessment
	NS (Science)	**Arlene**	Facilitation	Independent Research	Teacher	Teacher	Formal assessment

Table 56: Teachers interviewed with Competence Pedagogic Mode (PD-R with weak framing)

As seen in tables 55 and 56, the EMS teacher (Leena) interviewed perceives her regulative discourse as similar to teachers surveyed, however, ***all other teachers' regulative discourses do not appear to be directly related to the subject that they teach*** (PD-I). Within each subject grouping, there are teachers that possess performance and competence based pedagogic modes.

6.1.3 Summary of Professional Disposition (PD)

The interview data seems to suggest that teachers' instructional discourse (PD-I) is not directly related to their regulative discourse (PD-R), but rather, as discussed in chapter 5, their preferred pedagogic mode is shaped by their ***personal teaching style and characteristics*** (Afshari, et al., 2009; Zisow, 2000).

As mentioned previously as I am interested in studying teachers' adoption behaviours in relation to tablet use in the classroom, the constructs drawn from the conceptual framework will be used in the analysis and discussion of the interviews, relative to teachers' OTT.

6.2. Orientation towards Tablet Technology (OTT)

In order to answer the research sub-question, ***what are different teachers' Orientations towards Technology?*** Bernstein's (2000) conception of vertical and horizontal activities and Hooper's and Rieber's (1995) educational technology adoption model have both been used to discuss OTT.

6.2.1 Levels of Adoption (LA)

The survey findings imply that teachers with weakly or strongly classified and framed PDs possess strong OTT, and are reportedly the most enthusiastic and extensive adopters of tablets in the classroom. However, reasons for contradictory findings in relation to SS and Art teachers remain unclear. With the intention of providing a more in-depth understanding of the survey findings, interview data relative to the categories of Familiarization; Utilization and Integration; and Reorientation and Evolution is discussed below.

6.2.1.1 Familiarization (LA-F)

Interview questions related to this Level of Adoption are: (q17) *do you own your own tablet?* and (q19) *what do you use tablets for in your personal life?*

Survey findings suggest that at the present time, with the exception of English and NS teachers, all teachers think that they are comfortable using tablets in their everyday lives. Similar findings are present in the interviews of Maths teachers, where both Steve and Linda report that they are comfortable using tablets in their everyday lives, with Steve (Maths) using tablets *"for almost*

everything...sports coaching, capturing data and stats on games and matches...generally keeping in touch with the world" and Linda using tablets for *"email, internet research, reading and playing games"*. Amongst the SS teachers interviewed, Paul (SS) owns a tablet and uses it for the internet and Bianca (SS) uses her MacBook and phone for her personal emails and Pinterest. 2nd Language teachers interviewed make use of tablets for *"downloading scriptures, accessing emails"* (Sandile-2ndLang), playing games and *"keeping on board with the latest trends as to teaching and technology teaching"* (Melindy-2ndLang). Unlike the survey findings, in which teachers report that they are using tablets in their everyday lives, Leena, the EMS teacher, does not own a tablet and makes use of her smartphone extensively for *"reading the newspaper, doing a bit of movement on the stocks...then email, the Pinterest apps"*.

During the interviews with English teachers, Brent and Glenda indicated that they make extensive use of tablets in their everyday lives and use it for email, Twitter, playing games, banking and general productivity and organisational functions, while Dianne (Eng) does not own or make use of tablets in her everyday life. Similarly with NS teachers, different levels of Familiarization was found during the interviews with Adrienne (NS) using tablets for *"communication, reading newspapers online, getting information and books"* and Anne (NS) doing her banking, emails, playing games, Facebook and Skype on the tablet. Fabio (NS), however, makes *"very little"* use of tablets in his everyday life, whilst Arlene (NS) uses her smartphone for *"listening to music, accessing the internet, smsing, storing photos and personal organisation things"*.

6.2.1.2. Utilization and Integration (LA-U and LA-I)

Within the survey findings it was established that at the present time, teachers with either weakly or strongly classified and framed PDs seem to be making use of tablets extensively at the Level of Utilization and Integration, whereas teachers with mixed PDs, such as NS, 2nd Language and Art, are not making widespread use of tablet technology, at this level, in their teaching. An inconsistency with this finding is that certain SS teachers report that they are making use of tablets at this Level of Adoption.

6.2.1.2.1 EMS

Unlike survey findings, in which EMS teachers report that they use tablets extensively at the level of Utilization and Integration, Leena does not have her own iPad and is not using it for teaching. While Leena feels that she would *"like to have an iPad just to start exploring with it"*, she is *"not sure how to use it in the classroom...in accounting they have a hardcopy textbook...it is very much like Maths, you do calculations and then you get a result*".

6.2.1.2.2 Maths and English

Although English and Maths teachers were found within the survey to be strong adopters of tablet technology, it became apparent from the interviews conducted that the way in which these teachers are utilizing and integrating tablets in their teaching is significantly different. English teachers report that their adoption of tablet technology is mainly for enabling learners to *"make mind maps, adverts, comics...learners read on the tablets...using the eBooks I have made...I have made a poetry book and a language one...it's all on the tablet"* (Dianne-Eng); for "*classroom management...for me it's about remembering and connecting the dots in my day...I also use it for video editing every now and again...to create flipped lessons and looking up on the internet"* (Brent-Eng); as well as "*if there is something they are struggling with like nouns or verbs...they can just click on something that says noun, they get through a lot more content in a short time and they are more willing to do it...especially if it is a game*" (Glenda-Eng). Maths teachers report that they are using tablets mainly *"as a productivity device, from taking notes to doing that type of thing"* (Linda-Maths) and for *"communication, extension work, presentations, mind maps and study notes"* (Steve-Maths).

6.2.1.2.3 SS

Amongst SS teachers, Paul reports that he is using tablets *"for a number of apps...excel spreadsheets, Good Dreams, email, internet, there is just so much...searching, YouTube clips"*, whilst Bianca thinks that *"as long as the teacher has something"* there is *"no need to have a tablet"* but *"for the students, their needs are slightly different"*.

6.2.1.2.4 NS

Results of NS interviews are not as straightforward as the survey analysis seems to imply. Some NS teachers report that they are not using tablets because they don't know if *"in the actual teaching there is much scope for it"* (Fabio-NS), "*as there aren't many suitable apps...they are either at a low level or at university level"* (Fabio-NS), whereas other NS teachers report that they are using tablets *"for notes...what they would normally do in a book, they do on Evernote...apps like ShowMe to explain a concept or a calculation by verbalizing it rather than writing it...videoing experiments...explaining what they do....not only for an assessment but for a record of what they did in class...also a lot of research"* (Adrienne-NS).

6.2.1.2.5 2nd Language and Art

With 2nd Language teachers, tablet adoption appears to be more widespread than found in the survey, with teachers reportedly using tablets for *"mind maps....reading literature to come up with our own characters from pictures we have downloaded"* (Sandile-2ndLang), as well as *"creating workbooks which I give them on their tablet...the learning material has everything in...a video clip, notes, exercises....interactive stuff...games"* (Melindy-2ndLang). Similarly, Tina, the Art teacher, reports that

she is making use of tablets in the classroom:*"I use it a lot, a lot because I do all my slide shows on it...obviously all the pictures...it is my primary resource...I show videos, YouTube and all of that"*.

6.2.1.3 Reorientation and Evolution (LA-R and LA-E)

According to Hooper and Rieber (1995) the levels of Reorientation and Evolution are when teachers reconceptualise and re-evaluate their teaching practices by examining new technologies. Within the survey it was found that EMS, Maths, English and SS teachers all believe that tablets are reshaping their own teaching practices, as well as general teaching practices within formal education, whereas NS, Art and 2nd Language teachers were undecided.

6.2.1.3.1 Maths and English

With Maths teachers, Steve believes that tablets enable the reorientation and evolution of his teaching practices as he now *"looks at things a bit differently...while finding what works and what doesn't work is a lot of trial and error...which can be frustrating as a teacher but I've enjoyed it more, I think I am making a bigger difference...I am more on top of what the students are doing"*, whereas Linda thinks *"teaching should stay pretty much the same*", even though the tablet has the ability *"to make teaching a bit more interactive, a bit more exciting...a bit more concrete, a lot easier, it enables a lot more practice, online practice"* as well as *"saves time"*. English teachers interviewed think similarly to English teachers surveyed: *"before teaching used to be horrible...it was really kind of static with nothing changing...it's now far more dynamic, a lot more creative...for me it's made a huge difference* (Glenda-Eng). Dianne (Eng) thinks that tablets *"make teaching more relevant...it is handing the learning over to the students...you don't have the labour over notes...for me I don't have to do the thinking, someone else has done the thinking and the students must tap into the thinking and grow from there"*, and Brent (Eng) believes that *"it has made me more aware of the process...now I am less concerned about the curriculum....I believe in the process of what I'm doing, the students will get through the curriculum"*.

6.2.1.3.2 SS and EMS

Although Bianca, one the SS teachers, finds that her main use of tablets is for *"the productivity side"*, she believes that, a shift in pedagogy may be required as tablets provide students with *"all the information at their fingertips"* and therefore *"as teachers we need to teach them how to use or how to look for reliable resources"*. Paul believes that tablets allow him *"to do everything"* and *"makes it much more interesting"*, even though his teaching *"approach is really the same"* as it was before he started using tablets. Leena, the EMS teacher, thinks that *"at this stage the tablet doesn't aid her teaching"* and *"has not changed"* her pedagogic practice, as she thinks that using tablets *"makes it more complicated for the students, they've got enough to deal with what I am trying to teach them"*.

6.2.1.3.3 NS

Adrienne thinks that her pedagogic practice has changed since she started using tablets, as she *"has given over more to the students"* and is not so *"teacher-controlled"*. She believes now *"it must come from them...instead of me just producing the information I ask them to look at the internet for something and we then gather together what different people saw"*, however, if *"you don't do it properly...just make a focus of the tablet...it can detract from your teaching"*, it can also be *"a hindrance because it is just so lovely...there are so many things that you can do with the tablet...and we don't have enough time"*(Adrienne-NS). Anne also thinks her teaching has changed and has become *"a bit more exciting"*:*"instead of showing them what a cell membrane looks like"*, with tablets *"they can actually see the movement of the cytoplasm"*, which makes it *"easier to explain difficult concepts"*. On the other hand Fabio feels that tablets are *"just easier to carry around"*, but are not reshaping his pedagogic practice.

6.2.1.3.4 2nd Lang

2nd Language teachers interviewed believe that tablets are reshaping their pedagogic practices. Sandile thinks that despite the fact that *"apps are a big challenge"*, using tablets assists her in providing *"differentiated instruction...when I'm not there I can give them extended work"* and *"has made my life so easy...during my lunch I set a quick homework and email it to the students...I communicate with the students over chat...if they encounter a problem they can chat to me immediately"*. Melindy also thinks tablets *"gives learners the opportunity to be actively and interactively involved in the learning process"* as it *"opens doors for students to engage in the lesson...it has also opened doors for me not to be set in my ways...they will come up with their own life world"*. Before using tablets Melindy *"would read to them and it is the most boring thing in the world, you read and they just sit there and think about everything else"* whereas now *"if you use their knowledge and your content, you create a wonderful product"*.

6.2.1.3.5 Art

Similar to the survey findings in which Art teachers were undecided as to the ability of tablets reshaping pedagogic practices, Tina (Art) thinks that using tablets makes her *"a lot more prepared for lessons*" and "*allows more opinions into the classroom, which is always a good thing with Art"*. These abilities enable her to be a lot more flexible: as *"something comes to mind that wasn't necessarily there when you were doing your planning...it is easy...a lot more accessible information"*, however, tablets are not necessarily reshaping her pedagogic practice but rather are *"enabling students to do what I want in the format that I need"*.

6.2.1.4 Summary of Levels of Adoption

Overall, teachers' ***Levels of Adoption*** in relation to tablet technology ***does not seem to be subject specific*** (PD-I), but rather appears to be related to ***teachers regulative discourse*** (PD-R), personal ***teaching style*** (Zisow, 2000) and whether they have their own personal tablet and the amount of time they have had to become familiar and experiment with the tablet (Afshari, et al., 2009). It seems that teachers that favour *C**ompetence***-based pedagogic modes (PD-R) and ***are more familiar with using tablets in their everyday lives*** (LA-F) and appear to be ***adopting tablets more extensively in their teaching***, whereas those teachers that favour ***Performance*** based pedagogic mode (PD-R) and who are using tablets very little, or not at all, in their everyday lives, are either ***choosing not to adopt tablet technology in their teaching, or are using it mainly for internet access and classroom productivity***, as they believe that the benefits accrued are minimal. A possible reason for the decisions made by Competence mode teachers to adopt technology extensively in the classroom may be related to educational technology literature, in which the use of pedagogic constructivism is widely advocated (Jaffer, 2010).

In addition to the above argument, it seems from the interviews that the ***age of the teacher and teaching experience does not appear to be significant in the level of adoption***, as both younger (Bianca 21-25 years old) and older (Adrienne 55+ years old) teachers and more experienced (Dianne 31+ years), and less experienced (Brent 6-10 years) teachers make use of tablets in their everyday lives as well as in their pedagogic practice.

6.2.2 Manner of Adoption (MA)

Using Hooper's and Rieber's (1995) definition of a product technology, which supports current teaching practices, and an idea technology, which reorientates or innovates pedagogic practices, teachers interviewed were asked (q27) *whether they view the use of tablet technology in the classroom as a support to existing teaching practices or a means to reorientate it?* and (q26) *do you think this new technology will have a significant impact on formal education or is just a flash in the pan innovation?* Based on the finding that teachers' pedagogic modes are crucial in the decision of choosing whether to adopt tablets in the classroom, the analysis and discussion below is presented with PD-R, rather than PD-I, as the primary criteria[80].

6.2.2.1 Performance Pedagogic Mode

6.2.2.1.1 Support or Idea Technology

From the interviews it was found teachers that possess a Performance Pedagogic mode view the tablet mainly as ***support*** to their existing teaching practices. Fabio (NS) believes that *tablets "should be a*

[80] To simplify the reading of the interview analysis and discussion, where appropriate, subjects have been grouped together within each of these pedagogic modes.

support...I don't see that the basics can be taught or the learners can learn effectively with using the tablet", as does Anne (NS): "*it is a means to support definitely."* Linda (Maths) also believes "*it should be a support...in the real world you're never going to be totally tablet orientated...it has to mirror real life...even if you have a tablet you might not use it for days on end whereas other days you'll use it the whole day...that is how it needs to be used in the classroom"*. Sandile (2nd Lang) agrees that tablets "*should be a support"* because "*they still need me as a person in front of them, to instruct them and to be in touch with...they must feel what you're saying...technology can't help someone who can't pronounce stuff correctly, they won't get it, they still need me to do the stuff*". Although Paul (SS) thinks "*tablets should be a bit of both"*, his idea of "*tablets reorienting traditional teaching"* mainly focuses on increased use of tablets in terms of productivity capabilities such as "*email...they have notes on their tablet...I don't have to photocopy anymore"*. Leena (EMS), who does not make any use of tablets at the moment, believes that the only way that tablets will assist her is if she "*reorients, because at the moment it is not supporting me."*

6.2.2.1.2 Impact of Tablet Technology

In addition, teachers with Performance-based pedagogic modes think tablets will "*become entrenched"* (Anne-NS), "*probably because it is the thing to do"* (Fabio-NS), "*it's not going to revolutionize education...it's a productivity device"* (Linda-Maths). However, Leena thinks that "*in South Africa, where 70% of government schools don't have them,"* tablets may be "*just a flash in the pan."*

6.2.2.2 Competence Pedagogic Mode

6.2.2.2.1 Support or Idea Technology

While "*tablets in the hands of a bad teacher is not going to make that teacher a great teacher"* (Brent-Eng), English teachers mainly view the tablet as a means to ***reorient*** teaching, "*it's a reorientation more than a support...it can stimulate your imagination, your creativity, the way you do things...it does impact the way you teach"* (Glenda-Eng), "*one of the biggest things for me...it reframes the way we think about things, it opens doors to more collaborative learning, to connection with the outside world"* (Brent-Eng). However, English teachers also see the tablet as a ***support***: "*it definitely can support...it is just so much easier to keep up to date, you can just put in links"* (Dianne-Eng), "*it supports solid kinds of educational principles...teachers who are innovative and solid teachers anyway find amazing ways of using tablets...in support of exiting things"* (Brent-Eng). Steve (Maths) thinks tablets are a means to "*reorient teaching...for example with immediate feedback as a teacher you can see straight away if they're with you or not"*.

Although Bianca (SS) believes that "*there needs to be a reorientation of teaching"*, she doesn't "*see the tablet as being a replacement for the teacher, but rather as an aid to their teaching*." Tina (Art)

agrees with Bianca that *"at the moment tablets **support** the way I have always done things, it is making life a lot easier...with a subject like Art you need that interaction...there is no way that I could change the entire way I teach, to simply be technologically based"*. Melindy (2nd Lang) believes tablets *"are a bit of both"* as *"you need different approaches to keep them interested...there are other possibilities out there that I can use it for"*.

Arlene and Adrienne, the NS teachers with competence-based pedagogic modes both think that tablets should be used primarily to ***reorient*** teaching: *"you have to teach differently"* (Arlene-NS) because *"we can't just carry on teaching like we always taught...we have to approach kids differently...it's part of their experience...we have to embrace it...you can't have a school where there's no technology and life where there is"* (Adrienne-NS).

6.2.2.2.2 Impact of Tablet Technology

Competence mode teachers thinks *"tablets will have an impact on formal education"* (Tina-Art) as they *"are here to stay"* (Dianne-Eng), however, if *"tablets are the core of education and teachers become secondary...then tablets can just be a flash in the pan"* (Brent-Eng). But *"if introduced properly and well and significantly and teachers are empowered...it can make an incredible difference"* (Brent-Eng). Furthermore, the use of tablets is seen as *"so pervasive"* (Adrienne-NS): *"it's got such momentum that you're not going to necessarily stop it anyway"* (Tina-Art) "p*eople won't go back to the old school with blackboard and chalk...the kids have changed"* (Glenda-Eng) and *"this is so much easier"* (Adrienne-NS).

6.2.2.3 Summary of Manner of Adoption

Overall, it seems that *teachers with **strong Performance Pedagogic modes do not see tablet technology as a means to reorient their teaching***, and although they believe that tablets are here to stay, they are unsure as the extent by which tablets are reshaping formal education beyond the enhancement of productivity. Teachers with ***strong Competence Pedagogic modes also believe that tablet technology is a support***, however, in addition, they are ***also using tablets to reorient traditional teaching practices*** and believe that if implemented correctly, they can have a significant impact on formal education.

6.2.3 Current Adoption Activities, Types and Frequency (AA-C)

While LA and MA are important, as mentioned previously, it is the type of activities that teachers use or envisage using technology for (Hooper & Rieber, 1995) that provides a more insightful and deeper analysis into one of the research sub-questions of ***how teachers are currently using or envisage using tablets in their teaching.***

To get a sense of current types of activities, the following questions were asked during the interviews: (q4) *does your subject lend itself to being taught with tablets*; (q5) *does using tablet technology enhance your teaching?* (q13) *how does using tablet technology enable your aims of teaching?* and (q21) *can you describe how you have used tablet technology in the classroom?*[81]. Whilst the interview analysis and discussion presented below is primarily categorized by teachers' PD-R, the types of activities have also been grouped according to subjects as defined in the survey[82]. Where the tablet is being used for an activity that has not been defined in the survey, a new category has been created.

6.2.3.1 Performance Pedagogic Mode

In the interviews, teachers that possess a Performance Pedagogic mode report that they are mainly using tablets for internet access and classroom productivity. In relation to ***internet access***, teachers are using tablets for (1) **looking up information**: *"I can go onto Google at any time and look up different kinds of fluid mosaic models"* (Anne-NS), *"I can download whatever apps there are"* (Sandile-2nd Lang), *"I can keep up to date...look at how other people are doing things"* (Linda-Maths), and for (2) **showing videos**: *"little YouTube clips, you can send it to the students"* (Linda-Maths), *"I can use so many different films and video clips*" (Paul-SS). In relation to ***classroom productivity***, teachers are using it for (1) **creating presentations**: *"I create beautiful presentations"* (Paul-SS); (2) **creating students notes**: *"I create notes"* (Linda-Maths); (3) **communication**: *"we email each other"* (Sandile-2nd Lang); (4) **posting notes resources**: *"I send students the notes"* (Leena-EMS); *"put model answers on Drop Box"* (Anne-NS), as well as to (5) **save time**: *"instead of drawing 10 graphs, you can do the 10 graphs on the tablet and they can actually see the trends"* (Linda-Maths).

For ***new concepts and relevance***, none of the performance based teachers indicate that they are using tablets for (1) **project based work**, while for (2) **simulations** Linda (Maths) and Anne (NS) are using tablets for *"visualizations...now with 3D they are able to spin the shape, actually see it...without physically having to make the shapes"* (Linda-Maths) and for dissection because *"when I am dissecting some of them can't take it, so I've got an app that does the dissection for them"* (Anne-NS). Paul (SS) is using tablets to create (3) **relevance**: *"I can be teaching Stalin and I can show them a YouTube video clip...it makes it more interesting"* and Anne (NS) is using tablets to (4) **explain new concepts**: *"to introduce a topic"* and for *"difficult to understand concepts...the kids have struggled to understand in the past, but when I show them layer, by layer..."*.

[81] Based on the finding that teachers' pedagogic mode is crucial in the decision of choosing whether to adopt tablets in the classroom, the analysis and discussion will be done with PD-R as the primary criteria.
[82] Internet access; practice of skills; new concepts and relevance; classroom productivity and collaborative learning

Only Linda (Maths) is using tablets for ***practice of skills***: "*online practice, there are so many programs that you can use to practice basic skills, video clips...to reinforce what you've done*", and none of the performance based teachers interviewed are using it for ***collaborative learning***.

6.2.3.2 Competence Pedagogic Mode

In the interviews, teachers that possess a Competence Pedagogic mode report that they are also using tablets for internet access and classroom productivity**.** In relation to ***internet access***, teachers are using tablets for (1) **looking up information**: "*you've got immediate internet access...you can just look up something"* (Arlene-NS), "*they can access the artwork much quicker" (Tina-Art), "it is easy to hop onto Google and find the picture"* (Tina-Art), "*they do a lot of research on it" (Adrienne-NS), "when you're teaching adverts...it's a wonderful platform, they can access the advert" (Dianne-Eng)*, and (2) **showing videos**: "*I show them a little video"* (Bianca-SS), "*I show videos on YouTube and all of that"* (Tina-Art).

For ***classroom productivity***, teachers report that they are using tablets to (1) **show and create presentations**: "*I do all my slide shows on it"* , because as "*art is a visual subject, you can't teach it without a visual aid"* (Tina-Art), "*I do a lot of PowerPoints which I then project"* (Bianca-SS), "*I use it to create beautiful multimedia presentations"* (Brent-Eng); (2) **create notes**: "*I use it for all their notes" (Adrienne-NS), "I have made my own eBook"* (Melindy-2ndLang), "*I've made a poetry eBook and a language one, it's all on the tablet"* (Dianne-Eng); (3) **communicate**: "*I do my emails on it every day" (Tina-Art), "I use it for classroom management" (Brent-Eng)*; (4) **post student notes and resources**: "*I post all their notes and stuff on Drop Box, so they can access whatever they lose"* (Melindy-2ndLang), "*videos that I myself have created, they can have it anytime and go through it"* (Adrienne-NS), "*we have created a whole lot of flipped classrooms that we load onto Edmodo and they can go home and watch"* (Glenda-Eng); as well as to (5) **save time**: "*it speeds things up" (Tina-Art).*

For ***new concepts and relevance***, tablets are being used for (1) **project work**: "*to create short little films reels on the French Revolution"* (Bianca-SS), getting students "*to actually do presentations...like little Khan Academy videos...they have to explain what they are doing...I can then see if they understand the concept or they don't"* (Steve-Maths), "*making a comic book on the Merchant of Venice...making adverts"* (Dianne-Eng)", "*videoing experiments annotated with what they did, explaining why something happened"* (Adrienne-NS), "*websites and eBooks as a resource for one their friends"* (Glenda-Eng); (2) for **simulations or visualizations**, Adrienne (NS) reports that she is using tablets to "*show them things that are abstract...it makes it easier for them to look at visualizations or videos";*(3) for **relevance**, tablets "*makes what they are learning relevant"* (Arlene-NS; Dianne-Eng)

For ***practice of skills***, Melindy (2nd Lang) and Glenda (Eng) report that they are using tablets, as *"they have it available on dropbox, extra activities all of them"* (Melindy-2nd Lang), *"if there's something that they are struggling with like nouns or verbs....they can just click on something that says noun, they get through a lot more content in a short time"* (Glenda-Eng).

Some teachers report that they are using tablets to enable ***collaborative learning***, Dianne (Eng) believes that with tablets students can see *"someone else has done the thinking and they must just tap into that thinking and grow from there"*, and Adrienne (NS) thinks that tablets can be used *"to make a podcast or one of the apps to produce something instead of just doing a calculation"* (Adrienne-NS) and Glenda (Eng) lets students *"use their tablets in groups...it helps me interact with them...the content is more fluid"*.

In addition to the type of activities defined in the survey, some of the teachers with Competence pedagogic modes report that they are using tablets for ***marking***: "I mark directly into the student database" (Tina-Art), *"I also mark online"* (Glenda-Eng); ***extension work***: *"they're not just sitting by idly not knowing what to do, they've got stuff and it gets marked*" (Steve-Maths); and as a ***learning tool***: *"to make mind maps...as study notes...it is quite nice and easy, you just click on a little button and it falls into place"* (Steve-Maths), *"I use it to make mind maps"* (Bianca-SS).

6.2.3.3 Summary of Current Adoption Activities, Types and Frequency

Overall, it was found that all teachers interviewed report that they are using tablet technology for ***internet access and productivity purposes***. Teachers with strong ***Performance based*** pedagogies are almost exclusively using tablets for these purposes, whereas ***Competence based*** teachers are making use of the other capabilities and benefits offered by tablet technology.

6.2.4 Envisaged Adoption Activities, Types and Frequency (AA-E)

To get a sense of the types of activities that teachers envisage that in the future they will use tablets for, the following questions were asked during the interviews: (q23) h*ow do you envisage tablet technology being used in the future?* and (q24) *how would you like to use tablet technology in the classroom?* The interview analysis and discussion presented below is primarily categorized by teachers' PD-R.

6.2.4.1 Performance Pedagogic Mode

6.2.4.1.1 General Pedagogic Practice

Performance based teachers envisage that in the future they will use tablets to ***improve communication and access to information***: *"more communications, gathering information...saving*

time and money" (Sandile-2nd Lang), *"finding information that students need...email"* (Anne-NS), *"teachers can communicate from their homes"* (Paul-SS), whereas some teachers think tablets will be used to *"empower students to do their own practice, their own research"* (Linda-Maths) and "*enhance the learning experience...and the teacher experience"* (Leena-EMS).

6.2.4.1.2 Personal Pedagogic Practice

In relation to their own pedagogic practice, Sandile (2nd Lang) envisages that in the future she will use tablets to ***improve her teaching***: *"to enhance my teaching, to share with teachers"*. Anne (NS) would like to use tablets for ***increased communication*** so that students will be able *"to submit work to me...ask more questions, communicating whatever they feel they need to know"*, and Paul *"would like tablets to do my **marking**"*. Linda (Maths) would like to use tablets for more ***collaboration and interaction***: *"use it more interactively...posing the question that we could then investigate...understanding how everything links together"*, and Leena (EMS) thinks that in the future she will *"only use it for **content**...because I want them to listen and think."*

6.2.4.2 Competence pedagogic Mode

In the interviews, some Competence Pedagogic mode teachers *"can't see how we would use it differently to how we're using it now...except we would use it for more"* (Adrienne-NS), *"I suppose more or less like we use it now"* (Arlene-NS). *"Technology needs to become a natural part of the teacher-learner toolbox, integrated only...when it's necessary...not designing lessons around the technology"* (Brent-Eng). In general Competence based pedagogic mode teachers envisage that in the future the tablet will assist with ***communication and productivity*** as *"more lessons and content can be online...that would speed things up"* (Glenda-Eng), as well as enable ***students to be more self-directed***: in their learning experience "*they can prepare themselves, read through the slideshows and everything before...then they would have the background and information, so it's not completely foreign to them"*. Tina (Art) *"I really see the kids becoming part of the learning process...taking responsibility for the learning...taking ownership"* (Melindy-2nd Lang). In addition, teachers think tablets in the future will be used to ***enhance creativity***: *"it can do so much for you, you're not limited-you can think big"* (Dianne-Eng), for *"creating...be it videos or some sort of media"* (Bianca-SS), and ***improve teaching resources***: *"I think it could replace a lot of things like textbooks"* (Arlene-NS), *"used for notes and textbooks"* and *"sharing a lot of what we're doing in less privileged schools"* (Bianca-SS).

6.2.4.2.1 Personal Pedagogic Practice

For their own pedagogic practice Adrienne (NS) believes that in the future, tablets will be used, to ***create relevance***: *"to link to the outside world...in class we will get information from other sources and back up what is fundamental stuff"*, whereas Tina (Art) would like to use tablets for ***creativity -***

tasks: *"I would encourage them to do a lot of video work...the majority of artwork that they will go out and study will be digitally-based"*. Dianne (Eng), in the future, would like to use tablets to improve ***classroom interaction and communication***: *"I'd like to go the whole Twitter route...I think it is really good in getting the kids to communicate succinctly" and* Steve (Maths) would like to ***improve evaluation****: "I would like to bring in more assessment type things...students can sit and watch a lesson and in the middle they get questions...I can immediately see who has understood what I just taught"*.

6.2.4.3 Summary of Envisaged Adoption Activities, Types and Frequency

Most teachers seem to envisage that in the future tablets will be more integrated into their teaching. ***Competence based pedagogic mode teachers*** envisage that in the future, ***tablets will be used more extensively and creatively*** in the classroom, whereas ***Performance based teachers*** primarily envisage that in the future, tablets will be used to ***improve communication and productivity***. As mentioned in the survey analysis and discussion chapters, teachers' visions that in the future they will shift towards a greater use of tablets, is consistent with the findings that teachers need time to be able to become comfortable and confident with using the tablet as a teaching tool in the classroom (Sackstein & Spark, 2012).

6.2.5 Summary of Orientation towards Tablet Technology (OTT)

Teachers' regulative discourse combined with personal teaching styles, have been found to predominantly shape teachers' technology adoption choices. ***Competence*** Pedagogic mode teachers (PD-RC) appear to be choosing to ***adopt tablet technology more widely in their teaching***, whereas the majority of ***Performance Pedagogic mode teachers*** (PD-RP) appear to be choosing to adopt tablet technology in their teaching ***primarily for internet access and classroom productivity***. However, some of ***PD-RP*** teachers are also ***carefully selecting*** to use tablets in more creative ways, where they believe it will ***enhance their teaching***. A possible reason for teachers with PD-RP not choosing to adopt tablet technology extensively in all their teaching, may be due to the widespread advocacy within educational technology literature, that tablet technology is most effectively adopted by teachers with strong PD-RC (Cuban, 1986, 1993; Hooper & Rieber 1995; Jaffer, 2010). Teachers' age and years of teaching experience were found in the interviews to be insignificant factors.

6.3 Relationship between Professional Disposition (PD) and Orientation towards Tablet Technology (OTT)

Subject Taught (PD-I)	Teachers' Name	Levels of Adoption (LA)	Manner of Adoption (MA)	Adoption Activities (AA)
Performance Pedagogy (PD-R with F++)	*Leena (EMS)* *Linda (Maths)* *Fabio (NS-Science)* *Anne (NS-Biology)* *Sandile (2nd Lang-Zulu)* *Paul (SS-History)*	• Familiarization (LA-F) • Utilization (LA-U) • Integration (LA-I)	• Mainly as a Support (MA-P)	• Internet access • Classroom productivity • New concepts and relevance • Practice of skills
Competence Pedagogy (PD-R with F- -)	*Tina (Art)* *Brent (English)* *Dianne (English)* *Glenda (English)* *Steve (Maths)* *Adrienne (NS-Science)* *Arlene (NS-Biology)* *Bianca (SS-History)* *Melindy (2nd Lang-Afrik)*	• Familiarization (LA-F) • Utilization (LA-U) • Integration (LA-I) • Reorientation (LA-R) • Evolution (LA-E)	• Support (MA-P) • Idea (MA-I)	• Internet access • Classroom productivity • New concepts and relevance • Practice of skills • **Collaborative Learning** • **Marking** • **Extension Work** • **Learning Tool**

Table 57: Summary of interview analysis and discussion of Professional Disposition and Orientation towards Tablet Technology

"It is more about how you use the technology rather than the technology itself...for me it's still about the teacher not the device" (Brent-Eng). Bringing together the interview findings on Professional Dispositions and Orientation towards Tablet Technology, with the intention of answering this study's main research question as to ***whether a relationship exists between teachers' Professional Dispositions and their level and form of adoption or non-adoption of tablet technology in the classroom***, it seems that ***teachers' instructional discourse (PD-I) does not significantly affect teachers OTT.*** Rather it is the ***combination of their regulative discourse (PD-R)*** and ***personal teaching style*** that ***shapes their decisions*** to adopt or not to adopt tablet technology in the classroom. However, the ***types and frequency of Teaching Adoption activities*** that teachers report they are using tablet technology for, seem to be related also to their ***instructional discourse*** (PD-I). These findings do not imply that subject and subject-specific skills (instructional discourse) are irrelevant, and that Hoadley's and Ensor's (2009) definition of Professional Disposition is not valid, but rather suggests, as Bernstein (2000) did, that the ***instructional discourse is embedded in and shaped by the regulative discourse***. A summary of the findings are provided in table 57 above

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusions

This study set out to answer the main question of *whether a relationship exists between teachers' Professional Dispositions and their level and form of adoption or non adoption of tablet technology in the classroom,* in order to establish if teachers have *principled reasons* for their decisions to adopt or not to adopt tablet technology in the classroom. To answer these questions the study has drawn on the constructs of Professional Disposition and Orientation towards Tablet Technology, developed in the conceptual framework. From the data collected, it can be concluded that *teachers' preferred pedagogic mode is predominantly responsible for influencing teachers' technology adoption choices in the classroom*. These findings affirm Bernstein's (2000) theorization of the instructional discourse being embedded in the regulative. Despite the regulative discourse being dominant, these findings *do not imply that the teacher's instructional discourse has no role to play*. Rather, they suggest the initiating conditions in the adoption or non-adoption of tablet technology are shaped by teachers' pedagogic mode, whereas the *activities teachers select tablet technology for, appear to be influenced by their instructional discourse.*

For the *regulative discourse* it was found that teachers with more *competence based pedagogic practice* were found to be *more enthusiastic* about adopting technology in their teaching, whereas teachers with more performance based pedagogic practice were less enthusiastic about tablet adoption in the classroom. For the *instructional discourse*, teachers who recognize their subject as having a *vertical knowledge structure* tend to use tablet technology primarily as a product technology (MA-P), in support of their current teaching practices, and as an idea technology (MA-I) very selectively, whereas teachers who recognize their subject as having a *horizontal knowledge structure*, in addition to using tablets as a product technology (MA-P), are widely experimenting with tablets as an idea technology (MA-I) to reorientate their pedagogic practice. Notwithstanding this finding, the use of tablet technology for *internet access* and *productivity related tasks* was found to be unanimously and extensively adopted by teachers, whereas the use of tablets for collaborative activities still remains elusive to most teachers. Furthermore, it was found that teachers envisage that in the future their usage of tablets in the classroom will increase irrespective of their Professional Disposition and Orientation towards Tablet Technology. However, there may be different reasons as to why this increase is expected.

Based on the findings in this study it seems as if one can conclude that *teachers do have principled reasons for their tablet technology adoption choices*.

7.2 Limitations of Study

7.2.1 Sample

The size of the *survey sample was small* and therefore, whilst findings give a sense of the research problem, they are not generalizable at the moment beyond this teacher population. In addition, as the study was conducted at *advantaged private schools* where the level and quality of teaching is usually high, therefore the findings may not be representative of the wider teacher population

As the survey was completed online and was anonymous, *it was not possible to interview the same teachers as answered the survey*. Furthermore, due to the size of the survey sample, the *categorization of all forms of Art under one subject grouping* for the survey analysis may not have been the most optimal means to gauge these teachers' opinions

7.2.2 Research Design

In this study, findings are based on teachers' *self-reporting*, rather than classroom observation, and therefore teachers' accounts of tablet use may not always be consistent with their actual use. In addition, one cannot be sure that respondents *interpreted the constructs and related questions* in the same way.

With the privilege of hindsight, *confirmatory questions* in the survey may not have added value to the findings and possibly have made the instrument *too cumbersome*. Furthermore, the *grouping together of different constructs* and *types of adoption activities* into one question, *made it difficult to interpret* some of the responses. It was also noted that probing teachers' knowledge of applications available for teaching their subject was omitted.

The way in which the *learning areas of NS, SS and EMS are constituted* in South African education, may have been responsible for the mixed dispositions found in these subjects, as it was not possible tin the survey to ascertain which subject the teacher originated from. The reason being that *teachers' original areas of specialization*, which was found to be an important factor within the interviews, *was not accessible from the survey data.*

The *grouping of all 2nd Language teachers* under one subject grouping in the survey, did not allow for a distinction between *South African based* 2nd Languages and *other additional languages*. This may account for the findings in relation to this subject grouping.

7.3 Recommendations

7.3.1 Field of Curriculum Studies

It is frequently the case that academics adopt an advocacy position or undertake open-ended ethnographic studies in relation to the adoption of technology in the classroom; this study establishes

the need to use a *theoretical framework* to facilitate a *more principled understanding* of the issues underlying teachers' technology adoption decisions.

7.3.2 Schools and Educators

7.3.2.1 Schools

The use of *tablet technology should not be viewed as simply a mechanism to change and shift existing teaching practices* but rather, schools should seek to understand the reasons behind teachers' technology adoption choices. Furthermore, schools need to acknowledge that *teachers have different Professional Dispositions and pedagogic practices,* and simply *prescribing blanket tablet adoption policies may not be advantageous* for the improvement of teaching and learning at their schools. Schools need to be conscious that *teachers with more competence based pedagogic modes tend to be more enthusiastic adopters of tablet technology* and thus could be useful ambassadors for tablet technology adoption programmes. Likewise, given that teachers with more *performance based pedagogic modes tend to carefully select activities* that they perceive will enhance their pedagogic practice, therefore schools should consider their carefully selected choices, as they may offer a more reasoned approach to tablet adoption in the classroom. Importantly, schools should not only view the use of tablet technology in the classroom as *effective and successful when teachers shift to using it as a collaborative tool,* because using tablets to support existing teaching practices is also essential

Schools need to appreciate that *teachers need time to become familiar with using tablets* in their teaching and thus tablet adoption programmes should give teachers time to play and experiment, in order to allow them to *explore possibilities of using tablets* in their pedagogic practice.

Finally, schools should be aware that *more experienced and older teachers have established economies of classroom practice and may not wish to invest the level of effort* required to integrate tablet technology into their teaching.

7.3.2.2 Educators

Before adopting technology in the classroom, teachers should *seek to understand their Professional Dispositions,* as this will provide insights into the nature and extent to which adopting tablet technology may enhance their pedagogic practices. Furthermore, teachers should be encouraged to explore the capabilities of tablets where they *believe it can enhance their teaching*, and *not simply adopt tablet technology because it is required* by school management, or due to widespread advocacy.

7.3.3 Technologists

Technologist should be aware that *technology is a human activity* that is not reducible to a machine, therefore when implementing technology adoption policies the *human aspect needs to be carefully considered*.

7.4 Future Research

As this study only addressed a small sample of private schools with *1:1 programmes*, it would be beneficial to carry out this study in other private schools with *varied implementations.*

As this study only collected data at advantaged private schools, to be able to investigate whether *differences or similarities exist between social classes* in relation to the level of teachers, technology and learners, it would be beneficial to conduct a similar study at government schools.

This study only used *teachers' self reported accounts* of technology use, and therefore to get a sense of how teachers' accounts of tablet technology use compares with their actual use, it would be beneficial to conduct a follow up study in which classroom observation is used.

This study's findings established that teachers' *personal teaching styles are important* in shaping technology adoption choices. It would therefore be beneficial to investigate the *relationship between teachers' personal teaching styles and their Professional Dispositions*, in order to provide a more in-depth way of understanding teachers' technology adoption behaviours.

This study asked teachers to predict their future tablet adoption behaviour. To investigate whether their *envisaged use is similar to what they expected*, and if time did in fact play a role in increasing their use of tablets in the classroom, it would be beneficial to follow up with the teachers interviewed.

7.5 Afterword

Due to my background in the field of Information Systems, when I embarked on my Masters in Education, I held strong beliefs that teachers should adopt tablet technology in the classroom in order to enhance teaching and learning, and that their choices not to adopt technology was flawed. I therefore initially approached the idea of research into technology adoption with the intention of convincing teachers that adopting tablet technology is essential. During this journey I have come to appreciate the complexities of the relationship between teaching and technology and have reframed my technology position as *"tech or tablets in the hands of a bad teacher is not going to make that teacher a great teacher but rather, it is solid educational principles"* (Brent-Eng) that make the difference.

APPENDICES

Appendix A: Online Survey Instrument

(adapted from Bernstein, 2000; Hoadley & Ensor, 2009; Hooper & Rieber, 1995; Chen, 2010).

The online survey is divided into four sections.

The *first* section captures *demographics* of the teachers in relation to the subject taught, gender, age, cell phone usage and teaching experience in order to get a sense if there are any similarities between each of these factors in relation to teachers' adoption or non adoption of tablet technology.

The *second* section is based on the literature reviewed in relation to teachers' *Professional Disposition* (questions 1-18).

The *third* section is based on literature reviewed in relation to *teachers' Orientations towards Tablet Technology*. This section is split into 2 different streams depending on whether teachers are **currently using tablets** (questions 19-39) AND/OR **envisage using tablets** (questions 30-58) in the future. A 5-point Likert scale used by respondents indicates their answers ranging from 1-strongly disagree to 5-strongly agree in relation to Levels (extent) of tablet adoption and Manner of tablet adoption.

The *fourth* section addresses the *use of the tablet technology*, by asking teachers to report on which type of activities they are currently using or envisage using tablet technology for (question 59-63). This section is split into current and envisaged activities. A 5-point Likert scale has been employed to indicate frequency of use (Daily, Weekly, Monthly, Every few months and Never).

Section 1
Subject Taught, Demographics, Cellphone Usage and Teaching Experience

Instructions
Please answer the following questions, in order to enable the researcher to get a sense of the demographics of respondents

Please indicate which subject/s you currently teach
- ○ English
- ○ Second Languages (such as Afrikaans, Hebrew and French)
- ○ Mathematics
- ○ Natural Science
- ○ Social Science
- ○ EMS
- ○ Life Orientation

Please indicate you Gender
- ○ Male
- ○ Female

Please indicate the age category in which you fall
- ○ 21-25 years old
- ○ 26-35 years old
- ○ 36-45 years old
- ○ 46-55 years old
- ○ 55+ years old

Please indicate which cell phone you currently use

- ○ Non-internet enabled Cellphone
- ○ Internet enabled Cellphone
- ○ PDA

Please indicate the number of years you have been teaching for

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-20 years
- ○ 21-30 years
- ○ 31+ years

Section 2

Professional Disposition (PD) (based on Bernstein's (2000) pedagogic discourse as well as Hoadley & Ensor (2009) Professional Disposition, teachers' ID and RD and their degree of classification and framing is being questioned).

Instructions

- Please answer the following questions, indicating your agreement or disagreement to the statements or questions posed.
- Strong disagreement is indicated by choosing option 1, mild disagreement option 2, neutral option 3, mild agreement option 4 and strong agreement option 5.
- Please use the definitions below as a guide in relation to the differences between everyday and school knowledge.

Definitions

- ***Everyday knowledge*** refers to "local, context-dependent, specific, tacit and multilayered" knowledge (Bernstein, 2000, pg157)
- ***School-Knowledge*** refers to systematically organised knowledge with "specialized symbolic structures of explicit knowledge" (Bernstein, 2000, pg160).

1. There are significant differences between the subject that I teach and everyday knowledge (PD-I)
2. The subject that I teach requires learners to develop specialised attitudes (PD-I)
3. The subject I teach is directly related to learners' everyday knowledge (PD-I)
4. The use of everyday examples can block the development of understanding in my subject (PD-I)
5. Tasks learners do in my subject must be closely related to their everyday lives (PD-I)
6. Learners cannot learn new concepts or complete tasks in my subject unless they have mastered all of the previous concepts taught (PD-I)
7. Unless learners do independent research alone or in groups, it is difficult to learn my subject (PD-R)
8. Without explicit instruction from me, it is difficult to learn my subject (PD-R)
9. To teach my subject it is better to facilitate learning rather than use direct instruction (PD-R)
10. A more relaxed pacing and sequencing of lesson content is preferable for my type of teaching style (PD-R)
11. The sequence in which learners learn concepts or do activities in my subject is very structured (PD-R)
12. Learners should have a lot of leeway in relation to the sequence of what they learn (PD-R)
13. Tight control of lesson pace is important to me (PD-R)
14. Learners should have leeway in relation to the pace at which they work (PD-R)
15. Group work is an essential part of learning in my subject (PD-R)
16. I seldom use group work in my classes (PD-R)

17. Learners must demonstrate creativity in responding to most of the assessment tasks in my subject (PD-R)
18. In most of my assessment tasks there are clear criteria for right and wrong answers (PD-R)

Section 3

Orientation towards Tablet Technology (OTT) (based on Hooper and Rieber's (1995) model of educational technology adoption and technology activities as developed in the conceptual framework)

Instructions

- Please answer the following questions, indicating your agreement or disagreement to the statements or questions posed.
- Strong disagreement is indicated by choosing option 1, mild disagreement option 2, neutral option 3, mild agreement option 4 and strong agreement option 5.
- Please use the definitions below as a guide to the researcher's intentions as to the terms tablet technology, current tablet technology use and envisaged tablet technology use.

Definitions

- ***Tablet Technology*** refers to any flat, graphic, one-piece device that uses either touch or digital pen instead of a keyboard or mouse (Dictionary.com, 2010).
- ***Current tablet technology use*** refers to teachers' accounts of the tangible activities and tasks that they are currently using tablet technology for in the classroom.
- ***Envisaged tablet use*** refers to those activities that teachers report they would like or expect to use tablet technology for in the future.

Current Account of Use

Levels of Adoption (teachers' accounts as to the extent to which tablet technology enables their teaching)

Manner of Adoption (teachers' accounts as to the way in which tablet technology is being used)

Adoption Activity (teachers' account as to the nature of activities that are being carried out with tablet technology)

19. I am comfortable with using tablet technology in my everyday life for my own personal needs (LA-F and AA-H)
20. I am confident in using tablet technology to enable teaching and learning in the classroom (LA-U, LA-I)
21. It is easy to use tablet technology to support my own teaching style (LA-U, LA-I)
22. A major advantage of using tablet technology for teaching is that it enables me to cover more content during my lessons (MA-P and LA-U, LA-I)
23. A major advantage of using tablet technology for teaching is that it enables me to explain content more effectively to learners (MA-P and LA-U, LA-I)
24. A major advantage of using tablet technology for teaching is that it enables me to pace lessons more effectively (MA-P and LA-U, LA-I)
25. A major advantage of using tablet technology for teaching is that it enables me to motivate learners during my lessons (MA-P and LA-U, LA-I)
26. A major advantage of using tablet technology for teaching is that it provides me with new and different course material (MA-P and LA-U, LA-I)
27. I am comfortable using tablet technology for productivity related tasks in the classroom (AA-C)
28. It is easy to integrate my existing course material with tablet technology (LA-U, LA-I)
29. A major advantage of using tablet technology for teaching is that it enables more relevant teaching (MA-P and LA-U, LA-I, LA-R and LA-E)
30. Tablet technology has enabled me to reorient my current teaching style (MA-I and LA-R, LA-E)
31. Tablet technology has enabled me to innovate and change my current teaching style (MA-I and LA-R, LA-E)

32. Tablet technology enables the reorientation and evolution of current teaching practices (MA-I and LA-R, LA-E)
33. A major advantage of using tablet technology for teaching is that reshapes formal education (MA-I and LA-R, LA-E)
34. Using tablet technology enables me to better educate learners (MA-P or MA-I)
35. A major advantage of using tablet technology for teaching is that supports my current teaching style (MA-P)
36. I use tablet technology in my teaching because I find tablets easy to use (AA-C)
37. I have had to expend considerable effort to become comfortable with using tablet technology in my everyday life (AA-H)
38. In general, I am comfortable with new technologies (AA-H, AA-C)
39. I have had to expend considerable effort to become comfortable with using tablet technology in my current teaching (AA-C)

AND/OR

Envisaged Account of Use

Levels of Adoption (teachers' accounts as to the extent to which tablet technology can enable teaching)

Manner of Adoption (teachers' accounts of the way that tablet technology can be used)

Adoption Activity (teachers' accounts as to the nature of activities that can be carried out with tablet technology)

40. I expect that I will be comfortable using tablet technology in my everyday life for my own personal needs (LA-F and AA-H)
41. I expect that I will be confident when using tablet technology in order to enable teaching and learning in the classroom (LA-U, LA-I)
42. I expect that it will be easy to use tablet technology to support my own teaching style (LA-U, LA-I)
43. I expect that a major advantage of using tablet technology for teaching is that it will enable me to cover more content during my lessons (MA-P and LA-U, LA-I)
44. I expect that a major advantage of using tablet technology for teaching is that it will enable me to explain content more effectively to learners (MA-P and LA-U, LA-I)
45. I expect that a major advantage of using tablet technology for teaching is that it will enable me to pace lessons more effectively (MA-P and LA-U, LA-I)
46. I expect that a major advantage of using tablet technology for teaching is that it will enable me to motivate learners during my lessons (MA-P and LA-U, LA-I)
47. I expect that a major advantage of using tablet technology for teaching is that it will provide me with new and different course material (MA-P and LA-U, LA-I)
48. I expect that I will have to expend considerable effort to become comfortable with using tablet technology in my current teaching (AA-E)
49. I expect that a major advantage of using tablet technology for teaching is that it will enable more relevant teaching (MA-P or MA-I and LA-R, LA-E)
50. I expect that it will be easy to integrate my existing course material with tablet technology (LA-U, LA-I, LA-R and LA-E)
51. I expect that tablet technology will enable me to innovate and change my current teaching style (MA-I and LA-R, LA-E)
52. I expect that tablet technology will enable me to reorient my current teaching style (MA-I and LA-R, LA-E)
53. I expect that tablet technology will enable the reorientation and evolution of current teaching practices (MA-I and LA-R, LA-E)
54. I expect that using tablet technology will enable me to better educate learners (MA-P or MA-I)
55. I expect that a major advantage of using tablet technology for teaching is that it will reshape formal education (MA-I and LA-R, LA-E)

56. In general, I am comfortable with these new technologies (AA-H, AA-E)
57. I expect that I will have to expend considerable effort to become comfortable with using tablet technology in my everyday life (AA-H)
58. I expect that I will be comfortable using tablet technology for productivity related tasks in the classroom (AA-H and LA-F, LA-U)

Section 4

Please use the 5-point Likert scale (1-Never; 2-Every few months; 3-Monthly; 4-Weekly; 5-Daily) to indicate the frequency ***you currently use or have used*** tablet technology for your teaching in relation to the following activities (AA-H, AA-C)

My current use of tablet technology involves:

59a. Accessing the internet to look up general information related to knowledge that you are teaching
59b. Accessing the internet to show a video related to knowledge that you are teaching
60a. Drill and Practice
60b. Creating online assessments and quizzes for your learner
61a. Teaching new concepts
61b. Creating relevance to specialised knowledge
61c. Simulations and project based work
62a. Creating and showing a presentation to your learners
62b. Posting class notes or recording of class
62c. Sending email communications to learners and their parents
62d. Creating and uploading of your notes
62e. Creating a video to enable your teaching
63a. Enabling learners to create online content through the use of wikis or blogs
63b. Enabling collaboration of learning amongst your learners and their peers

Please use the 5-point Likert scale (1-Never; 2-Every few months; 3-Monthly; 4-Weekly; 5-Daily) to indicate the frequency ***you envisage using*** tablet technology for in the future for your teaching in relation to the following activities (AA-H, AA-E)

My envisaged use of tablet technology involves:

59a. Accessing the internet to look up general information related to knowledge that you are teaching
59b. Accessing the internet to show a video related to knowledge that you are teaching
60a. Drill and Practice
60b. Creating online assessments and quizzes for your learner
61a. Teaching new concepts
61b. Creating relevance to specialised knowledge
61c. Simulations and project based work
62a. Creating and showing a presentation to your learners
62b. Posting class notes or recording of class
62c. Sending email communications to learners and their parents
62d. Creating and uploading of your notes
62e. Creating a video to enable your teaching
63a. Enabling learners to create online content through the use of wikis or blogs
63b. Enabling collaboration of learning amongst your learners and their peers

Appendix B: Interview Instrument

(adapted from Bernstein, 2000; Hooper & Rieber and Chen, 2010).

The interview is divided into two sections.

The *first* section of the interview captures the demographics of teachers in relation to subject taught, gender, age, cell phone usage and teaching experience in order to see if there are any similarities between each of these factors in relation to teachers' adoption or non adoption of tablet technology.

The *second* section is based on the literature reviewed and concepts of Professional Disposition (PD) (questions 1-14).

The *third* section is based on literature reviewed in relation to teachers' Orientations towards Tablet Technology (OTT) (questions 17-24).

The *fourth* section probes general feelings towards technology innovation through teachers' views of past and future technology innovations (question 15 and 25-28).

Section 1

Subject Taught, Demographics, Cellphone Usage and Teaching Experience

Instructions

Please answer the following questions, in order to enable the researcher to get a sense of the demographics of respondents

Please indicate which subject/s you currently teach

- ○ English
- ○ Second Languages (such as Afrikaans, Hebrew and French)
- ○ Mathematics
- ○ Natural Science
- ○ Social Science
- ○ EMS
- ○ Life Orientation

Please indicate you Gender

- ○ Male
- ○ Female

Please indicate the age category in which you fall

- ○ 21-25 years old
- ○ 26-35 years old
- ○ 36-45 years old
- ○ 46-55 years old
- ○ 55+ years old

Please indicate which cell phone you currently use

- ○ Non-internet enabled Cellphone
- ○ Internet enabled Cellphone
- ○ PDA

Please indicate the number of years you have been teaching for

- 1-5 years
- 6-10 years
- 11-20 years
- 21-30 years
- 31+ years

Section 2

Professional Disposition (PD) (based on Bernstein's (2000) pedagogic discourse as well as Hoadley & Ensor (2009) Professional Disposition , teachers' ID and RD and their degree of classification and framing is being probed).

What subject/s do you teach? (PD-I)

1. How do you view the importance of the subject that you teach? (PD-I)
2. What are the joys and challenges of teaching your subject? (PD-I)
3. Which sections do learners find challenging or exciting in your subject? (PD-I)
4. Does your subject lend itself to being taught with tablet technology? Explain your answer. (PD-I and PD-R)
5. Does using tablet technology enhance your teaching? Explain your answer. (PD-I)
6. In your opinion is your subject directly related to learners' everyday knowledge? (PD-I)
7. In your opinion is your subject directly related to the context in which it is taught? (PD-I)
8. In your opinion does your subject build on previous knowledge in a systematic manner? (PD-I)
9. Describe your approach to teaching this subject (PD-R)
10. Describe your views in relation to the teacher controlling the sequencing of lesson content as opposed to the learner? (PD-R)
11. How do you feel about learners controlling the pace at which they work? (PD-R)
12. What are views as to independent research or group work by learners as opposed to formal teacher instruction? (PD-R)
13. How do you feel learners should be assessed? (PD-R)
14. How does using tablet technology enable the aims of your teaching? (PD-I or R)
15. Describe the characteristics of a teacher whom you believe would be effective in adopting tablet technology in relation to content knowledge and styles of teaching and Orientation towards Tablet Technology. Explain your answer (PD and OTT)

Section 3

Orientation towards Tablet Technology (OTT) (based on Hooper and Rieber's (1995) model of educational technology adoption and technology activities as derived from the literature reviewed)

17. Do you have your own tablet?
18. Have you used tablet technology in your personal life and/or the classroom?

- If the **teacher has used tablet technology** either in their personal life or their professional role, then **section 3a and section 3b** was asked.
- If the teacher **has not used tablet technology**, then **only section 3b** was asked.

Section 3a (if the teacher is using or has used tablet technology)

- *Levels of Adoption* (teachers' accounts of the extent to which tablet technology does enable teaching)
- *Manner of Adoption* (teachers' accounts of the way in which tablet technology is being used)
- *Adoption Activities* (teachers' accounts as to the nature of activities that are carried out with tablet technology)

20. Can you describe how you have used tablet technology in your personal life? Please illustrate with actual examples. (AA-H and LA-F)

21. Can you describe how you have used tablet technology in the classroom? Please illustrate with actual examples. (LA and MA)
22. Can you describe how you have changed your teaching due to the use of tablet technology. Please illustrate with actual examples. (LA and MA)

Section 3b (the teacher's report of how he/she envisages using tablet technology)

- *Manner of Adoption* (teachers' accounts of the way in which tablet technology can be used)
- *Adoption Activities* (teachers' accounts as to the nature of activities envisaged to be carried out with tablet technology)

23. How do you envisage tablet technology being used in the classroom? (MA-P or MA-I and AA-E)
24. How would you like to use tablet technology in the classroom? (AA-E)

Section 4

General questions

25. International research suggests that past technological innovations have not been successful, why do you think this is the case? (PD and OTT)
26. Do you think that this new technology, tablets, will have a significant impact on formal education or is it just a flash in the pan? (PD and OTT)
27. Comment on whether you view the use of tablet technology in the classroom as a support to existing teaching practices or rather as a means to reorient it? Explain why you hold this view. (MA-P or MA-I and LA)
28. What are your views with regards to the statement that tablet technology can improve the quality of formal education? Explain your answer. (MA-P or MA-I)

Appendix C: Ethics Forms

Teacher Information Participation Letter

June 2013

Dear Teacher,

I am a researcher, from the School of Economic and Business Sciences at the University of the Witwatersrand (Wits), with an interest in the associated changes resulting from technology adoption in various contexts. I am currently completing my Masters in Education (MEd) and am presently focussed on the adoption of technology from an educational perspective. The use of tablet technology for Grade 9 learners and teachers at (*school name*) has presented me with an opportunity to carry out academic research to investigate **teachers' orientations towards tablet technology in** South African private secondary schools. **This research holds no preconceived notions as to whether teachers should or should not adopt tablet technology in their classroom but rather aims to understand reasons and factors that may affect adoption behaviour.** Aside from its academic value, the study results may inform educational institutions as to teachers' orientations towards educational technology and may also inform technologists about issues related to technology adoption from an educator's perspective.

This research forms part of a wider research study that is currently being conducted in relation to the expectations and utilization of tablet technology within private secondary schools within South Africa. As a teacher, you are invited to take part in this study so we can capture what you think and how you feel about your teaching and using tablet technology as part of your pedagogic practice. Your participation is entirely voluntary and involves no risk, penalty or loss of benefits whether or not you choose to participate.

The research will be conducted in two phases. If you agree to take part, you will be required in the first phase to fill in an online survey and in the second stage may be asked to participate in an interview thereafter. However, agreeing to fill in the survey does not necessarily mean you are obliged to be interviewed in the interview; therefore you can complete the online survey and not take part in the interview. You may withdraw from the survey at any time and you may also refuse to answer any questions that you feel uncomfortable with answering. Your honest answers are important and there are no right or wrong answers.

The survey will take approximately 30 minutes to complete. It is designed to be taken online however if you would prefer to complete a paper-based survey, arrangements will be made. As the electronic survey does not retain any information about who initiates the survey and the paper based survey does not require you to reveal your name, your confidentiality and anonymity is ensured.

Interviews with a small number of teachers from the pool of teachers who completed the survey will be arranged in order to glean more textured insights into some of the issues raised from the surveys. If you agree to participate in the interview, which will last approximately 30 minutes, arrangements will be made at a time and place that is suitable for you.

With your permission, the interview will be recorded and notes will be taken. No one other than the researchers will have access to the recordings or notes taken. To ensure your confidentiality your name and personal details will be kept confidential. It will not be possible to trace responses back to any individuals and results will therefore only be reported in the aggregate. The recording, notes and surveys will be kept until no longer needed for producing publications, thereafter it will be destroyed.

There will be no direct benefit to you from the research, but a report back on the research's findings will be made available to you and the school.

The ethics for conducting this research was approved unconditionally by the Wits University Human Research Ethics Committee (Non-Medical), Protocol Number: H120314.

Thank you for considering participating. Should you have any questions, or should you wish to obtain a copy of the results of the survey, please contact me on 011 717 8160 or email Suzanne.Sackstein@wits.ac.za or my supervisor Lynne Slonimsky on 717-3184 or lynne.slonimsky@wits.ac.za.

Regards
Suzanne Sackstein
Principal Tutor
School of Economic and Business Sciences
University of the Witwatersrand, Johannesburg

Teacher Consent Form

Project Title: Teachers' Professional Dispositions and Orientation to Tablet Technology: towards a more nuanced understanding of teachers' adoption of technology in South African private secondary schools

Researcher: Suzanne Sackstein

I volunteer to participate in a research project conducted by Suzanne Sackstein from the University of the Witwatersrand. I understand that this research project is designed to study teachers pedagogic practices and orientation to tablet technology at (school name) in order to provide a more nuanced understanding of teachers' adoption behaviour

As a teacher at (school name), I understand that I am being invited to take part in a survey and/or interview. I understand that in agreeing to participate:

- My participation is voluntary. I understand that I will not be paid for my participation.
- The survey will take approximately 30 minutes to complete.
- The interview will last approximately 30 minutes. Notes will be written during the interview and/or an audio taped. I can decline to be recorded.
- I understand that if I feel uncomfortable in any way during the interview I have the right to decline to answer any question or to leave the interview session.
- I understand that the researcher will not identify me by name in any reports using the information obtained from the survey or interview. My confidentiality as a participant will remain secure. Subsequent uses of recordings and data will be subject to standard data use policies which protect anonymity of individuals and institutions.
- Administrative and other teaching staff at (school name) will neither be present during the interview not have access to raw notes or transcripts of either the survey or the interview. This precaution will prevent any of the findings having personal negative repercussions for me.
- If I choose to be interviewed, I have the right to view and comment on the transcribed interview data before the findings are analyzed.
- I have read and understand the participant information sheet provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.
- I have been given a copy of this consent form.

I hereby agree / disagree (circle the applicable option) to participate in the **survey** for this study.

I hereby agree / disagree (circle the applicable option) to participate in the **interview** for this study.

I hereby agree / disagree (circle the applicable option) to the **audio recording of my interview** for this study.

Name _____

Signed _____

Date _____

APPENDIX D: Sample Transcription[83]

Name	Brent
Subject	English
Gender	Male
Age	36-45 years old
Cell phone	Internet enabled
Years teaching	6-10 years

How do you view the importance of the subject that you teach? (PD-I)
It's, it's quite strange...my view is, is that **the content is not necessarily that important** but uhm I see **English as a**, as a **subject that teaches life**, so I think **a lot of the content really** engages particularly novels and poetry **gives a platform to speak about real issues, so it's more about shaping a character for me** rather than content in particular, **although I do think that the communication skills that they are learning here are important**, I have a really sort of real world application view of things like that so, you know, **kids also need to communicate in the real world not just for me.**

What are the challenges of teaching English, specifically? (PD-I)
I think a lot of the **kids don't think it's important so they don't take it seriously often, a big challenge in a boys school is getting boys to read**, I think that **reading is an incredibly important skill**, and boys just resist reading with a passion, so **the challenge is to**, is to **try and inspire the boys to read, find things that they would like...**

Why is reading important?
On many levels, for me it is what **it develops in your brain**, the connections that develop there, also just **exposure to what's happening in the world**, and uhm **finding** information, **assessing information** uhm **analyzing what is important**, uhm the basic understanding I think reading improves that, **I think the more you read the more you are able to process and understand information in a short period of time**

What are the joys of teaching English? (PD-I)
For me it's all about **the relationship to be honest**, I **think it gives an incredible platform to just relationally connect with youngsters**, I am passionate about that, I am passionate about **being involved in their lives and shaping them**, so uhm and that's a joy for me.

Why is that particular to English?
(Pause) maybe I shouldn't say this, but **I don't think we are as curriculum focused in English** as maybe the other subjects are, so **it lends itself to a more personal approach**, I don't think that is the case in every class, but that's my approach.

What sections do your learners find exciting? (PD-I)
I'd like to think everything that they do in my class is exciting, uhm because I, I try and make it that I think the sections that I think may be less exciting, maybe there's an easier way for me to answer are **for example grammar lessons and those of more difficult for me to make it exciting**

Are they less exciting or challenging or both?
Well I think because **they're more challenging they disengage quicker if you're not on the ball** uhm or **don't have significant ways of engaging them with the content**.

Do you think that your subject lends itself to being taught with tablets? (PD-I and PD-R)
I do, I think so but **to be honest I think I would be doing similar creative things without tablets** but I do think that **tablets make it easier for me to do what I want to do.**

How?
(Sigh) this is a long answer, there's so much, uhm for me **content creation is one of them, is that I can create content and can push content to them that is relevant** and uhm (pause) and uhm....I mean **if you don't have a tablet you have to access 3 or 4 different resources to get the kind of impact** that I want to get, **but if I create my own iBook** or whatever the content, **everything that I want is in there**, websites are embedded, **videos** are embedded, **quizzes are embedded**, **the works** I mean I think if you can create a widget for an iBook,

[83] Exact words used in the interview analysis chapter have been highlighted in purple.

it's in there, and that's what I like about it. Uhm, secondly I think, I think there is a deeper learner engagement, so uhm I think that, **I think tablets provide the opportunity to engage more deeply**, I think....

How?
(Sigh) apps I think, **I'm wary saying it's all about apps because I don't think it's all about apps**, I think apps if, **if they're used in the right way** but..let me give you an example, uhm if **I ran a competition with my boys**, I can....there're various ways of interacting that they wouldn't be able to before, and....you can do that with smartphones as well, I see that as in the same category smart phones and tablets are for me..... for me it's more about technology, you can have responses like...., **in the old days you would have to buy an expensive clicker system to get that kind of response** on the whole or something like that, we use a lot of apps where the **boys can actually have competitions against each other**, which you project against the screen, boys **love competition and that competition creates a deeper engagement.**

My whole philosophy is about creating what I call learning milestones and I believe that the tablet allows me to do that, so uhm for me a learning milestone would be a **significant moment to which boys would attach meaning**, so you can have fun moments in class but those will maybe be remembered just for the fun moment that they are, but if you design them properly, the boys attach meaning to that, so if they think back on a fun moment they had or the significant milestone they had, which isn't always fun, but it might be a moment of enlightenment or they've realized something, if there is meaning attached to that moment then it is learning milestone, so whenever they think of that learning milestone they'll remember that thing. So I do that with tablets and without tablets, but I find with the right space and if I find the right tool on the tablet to create those milestones, that engagement is significant, the boys will say to me after an exam, you know I had this stupid thing, I can't remember even remember what I did it for and I had this thing that I did this strange thing with my hands and the boys came out of the exam at the end of the year and they said "we remembered your hands" and so you know uhm **often that way I use the tablet kind of creates those moments.**

So are you saying that tablet technology enhances your teaching because it makes them more engaged or it's more exciting? (PD-I and PD-R)
I think to a certain extent it's that, **I think it's more about how you use the technology rather than the technology itself,** uhm so for example I don't use a lot of English apps, I will find things that I think might create significant moments or be useful in a certain context and I don't... I often don't use that till months down the line but I'll make a note of it and bury it in my...

Has it given you accessibility to stuff that you never had before?
Yes, **I think it's the accessibility to tools, also the ease of things, I mean back in the days if you wanted to boys to create a video it was a nightmare**, because someone would have to have camera, someone would have to be able capture video off the tape, you would need some hard core editing suite, **now you can film, edit, package everything on one device and push it to wherever you need it to go.** Things like that, **there's a convenience to it. I'm wary of saying that the tablet itself is deeply engaging, because I think to a large extent even multimedia stuff is fairly static, I think it's what you do with the device and how you use the tools on the device to create those moments that are significant**, **for me it's still about the teacher, it's not about the device,.**

In your opinion, is English directly related to learners' everyday knowledge of concepts? (PD-I)
I think **there're some key parts** of (pause) English and what we try and do with the **English classroom that help them engage in other subjects**, so we were talking about **reading** earlier, I mean that's, they learn to uhm get **boys to read and help them to understand what they're reading** and read uhm deeply into texts, that **impacts every other subject**, so I think that there's relevance in that. Uhm, in just understanding, I don't... I mean....it's hard to....**I love literature so for me it's incredibly relevant but I don't know in the real world if it's really relevant unless there's some real world application** which is what **we try and do when we teach** and **maybe it's** a lot about **those soft skills, those emotional skills the way boys think, you know the way** uhm **interact with the world that really has an impact rather than learning about the structure of the novel.**

In your opinion is your subject dependent on the context in which it is taught?
Can you explain what you mean by that question?

So, is the way we teach English in South Africa maybe slightly different to way we would teach it in Singapore or Hong Kong or at St Albans as opposed to somewhere else?
Ya, I think it is, I mean...

So it is context specific?
Ya, I think it's context specific, uhm I think, I think I've more freedom at St Albans than I've had at other schools that I've taught, where other schools it's been a lot of content and been simply about content, here I have more control over how I design my own curriculum, because ultimately, even for matric, we're teaching....we need to be teaching boys to think critically about texts that they need to analyze, we can teach them the right answers, but actually they going to do really well if they can think beyond the text or think critically about whatever they're engaging with.

In your opinion, does your subject, English build on previous knowledge taught in a systematic manner? (PD-I)
I think it does, I think **English is taught fairly systematically at junior school,** and we find particularly with boys from some of our feeder schools, they have been taught really systematically so they'll know everything, they won't **necessarily know how to apply that or recognize those things, you know in a different context, for example figures of speech** or...

But could they know how to apply something without having learnt it in a systematic manner?
I think so...**I think some parts of the English syllabus come very intuitively to kids** but you know, but **things like the parts of speech or figures of speech, you need to know those things before you can understand the meaning that comes from them**, uhm.

Describe your approach to teaching this subject? You said you want to engage them, you want to have a personal relationship with them? (PD-R)
I think **a lot of the way I teach also has**....especially or particularly with the grade 9 class I teach, uhm a lot of it has to do with, with **what it means for them in the real world,** so, I, I put, so I put myself in their shoes 5 years from now or maybe **10 years from now**, when they're a young upstarted company or whatever, **what do they need to know, what's going to help them then,** so even when, you know when **kids do speeches for me** or they do presentations for me, a lot of my learning is project based or **career based and stretching them into places they haven't been before** and making them feel uncomfortable. **The whole idea** for me is, **is if one day they are in the boardroom and they need to stand up and make a presentation** on the fly or whatever, **they will have the skills to do that** because uhm and, so a lot of it has to do with, I think a lot about the real world and how what I do impacts the real world. I also, **I also want to foster a love for language** and...because not a lot of boys love language or words or novels or plays, so part of it is about that for me, and I believe a lot that **if the boy is deeply engaged in the subject and has a, has a positive experience in class, that there's a relational connection**, that their, **their love for the subject can grow** out of that, we say at St Albans that "boys learn teachers not subjects", and particularly with boys that seems to be....uhm there's been a fair amount of research around the world on that, that the boys connect relationally and **when they connect relationally, the learning seems to happen**, ya.

Describe your views you've kind of alluded to this in relation to the teacher controlling the sequencing of lesson content as opposed to learners? (PD-R)
Maybe I have a bit of a hybrid approach, I mean I'm quite particular that....particular **in my lesson design** in that, I...**there are moments that I envisage** and I mean I'm not an academic so some of this is like I have a gut feel about something and I just do it uhm, but I tend to envisage those moments and they often work out differently to how I envisage them so I have **a kind of end goal in mind or, and real outcomes that I'd like the boys to**, to be able to uhm **exhibit or have grappled with** uhm and so it's a bit of a hybrid approach, cause I have an idea of what that moment should be, **but a lot of it's in their hands**, I'll often leave it in their hands, **they'll often guide the learning or that process or the direction they want to take it.**

So how do feel about learners controlling the pace at which they work? (PD-R)
I actually....you know, **I love that idea**.....

But?
But **I think that the system we find ourselves in**, so the system for me **is very limiting**, I spent some time now **in Canada** with my brother and his kids and I was just so encouraged by, I'm sure there're issues with their systems as well, I was just so encouraged by how **their educational system allows learners to, to flourish at their own pace**, for example my niece who has just finished grade11 is actually already finished 2 of her subjects, and so...so her final year at school there is very much...there's a mix of, she's working, she's at school, **I think she's having a richer experience than a grade12 here who we have in a very structured, very constricting kind of space**, uhm so I'm a big fan of kids learning at their own pace, I think the way our **schools**

in South Africa are currently structured doesn't allow for this and that frustrates me endlessly, a colleague of ours taught in Finland for a while and the stuff he shared about how the Finnish system works, I mean, I really resonate with that, **kids being able to design their own curriculum in a sense or choosing a path with an advisor and being able to work at their own pace, and engage with stuff they want to engage with,** I mean again **with reading, I think part of the reason that boys hate reading**, from primary school **they are forced to read books they don't like, if you just give them books that they connect with, they'll love reading.**

What are views as to independent research and group work as opposed to formal teacher instruction? (PD-R)
I'm not a big fan of...although I love talking and I often have to apologize to the boys for talking too much just cause I enjoy engaging with them, **I'm very pro uhm inquiry based learning that is guided**, uhm and I'm, I'm, **I'm pro group work at times and also the power of the pair**, I really.... I mean I read quite a bit, I haven't read a lot of like proper research on it, there is a lot anecdotal type of stuff about the power of the pair, boys or students working in pairs, so I try and have a good mix of all of that, uhm but I do think, I do think, you know **if you think about how long kids can actually concentrate, I don't think a teacher centred approach is...has much value beyond a couple of minutes**, uhm when I do speak a lot I often bring the boys either in a circle or they come sit with me so we are together and **I try and make it more of a dialogue than me talking all the time**, so I will often asked uncomfortable questions in order to get to a place where I can speak about something.

How do you think learners should be assessed? (PD-R)
Not like we assess them now (laugh) I think there are huge issues with our assessments, uhm with the way...I think we assess too much, first of all, especially in junior high, like grade8-10, **I think we assess excessively**, uhm I don't think.....this **whole thing of continuous assessment is a farce in South African, it's not really that it's a bank of tests**, for me that's not continuous assessment, **I'm constantly assessing** my boys, so in the class I'm **making mental notes**, I'm t**aking notes but in reality on a mark list at the end of the term, that means nothing,** uhm **a lot of the teachers frown at the way I assess, I allow boys often to bring crib notes into tests**, uhm, uhm and I had an issue a while back when there was an exam and my boys has notes and they had a big fight with the teacher cause they said and I'd forgotten to tell the teacher that they could bring these notes in, and they basically had 5 mind maps and one of those would be the essay for the exam, so they could easily score 90%, cause the idea for me is not they...**the idea for is not they that necessarily know a lot but that they engage with the process**, the process **is important for me**, and I don't think we acknowledge the process enough. We find with boys there's this exponential, so for 3 years they'll give me mediocre and then in their final 2 years, they kind of fly academically, so we're nailing them and saying "you're like an average student because of the way you test" but actually it's just part of the process, uhm **I would prefer us to assess more globally and cross-curriculum, so that the real world skills become apparent**, I'd love us to assess **in a more open ended way**, **so a maths exam would maybe be 3 questions and they would have the whole day to grapple through that and come up with something meaningful,** so they have **to apply what they've learnt, I think how we assess is very knowledge based, so they are collecting rather than connecting dots**

How does using tablet technology enable the aims of your teaching, you've said it makes it much more convenient, it can make it more engaging, but yet it's still a tool? (PD-I and PD-R)
Well what I've found particularly....if I'm really honest with you, I probably use, **I use a hybrid of, of technology myself** as a teacher**, so I won't always use my tablet for everything**, I use it now and again for me **in the hands of the student it's an incredible content creation tool which allows them the creativity** and I think it's also up to the teacher to respond to a task in any way they would, so I don't define for my boys, if I give them a task to do I don't define what the end result must look like, I just say "you have this tool, it can do many things, you guys decide how you're going to present this", **some can use it to simply write an essay and others can use it to create a beautiful multimedia presentation or a combination of things** uhm so I think in the hands, in the hands of kids...**that is a game changer for me, because you have one device**, first of all with a lot of content that they need but also with the ability to create content, uhm a lot of the people have said that tablets are not content creation devices, I disagree, I think they are, I think they're powerful content creation devices, I do think that **we do need to not think of them as a PC but as a tablet and it's a different tool that you can create powerful and amazing things, if you know where to look, so I introduce my boys to a lot of tools and then give them the freedom to choose and select.**

So you obviously have your own tablet?
Yes, I do.

Can you just tell me what you us the tablet for in your personal life? (AA and LA)
You mean not for teaching at all, my personal life?

Not for teaching?
Ok**, I use it for email, I'm a Twitterholic**, so I'm on Twitter all the time, **for reading** uhm, ya so a lot of it for me has to do with **engaging with the world around me because the life I have is incredibly busy so my Twitter feed keeps me up to date**, I only follow people who post interesting things and things I'm interested about, and that keeps me engaged uhm, I'm.... ya, I mean I don't know what else I actually use it for to be honest, email, Twitter...I **must be honest I play games now and again**

Candy Crush?
Hey no I don't play Candy-crush, **I play Angry birds**....I mean **I use it a lot for school, I create a lot of content**

So in the classroom you create content, you allow the boys to create content, you do what else? (LA, MA and PD-R)
I use it for **classroom management, I mean you can connect to our intranet here** whatever, so my mark book and everything is connected uhm to the tablet, uhm I (pause) mean...I use 3 devices, I mean I have an Apple laptop and this and I have an iPad and they sync seamlessly so **for me it's a lot about remembering and like connecting the dots in my day** as well uhm

So planning?
Ya, **planning**, I use all 3 devices together, I use it to **project a lot of stuff**, uhm I **do video editing every now and again** on my iPad, I use it **to create flipped lessons**, uhm...

You look up on the internet?
Ya I **look up on the internet.**

How was your teaching changed due to using the iPad? (LA and MA)
(Sigh) I think **I've become more aware of the process** rather than, than being focussed....but I had a 7 year gap in my teaching so teaching sort of 10 years ago when I left teaching uhm was very different to 3 years ago when I returned, or maybe I would say the way I think about things is very different, I was in a government school back then, and I think...**I do think I was a creative teacher but it was very much getting through the curriculum whereas now we are less concerned about the curriculum**, and we do have a curriculum to get through but **I believe that in the process of what I'm doing, the boys will get through the curriculum.**

How do you envisage the tablet being used in the future within education? (MA-I or MA-P and AA-E)
Personally I'd like, I know that I use the word hybrid a lot but it's, it's a little bit of a kind of, uhm what's it called, uhm it's a word I use a lot these days, because I think it's....**I would like to see schools not have technology programmes but technology just be an integral and natural part of what they do and that's why I like the hybrid approach,** uhm I've noticed it even in my 1 on 1 iPad class, **I actually encourage boys to bring other devices**, so you'll often in my1 on 1 iPad class, you'll see boys with laptops and smart phones and other things because it's good...**a good approach is to integrate all these technologies together**, uhm so I think **technology is an integral part of prime learning, will take place but I think schools make a mistake when they make it a selling point**, it's something that we're doing, we're on the cutting edge technologically and **it becomes all about the devices and which device we're using, I think it needs to become a natural part of the teacher-learner's tool box** uhm, uhm so that it's integrated into everything and **when it's not necessary, it's not necessary and people are ok if they, with the fact they, they don't use an iPad for a week**, but if a certain part of work or a part of the syllabus or whatever you're doing, lends itself to a particular technology that then you harness the power of that, **too many teachers I feel are designing their lessons around technology rather than saying "what are the sound pedagogical principles that, that are universal" and then, and then seeing well is there is a tool that can meet that need**.

So you've answered this question which is how <u>you</u> would like to use tablet technology in the future, but do you think that tablet technology is a support to existing teaching practices or a way to reorientate it? (AA-E and PD-R)
It's a bit of both, I mean I've always said, I've always said tech or tablets in the hands of a bad teacher is not going to make that teacher a great teacher and so I think it does support you know solid technological things, or I mean **solid kind of educational principles will be supported by technology** and I think I've found just in my own practice that teachers who are, who are **innovative and kind of solid teachers anyway find**

amazing ways of using tablets, in a support to existing things, but I do think, I do think **the technology reframes the way we think about things, I think it opens the door to more collaborative learning**, I think **it opens the door to connection outside of the classroom, I think that's one of the biggest things for me,** I teach beyond the classroom all the time, because I am connected with, with the boys I teach in a much better way, uhm 7 years ago or 10 years ago I would never have been able to do the stuff I am doing with them now, the way I communicate and share information and give them extension work and that kind of thing.

What are the characteristics that a teacher would need to have to would you think to be affective in adopting technology? (PD and OTT)
For me teachers are traditionally like....**it's easy for teachers to fall into a rut and so I think modern technology is very intuitive** and so you know, **I've seen people who are very resistant to it actually just decide to engage for a bit and then they're A for away** because, because **they think that new technology is like old technology** so 10 years ago they tried to use a complicated smart board and computer system and it kept crashing and it didn't work and they pushed the wrong button and they deleted the program and it wasn't very user friendly, for me **technology has become a lot more user friendly.**

So you're saying they should be persistent?
Yes, I think persistence is one thing, for me **more than persistence it's about playing, I did**, I did uhm a **2 day sort of iPad integration course** at Epworth down in Pietermaritzburg for them there and I was shocked that they, they had, **they'd taken teacher bonuses** and instead of giving them bonuses, they'd **bought everyone an iPad** and they had given them the iPads and had said we're going to start using these, so 2 months after they'd given these things out, they had this or a month after, so they gave it to them **before the holidays, after the holidays** they had me in there saying ok how do we integrate this into...well I'm thinking flip you've given me 2 days for this, I can only sit one on one with people, **so I ask guys to take out of their iPads, some of those teachers** probably about 20 of them **took out a box,** took out a box, **took the cellophane off**, the cellophane hadn't even come off and they'd it for a month, and what I said to them is...actually what I said to them at the end of those 2 days, cause still after those 2 days people were incredibly overwhelmed, I understand why they're overwhelmed, I said, I said to them you must just....if you're going adopt this you need to do it next year, **let these people play, they need to use it as a personal device 1st, they need to get used to it**, and I don't think they took my advice and I think **their program is struggling to get off the ground**, I think they've got some tech gurus who are happy to run with it, and have used the technology before, and I think that's what **schools need to do, people need to engage with the device like this, they need to play**, they need to know that it's not going to bite them, they're not going to break it, they **need to see the value of it**, so here at St Albans, what I've sort of maybe pushed myself into this role, but I've spent a significant amount of time with teachers just introducing them to the technology saying "don't be scared of it, play with it, this is what you can do, this is how I'm using it, I'm not saying it's best practice and I'm not saying you should use it but just see what I'm doing, does this...do you engage with this, do you feel excited about it" and my experience has been as when, when you're gracious in your approach like that and **you allow people to play, to make mistakes and you give them significant opportunity to engage with the technology** in a significant way, when the **pressure isn't on for them to perform, they actually end up not even needing you anymore**.

International research suggests that past technological innovations, have failed in education why do you think, one sentence? (PD and OTT)
(Pause) I think, uhm I think it's what we were speaking about right now, I don't think they're adopting it in the right way, I think you need buy-in from teachers and you need to empower teacher rather than frighten them away.

Do you think this new technology, tablets, will have a significant impact on formal education or it is just a flash in the pan innovation? (PD and OTT)
I think **it can very easily be a flash in the pan innovation**.

Why?
It's this **whole thing about, about teachers being the core of education and not tablets and a lot of schools are making tablets the core of education and teachers are becoming secondary and so that's why it can be a flash in the pan, I think if it's introduced properly and well and significantly, and teachers are empowered I think it can make an incredible difference.**

So the focus should still be the teacher not the technology, it's irrelevant which technology...
It's irrelevant which technology, if you'd spoken to me 2 years ago I would have been far more persistent about tablets now I don't actually...I don't think it matters (laugh).

What are your views as to this comment that 'tablet technology can improve the quality of formal education'? (PD and OTT)
Wow that's a loaded question and it's a hard question to answer cause **I think it can improve it in so many ways** uhm just some of the stuff tablets we're doing with tablets here **can translate into early realities in the textbook crisis in Limpopo for example, flipped lessons, facilitated learning** uhm there's a lot of that, uhm what's the question again

Can it improve the quality of formal education?
I think it can but I don't think it is, currently to a large extent

Because of the implementation?
Yes, **because of the implementation** and because of, I hope you're not going to publish this, because of people like Apple and others, I think it's different in the States but here the Core Group just pushes tablets because they want to sell product and that's where it's, it's falling to pieces, I think.

Recorded 33mins:25seconds

APPENDIX E: Supplementary Data Tables

Levels of Adoption (LA)

Envisaged Utilization and Integration

To assess teachers' accounts of ***envisaged*** use of tablet utilization and integration in the classroom the following statements were posed: ***Pedagogic Practice*** (q41) *I expect that I will be confident when using tablet technology to enable teaching and learning in the classroom*; (q42) *I expect that it will be easy to use tablet technology to support my own teaching style*; (q48) *I expect that I will have to expend considerable effort to become comfortable with using tablet technology in my teaching;* (q49) *I expect* that *a major advantage of using tablet technology for teaching is that it will enable more relevant teaching*; (q50) *I expect that it will be easy to integrate my existing course material with tablet technology.* For ***Pace of Lessons*** (q43) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to cover more content during my lessons*; (q45) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to pace lessons more effectively.* For ***Relevance to Learners*** (q44) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to explain content more effectively to learners*; (q46) *I expect that a major advantage of using tablet technology for teaching is that it will enable me to motivate learners during my lessons.* For ***Improved Lesson Content*** (q47) *I expect that a major advantage of using tablet technology for teaching is that it will provide me with new and different course material.*

Subject	Number in Group (n)	Q41 Median Will be confident using tablets in the classroom	Q41 IQR	Q42 Median Will be easy to use tablets to support teaching style	Q42 IQR	Q48 Median Will spend effort	Q48 IQR	Q49 Median Will enable more relevant teaching	Q49 IQR	Q50 IQR Will be easy to integrate	Q50 IQR
EMS	5	**5.00**	1.00	**5.00**	1.00	**5.00**	**2.00**	4.00	0.00	4.00	1.00
Art	4	4.00	0.25	4.00	0.25	**2.50**	1.13	3.00	**2.25**	3.50	**1.50**
Maths	10	4.00	0.75	4.00	1.75	**2.00**	1.00	4.00	1.00	4.00	**1.50**
SS	7	4.00	1.00	4.00	1.00	3.00	**1.50**	4.00	1.00	4.00	**1.50**
English	9	4.00	1.00	4.00	1.00	4.00	**2.00**	4.00	1.00	3.00	1.00
2nd Lang	7	**3.00**	0.50	**3.00**	0.50	3.00	**1.50**	3.00	**1.50**	**2.00**	0.50
NS	4	**3.00**	0.50	**3.00**	0.25	**4.00**	0.50	4.00	0.75	**2.50**	**1.75**

Table AE1: Subject teachers' accounts of Envisaged Pedagogic Practice (q41, q42, q48[84], q49, q50)[85] – Median and IQR Values

[84] For q48 a response of 4 or 5=suggests teachers expect that effective use of the tablet in the classroom will require much effort; 1 or 2=suggests that teachers expect the transition will be fairly simple.

[85] For questions 41 to 47 and questions 49 and 50, a response of 4 or 5=suggests that teachers expect to be confident when using tablets for teaching ,and expect tablet use to be advantageous; 1 or 2=suggests they do not expect to be familiar with using the tablet in the classroom, and are not sure that the tablet will offer them an advantage.

Subject	Number in Group (n)	Q43 Median Will cover more content	Q43 IQR	Q45 Median Will pace more effectively	Q45 IQR
EMS	5	**4.00**	1.00	**4.00**	0.00
Maths	10	**3.50**	**1.75**	**3.50**	**1.75**
English	9	3.00	1.00	3.00	0.00
SS	7	3.00	**1.50**	3.00	**1.50**
2nd Lang	7	3.00	**2.00**	3.00	1.00
Art	4	**2.00**	0.25	**2.00**	0.50
NS	4	**2.00**	0.50	3.00	**2.25**

Table AE2: Subject teachers' accounts of Envisaged Content (q43) and Pace of Lessons (q45)[86] – Median and IQR Values

Subject	Number in Group (n)	Q44 Median Explain content more effectively	Q44 IQR	Q46 Median Motivates learners	Q46 IQR
EMS	5	4.00	0.00	4.00	0.00
English	9	4.00	1.00	4.00	1.00
SS	7	4.00	1.00	4.00	0.50
Maths	10	4.00	**1.50**	4.00	**2.00**
Art	4	3.00	0.00	3.00	**2.00**
2nd Lang	7	3.00	0.50	3.00	**2.00**
NS	4	3.00	0.50	**2.50**	**1.50**

Table AE3: Subject teachers' accounts of Envisaged Effective Explanation (q44) and Motivation of Learners (q46)[87] – Median and IQR Values

Adoption Activities (AA)

Envisaged Horizontal Adoption Activities (AA-H)

In order to assess teachers' ***envisaged*** comfort in using tablet technology for horizontal activities, the following statements were posed: (q41) *I expect that I will be confident when using tablet technology in my everyday life for my own personal needs*; (q57) *I expect that I will have to expend considerable effort to become comfortable with using tablet technology in my everyday life* and (q56) *in general I am comfortable with these new technologies*.

[86] For q43 and q45 a response of 4 or 5=suggests teachers think tablets will assist; 1 or 2=suggests they will not.
[87] For q44 and q46 a response of 4 or 5=suggests teachers think tablets will assist; 1 or 2=suggests they will not.

Subject	Number in Group (n)	Q41 Median Will be confident using tablets in everyday	Q57 Median Will have to expend considerable effort to become comfortable	Q56 Median General comfort with these new technology
EMS	5	5.00	4.00	4.00
English	9	5.00	4.00	4.00
Maths	10	4.50	2.00	4.00
SS	7	4.00	2.00	4.00
Art	4	4.00	3.00	4.00
2nd Language	7	4.00	2.00	4.00
NS	2	4.00	3.00	2.50

Table AE4: Subject teachers' accounts of Envisaged Horizontal (everyday) Adoption Activities (AA-H) (q41, q57[88], q56[89]) – Median Values

Envisaged Teaching Adoption Activities

To assess teachers' ***envisaged*** comfort with using tablets for teaching in the future, the following statement was posed: (q48) *I expect that I will have to expend considerable effort to become comfortable with using tablet technology in my current.*

Subject	Number in Group (n)	Q48 Median Will have to expend considerable effort to become comfortable in my teaching
EMS	5	5.00
English	9	4.00
NS	2	4.00
SS	7	3.00
2nd Language	7	3.00
Maths	10	2.00
Art	4	2.50

Table AE5: Subject teachers' accounts of Envisaged Teaching Adoption Activities (AA-E) (q47[90]) – Median Values

[88] For question 57 a response of 4 or 5=suggests teachers expect that in the future they will have to put in large amount of effort to be able to use the tablet; 1 or 2=suggests that envisage it will be a relatively simple transition.

[89] For question 41 and question 56, a response of 4 or 5=suggests teachers expect in the future to be comfortable with new technology, specifically the tablet; 1 or 2=suggest they will not.

[90] For question 47 a response of 4 or 5=suggests teachers expect that in the future they will have to expend large amounts of effort to become comfortable with tablets in their teaching; 1 or 2=suggests teachers do not expect that the transition to teaching with tablets, will require major effort.

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